

improve

manufacturing performance
with harmonized MES/MOM





Improve your manufacturing performance with Manufacturing Execution Systems / Manufacturing Operations Management

Atos' Manufacturing Execution Systems or Manufacturing Operations Management (MES/MOM) power progress for today's and tomorrow's discrete and process manufacturers. Systems that used to be called MES have now evolved into encompassing solutions for the shop floor: Manufacturing Operations Management (MOM) solutions.

Atos understands the challenges faced by discrete and process manufacturers. We also have deep knowledge of manufacturing processes, and the technologies needed to optimize them.

We can help you design, build and operate MES/MOM systems that provide tangible payback on your investment, and reduce risk to the business.

The right solutions from Atos will reduce inventory, liberate cash, optimize resource usage, and accelerate time-to-market. We can also help cut IT costs and overheads, by harmonizing and consolidating existing solutions from across all company plants and facilities.

People talk about a general shift towards a service-based economy - but the physical reality of our world continues to be shaped through manufacturing.



What shapes our world?

What is it that shapes the world in which we live? It is the products and materials which result from manufacturing enterprises.

Our lives are surrounded by objects and experiences which did not exist in forms that our grandparents could have recognized.

It's true for the products of discrete manufacturing: the interactive white-boards in our children's classrooms; the mobile phones they use to text us; the hybrid cars we use to collect them; the contactless credit cards for entry to the 3D cinema. And it's not only about 'high-tech' - just look at the objects around your home or workplace.

It's true too for the output of process manufacturing: for everything from medicines to cleaning products, from fizzy drinks to paints, oil and gas.

In the West, people talk about a general shift towards a service-based economy - but the physical reality of our world continues to be shaped through manufacturing - and on an increasingly global scale.

“In both discrete and process manufacturing, the pressure is on to transform complex production and supply chain data into tangible improvement and innovation. MES/MOM becomes pivotal - but the need to reshape the manufacturing IT landscape can be a bit like clearing out the loft at home. You know it needs doing.

You know that if you did it, you'd gain space and add value. But you don't even want to open that little door in the ceiling because you know what's behind it!”

Setting the pace of globalization

Manufacturers have always driven globalization. Today, globalization is central to success in all areas of manufacturing industry. Pointers to global inter-dependencies are everywhere, from consumer and industry perspectives:

Consumer perspective	Walk down the street or enter a store in Paris, Pasadena or Phnom Penh to see how global brands dominate.
	At the same time, witness the explosion in mass-customization across entire segments of production (just think 'build-to-order' in automotive).
Manufacturing perspective	Markets are global with opportunities and threats coming from every direction.
	Production networks are global with multiple owned/managed facilities often spanning continents.
	Supply chains are global with third party provision and distribution crossing almost all national boundaries.

Five business pressure points

On an increasingly open global stage, discrete and process manufacturers face distinct and unrelenting pressures:

Quality, regulation and compliance

As a manufacturer, you bear the responsibility for the product and for the environment in which it is produced. Quality is the single biggest influence on brand and reputation, and it must be guarded jealously. Regulation and compliance, though imposed from outside, underpin behavior and traceability, and must be managed consistently at every plant and facility under your control.

Cost control, cash flow and compression

It is much easier to spend money than to earn it. You must optimize efficiency right across the supply chain, driving out siloed thinking and the associated expense of sub-optimal inventory. This is not simply about reducing operational expense - it is about adding to the bottom line and to your business agility. Compressing process to make it leaner and more efficient is key to competitive advantage.

Innovation

If you don't create the future, somebody else will. Innovation is not necessarily about end products: it's about being smarter with variable run-cycles, making orders of any size profitable; about being able to synchronize prototyping with daily batch production; about the choreography of supply, and much more besides. These are the factors which become critical in accelerating time-to-market.

Growth

If continuous growth is part of your strategy (and it usually is) - you have to keep growing, whether organically or through mergers and acquisitions. Whichever approach you employ, you have to continually optimize resource and asset use, and drive standardization across your growing operational base.

Sustainability

Environmental sustainability is front-of-mind in all areas of business and commerce. Manufacturers are under particular pressure to convert reduced CO₂ emissions into balance sheet benefit. In addition, waste, waste water and energy efficiency are all improved as you make first-time-right a reality. But sustainability goes beyond environmental responsibility. It's also about social sustainability - making sure that your product meets changing societal needs, and about the economic sustainability which will keep you in business long into the future.

MES/MOM: promise and the practice

MES/MOM can make a direct contribution to meeting these business challenges. Intelligently conceived and implemented, the results can be transformational. Think of this transformation in terms of three complementary focus areas:

Manufacturing

How to ensure a common workable view of data across distributed operational and production systems. There are two primary goals here:

- ▶ **To allow people and plant to increase operational efficiency and quality by sharing relevant data from previously siloed systems and processes**
- ▶ **To provide like-for-like performance data for management across departments and sites, giving them the dashboards and KPIs they need to tune and improve operations.**

Supply chain

The supply chain must be considered as part of the extended enterprise. The more effectively that actionable information moves across the supply chain, the more opportunities you have to reduce both lead-times and inventory. This is essential for improving agility in both the volume and mix of product.

Product innovation

Manufacturing collaboration is about more than optimizing the operations and supply chain. Breaking down information silos also helps shrink time-to-market for new product development: successful product innovation must get the right data to the relevant production processes on time. Similarly, improved integration between design chain and manufacturing processes aids product innovation by delivering timely feedback on the manufacturing viability of new products.

MES/MOM first appeared in the early 1990s, conceived as a bridge between business systems and real-time production operations. Initial promise did not live up to expectations. Back then, three areas of concern stood out:

- 1. Cultural readiness - manufacturing was less agile 20 years ago, and in most industry sectors, awareness of the capabilities and benefits of MES/MOM was low.**
- 2. Business complexity - the bigger the business, the tougher it is to change.**
- 3. Technological complexity - even basic data interchange between production systems was a challenge.**

In this context, although MES/MOM promised much, these very real challenges impeded adoption: it was too complex and too resource heavy; mature MES/MOM products and specialist resources were tough to find; and, as always, continuity of operations remained the business priority.

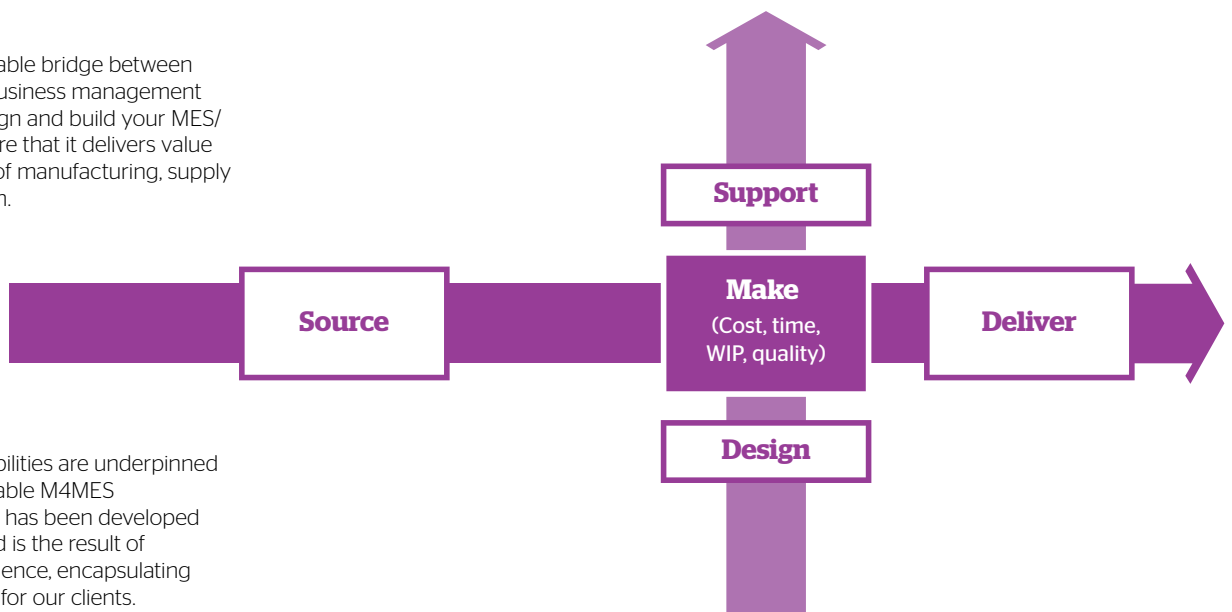
Our methodology is the result of investment and experience, encapsulating industry best practice for our clients.

The time is now

Today, Atos is positioned to help large manufacturing enterprises accelerate MES/MOM implementation. Times have changed, and forward-thinking manufacturers now understand that production and process optimization, pro-active supply chain control and continuous innovation are all business imperatives and must all be supported with advanced and dependable IT solutions.

MES/MOM is now a viable bridge between process control and business management systems. Atos will design and build your MES/MOM solution to ensure that it delivers value across the three tiers of manufacturing, supply chain and design chain.

Supply chain
(Reliability, assets & responsiveness)

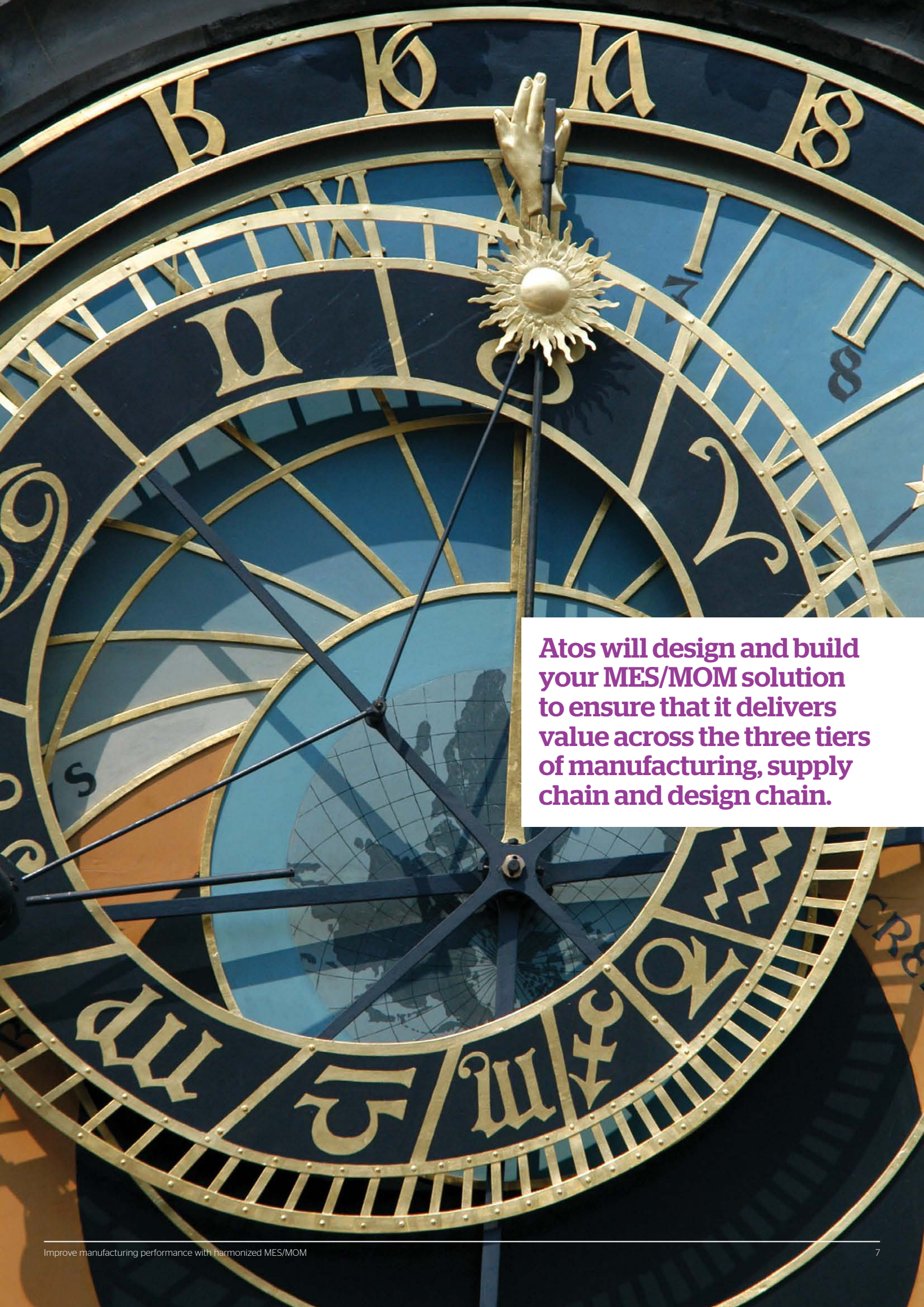


Atos' MES/MOM capabilities are underpinned by its solid and actionable M4MES methodology. M4MES has been developed by Atos specialists, and is the result of investment and experience, encapsulating industry best practice for our clients.

By definition, MES/MOM demands extensive and meticulous interfaces with both process control and business information systems. Depth of knowledge and experience in both of these very different areas is critical, and we have a demonstrable track record in both.

As a highly-experienced system integrator, Atos works fluently with the world's leading MES/MOM application specialists, helping ensure that our clients make the right choices and gain the maximum benefit.

Product lifecycle
(Time to market, agility)



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MES/MOM in action with Atos

Atos has successfully delivered more than 400 MES/MOM projects for large international manufacturing enterprises. Although benefits are naturally specific to the individual business, the overall focus on improved operations, on supply chain and innovation remains true for all our clients.

When you design and build military aircraft, managing as-designed, as-planned and as-built baselines is critical. MES/MOM is key in the design chain, providing product and process specification to production, and process traceability during and after production. For this leader in defense aviation, Atos applied its M4MES methodology to optimize specification and budgeting for the MES/MOM implementation, handling interfaces between all related ERP and PLM systems.

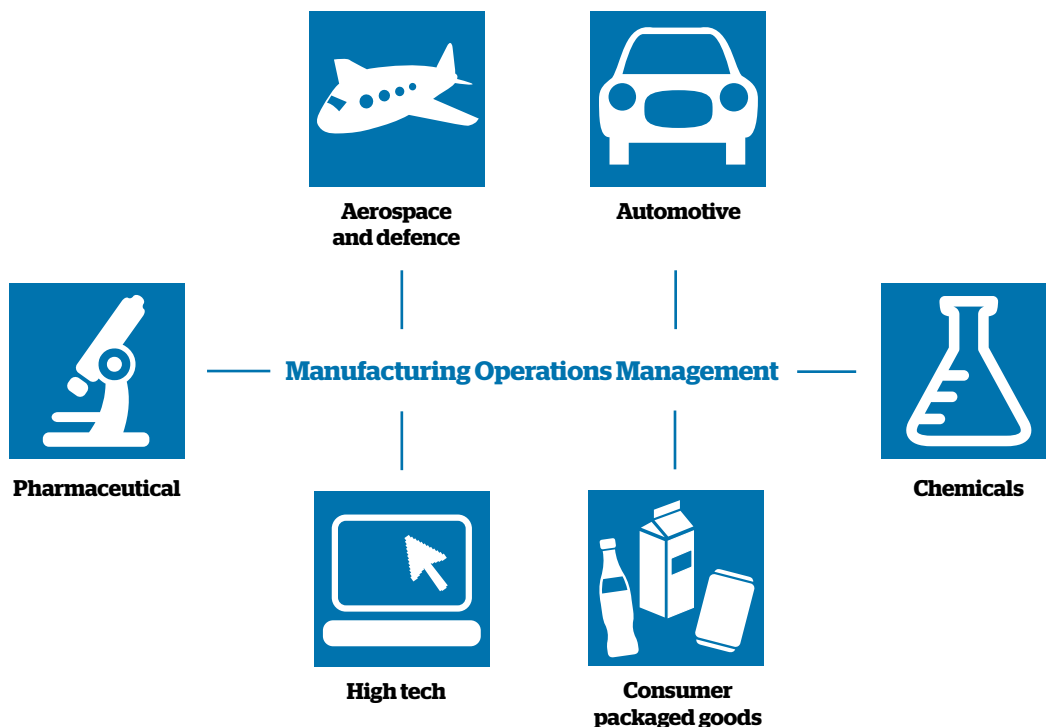
Atos helped a leading global truck manufacturer radically improve process control, work instruction authoring, visualization and traceability. Their new MES/MOM solution supports continuous process control and delivers the insight needed for empirical analysis and continuous process innovation.

A global leader in professional document management systems sought to replace its legacy MES/MOM implementation to increase production, improve quality and eliminate bottlenecks. The Atos MES/MOM solution tracks and collects process and product data, enabling critical analysis and improving quality and throughput.

This top consumer dairy brand insists on its customers getting the same taste every time. Our customer needed to track and trace millions of cheeses as they mature – and to improve throughput. Our solution contributes directly to higher yields and gives management easy access to an aggregated real-time view of production and business databases.

Laboratory testing is a critical element and significant cost in the production of veterinary medicines. The Atos MES/MOM implementation for this specialist laboratory services provider reduced cost, increased throughput, and most importantly, liberated skilled scientists from clerical drudgery.

This multi-national chemical company was paying too much for maintenance across a distribution production network, and was finding it hard to identify and exploit best-practice. The MES/MOM solution designed by Atos translated a Tower of Babel into one industrial language and allowed the client to negotiate a single support contract for the first time in its history.



How do we do it?

Atos' proposition as a partner for MES/MOM adoption hinges on two strengths:

- ▶ **Actionable M4MES methodology**
- ▶ **Depth of experience and global reach in manufacturing processes and IT.**

M4MES Methodology

There is nothing theoretical or academic about the Atos M4MES methodology for MES/MOM adoption. It provides a solid, executable framework designed to help complex manufacturing enterprises identify needs and opportunities. It allows you to pilot and experiment safely, and to schedule and implement in a way which is both repeatable and geared to continuous improvement.

Our M4MES methodology, is founded in best practice and this has clear and practical benefits for adopters: every project we undertake contributes to our library of best practice.

While paying complete respect to all issues of client confidentiality, we encourage the open exchange of ideas and experience. This contributes to our growing repository of re-usable business and IT project elements. Examples include user-requirement analysis and process best practice. The availability of these business and IT elements:

- ▶ **Accelerates and improves analysis**
- ▶ **Reduces project costs**
- ▶ **Increases reliability and reduces risk.**

We recognize the value of the many MES/MOM application specialist companies active in the open market, and seek an impartial and vendor-independent position from which to offer our clients professional guidance on the best choice.

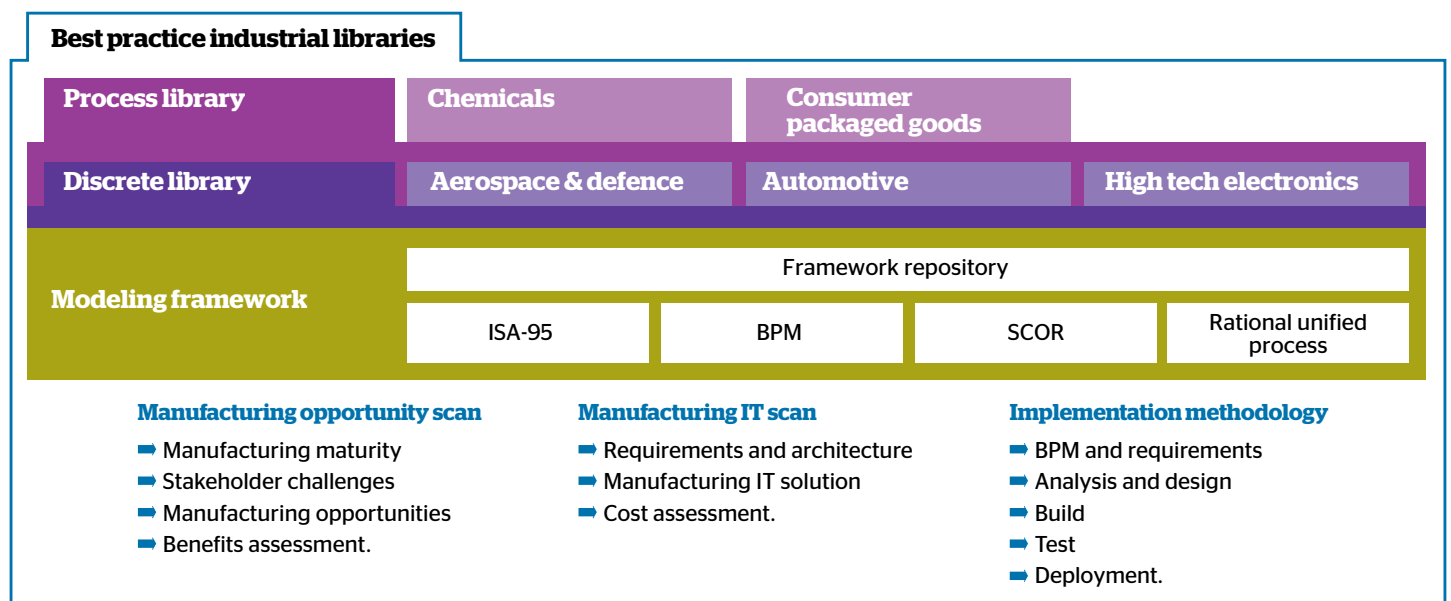
Depth of experience

MES/MOM, perhaps more so than many other industry specific areas of IT, derives its value from the ability to integrate data from multiple sources. For this reason, the extended industry knowledge of Atos becomes absolutely central to our MES/MOM proposition.

Unlike many IT solutions and services companies, our expertise extends equally into SCADA/machine control and into business information systems. We are, for example, the leading exponent of control systems for nuclear power production, on the one hand, and a regular winner of SAP innovation awards, on the other. For MES/MOM, our specialities in ERP and PLM are particularly relevant.

Overall, Atos establishes a proposition of 'design, build, operate', and this also holds true for MES/MOM, according to the needs and practices of the individual client. The massive volumes of real-time data generated by MES/MOM, for example, can be hosted, processed and managed in Atos secure, green data-centers, if desired.

Finally, Atos' position as a global player with coordinated global resources makes a critical contribution. Today's leading manufacturers operate on the global stage, and it is essential that the partners they choose are able to support MES/MOM rollouts and support at any plant and in any location.





Clear business and IT benefits

Manufacturing enterprises must achieve standardization and consistency across the extended enterprise. The ability to leverage data from both business and production systems is critical to this consistency. Ideally, you need to cookie-cut best practice with ease across plants and continents.

By selecting Atos as a partner for MES/MOM adoption, manufacturing companies gain a practicable approach to data aggregation across their own enterprises, and most importantly, from across the supply chain. This aggregation is the foundation of process optimization. These engagements are extremely focused: nobody wants (or is prepared to pay for) mega-projects.

Because Atos brings the skills and its M4MES methodology needed to layer MES/MOM across existing production and business systems, our clients' own IT teams are not over-stretched by these initiatives.

Atos is experienced in both the technical and human implications of MES/MOM adoption. We will ensure that the change is welcomed from the shop floor to the board room, and that business benefits are understood by all.

Because of Atos' experience in both business and IT best practice, our manufacturing clients gain:

- ▶ **The business advantage of MES/MOM - optimized and consistent processes across manufacturing operations and the supply chain**
- ▶ **Accelerated design, execution and management of MES/MOM projects with minimized risk.**

Cost reduction targets	
Processes	Production KPIs
Quality	3% to 7% yield increase
	150K to 3M less scrapped materials
	2% less process defects
Regulatory performance	25% to 7% less signature review times
	30% to 50% less exception handling time
Lead time	58% less idle time
	8% to 18% productivity increase
	15% to 50% less cycle time
	20% less changeovers
WIP and inventory	20% to 50% less WIP
Revenue opportunity targets	
Customer service	5% more schedule attainment
	10% more on-time delivery
New product introduction	50% shorter NPI cycle

Next steps

The ability to make engagement easy is at the core of our business ethos. We design practical steps to adoption with measurable return at every stage. Because the extended and consistent adoption of MES/MOM across the manufacturing enterprise has such a direct impact on business performance, it is important that key business and IT decision-makers understand its potential.

Atos offers compact introductory sessions to MES/MOM designed for non-IT specialists, and we are happy to arrange these at your convenience. Practical outcomes are important, and an MES/MOM Opportunity Scan will provide a clear framework for your subsequent business decisions.

Success will depend on close partnership between your IT experts and our own, and we offer a series of MES/MOM engagement options for a more technical audience. Recently, our Manufacturing IT Scan and Manufacturing IT Roadmap sessions have been proving hot items.

Whichever path you choose, we will follow through with substantiated proposals, and low-risk opportunities to experiment and explore. Over 50% of our manufacturing clients are already actively engaged in MES/MOM.

About Atos

Atos is an international information technology services company with annual 2011 pro forma revenue of EUR 8.5 billion and 74,000 employees in 48 countries. Serving a global client base, it delivers hi-tech transactional services, consulting and technology services, systems integration and managed services. With its deep technology expertise and industry knowledge, it works with clients across the following market sectors: Manufacturing, Retail, Services; Public, Health & Transports; Financial Services; Telecoms, Media & Technology; Energy & Utilities.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. It is the Worldwide Information Technology Partner for the Olympic and Paralympic Games and is quoted on the Paris Eurolist Market. Atos operates under the brands Atos, Atos Consulting & Technology Services, Atos Worldline and Atos Worldgrid. For more information, visit: atos.net

For more information, contact: dialogue@atos.net

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