



DIGITAL INDUSTRIES SOFTWARE

Opcenter X boosts SMB digital manufacturing

Transform your business by using SaaS-based modular manufacturing software

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A new approach to manufacturing operations management (MOM) greatly expands access to powerful digital manufacturing tools for small- and medium-sized businesses (SMBs) like yours. For the growing number of SMB manufacturers that are facing an existential imperative to digitalize their manufacturing operations, this access is a welcome opportunity for SMB manufacturers. For most such companies, managing today's product and process complexity, disruptive technologies, supply chain volatility and tightening margins with paper-based, spreadsheet or home-grown solutions is or soon will be unworkable.

This ebook describes the urgent need and great value provided by a modular MOM solution. Modular MOM empowers companies with constrained capital and limited information technology (IT) and human resources to develop and execute a clear digitalization strategy for their manufacturing operations.

Siemens Digital Industries Software is pioneering modular MOM, enabling more manufacturers to take a step-wise approach to digital transformation. Built with cloud technologies and offered as software as a service (SaaS), using Opcenter™ X software lowers the time and

cost barriers for SMBs, enabling you to realize rapid return-on-investment (ROI) with modules that connect and adapt as your enterprise matures. Opcenter is part of the Siemens Xcelerator business platform of software, hardware and services.



The digital manufacturing landscape is changing

Digital transformation has become essential for your SMB manufacturing enterprise to stay ahead in today's fast-moving and disruptive business environment. It provides a pathway for you to improve your operations, create new business models and generate new revenue streams – outcomes that are urgently needed.

Today's manufacturing marketplace is formidable. Your company may face an escalating pace of new product introductions (NPIs), increasing calls for customization, demand for higher quality, transitions to sustainable materials and processes, more stringent regulations, a rapidly growing number of product variations and configurations, tightening margins, volatile supply chains, etc.

As manufacturing engineers contend with these demands, they are nearing the limit of what they can accomplish with paper-based, spreadsheet and home-grown management systems. They need a digital solution designed specifically to manage production operations: MOM software. A MOM solution represents an evolution and extension of the traditional manufacturing execution system (MES), managing not only execution but also production planning and scheduling, quality and manufacturing intelligence/data analytics.

The time is ripe for SMB manufacturers to achieve digital transformation using a MOM solution, which can give your company a considerable advantage over the competition. After all, many SMBs are not addressing their transformation needs more aggressively because they fear a high cost of failure, which can be devastating to their business. This fear is based in part on a belief that the upfront investment required for digital transformation is prohibitive and risky. But this is no longer the case.

The digital manufacturing landscape is changing for the better, and at just the right time. As an innovative departure from a standard MOM platform, modular MOM lowers both the costs and the risks associated with digital transformation. The Opcenter X modular MOM solution brings together the advantages of digital manufacturing with the advantages of SaaS cloud solutions. The benefits of SaaS include reduced time-to-market, the ability to start small and scale fast, ease of use and lower costs, flexibility and up-to-date functionality.

Let's explore the value of modular MOM and the advantages of a SaaS "pay as you grow" approach to digital transformation for your company.



What a MOM digital transformation offers your business

How will your company continue to build and deliver high-quality products on time and at optimal cost? How will you do so while meeting new market demands? You must:

- Build both innovation and the ability to handle variants into your product portfolio
- Achieve and demonstrate compliance with regulations that continue to evolve and grow in volume
- Keep supply chain volatility from slowing production throughput
- Remain profitable despite tightening margins

The good news is these are precisely the challenges a MOM solution is designed to overcome. Using MOM systems enable you to optimize manufacturing processes, reduce costs and ensure consistent product quality, all while automatically tracing and documenting everything.

A MOM solution is comprised of the digital engine that coordinates product design and manufacturing engineering and planning with manufacturing execution. It connects systems so they share the same data by using a comprehensive digital twin and a common digital backbone, which together maintain end-to-end digital manufacturing continuity.

Why is this data-driven continuity so valuable for manufacturers? It enables cross-domain collaboration, breaking down silos and accelerating innovation and NPI. It also means you will be able to make better decisions faster as you execute production orders, operations sequencing and work-in-process (WIPs) based directly on manufacturing process plans.

A MOM solution's data-driven MES orchestrates factory operations by communicating design and engineering data to shop floor systems, including the industrial internet of things (IIoT), automation supervision (SCADA) and edge devices that control automated equipment. It generates up-to-date electronic work instructions (EWIs), too, so your operators perform the right task at the right time with the right materials and equipment, guaranteed by digital continuity.

MOM software also connects quality management directly to design and engineering data, better ensuring that execution meets product specifications and customer/regulatory requirements. Additionally, it makes nonconformance tracking and corrections transparent and traceable.

By providing shop floor visibility that enables realtime adjustments and fixes to equipment, processes and WIPs, and by generating predictive insights that support realtime corrective actions, a MOM solution helps to minimize rework and scrap. And it supports closed loop continual process improvements.

With the great value that MOM software offers, the next question for SMB manufacturers is how to acquire these capabilities for your operations. That's where Opcenter X comes in.



Pay-as-you-grow manufacturing digitalization

A MOM solution will enable your company to improve manufacturing productivity, product quality, profitability, time-to-market and compliance. But to move MOM software from aspirational to a realizable goal for your SMB, it is important to move beyond the fear of the high cost of failure and that a MOM investment is cost-prohibitive and too risky.

Using Opcenter X modular MOM provides this relief. The Opcenter X solution is architected to enable a stepwise approach to digital transformation. Built with cloud technologies, using Opcenter X lowers the time and cost barrier to MOM capabilities. You can realize rapid ROI with modules that connect and adapt as your digital enterprise matures. The key to this new MOM model is its pay-as-you-grow approach to digitalization.

Pay-as-you-grow allows users to strategically allocate, scale and customize their computing resources, including software, storage and development platforms. With its SaaS framework, pay-as-you-grow enables resilience and efficiency to help you find the right solutions faster. It also removes operational complexity, allowing you to explore innovative solutions, perform proof of concept or adopt new technologies more affordably. You can try out software services or deploy them for short-term projects without committing to long-term agreements.

Pay-as-you-grow SaaS offers unprecedented scalability that aligns well with the dynamic needs of SMBs. It allows you to adjust your software usage based on your growth or streamlining efforts, ensuring optimal resource use and cost optimization. Importantly, SaaS provides all

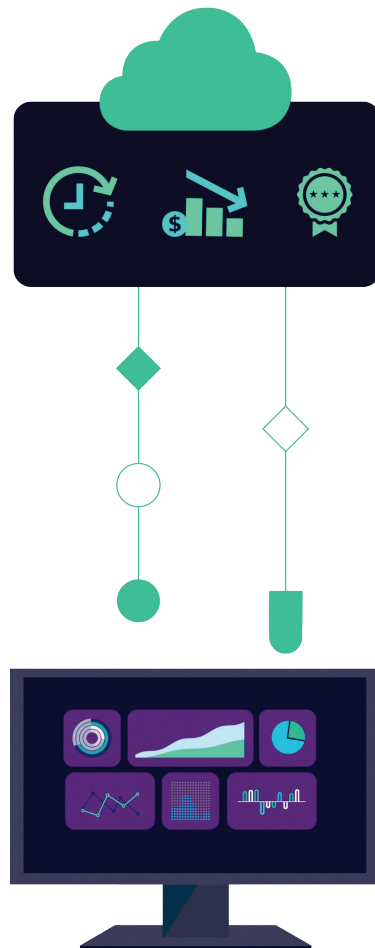
stakeholders with access to the latest functionality and up-to-date features.

The SaaS model also keeps you prepared to integrate new businesses and products, reserving the necessary resources and the ability to invest in the sales force and business development. It fosters cost-efficiency, especially for startups and small businesses, as it eliminates the need for significant up-front investments or commitment to extensive long-term contracts.

Lastly, the pay-as-you-grow model provides clear cost visibility, making budgeting and forecasting easier based on usage patterns, giving you better control over your IT spending. You pay only for the services you consume.



The modular MOM concept



Siemens has pioneered modular MOM in Opcenter X for the express purpose of accelerating digital transformation on SMB manufacturing floors. We accomplish this by integrating modules that allow companies to start small and achieve rapid ROI that increases over time. To make sure modular MOM fulfills its design intent, Siemens developed not just modularity and but other essential capabilities of the software.

Configurability: This enables you to turn on new functionality without new integration or customization requirements. This configurable software architecture empowers MOM users to tailor the functionality they need to the specific roles of their manufacturing operations.

Extensibility: Each MOM modular application can add new functionality as your digitalization footprint expands. You can easily add new modules because Siemens designed them to speak to your existing modules and adapt to your unique manufacturing models.

Modularity: When MOM is made up of distinct functional units, users may assemble and reassemble their MOM configuration at will.

Application communications: Modules within your MOM configuration are designed to communicate with each using cloud technologies. They can also communicate with external applications via standard protocols.

Multitenancy: The Opcenter X cloud architecture allows for sharing computing resources as well as common code bases, enabling efficiencies in deployment, upgrade and maintenance.

Security: Modular MOM provides security to make sure customer data remains separated from any shared cloud elements and safe from cybersecurity threats.

Top-down design/personalization: Modular MOM allows you to connect data sets and applications to create new business processes across disciplines. This capability is supported by rapid application development or low-code/no-code systems. We detail low-code capabilities below.

With these capabilities, using Opcenter X transforms MOM technology into a rich collection of purposebuilt modules. They can run standalone or interconnected to deliver customer apps and solutions, which are easy to configure and extend.

Low-code citizen developers can customize Opcenter X

To optimize the efficiency of every stakeholder using Opcenter X, it allows each person (or group of people on the same team) to create individualized user experiences (UXs). Any data and resources connected to your MOM system that relate to a stakeholder's specific responsibilities can be made instantly visible and accessible to that person. A personalized UX lets users easily access the information they need and remove the clutter of extraneous data, enabling them to quickly comprehend each task and perform their jobs with the utmost efficiency – regardless of the information source.

Providing such personalized UXs in the past has required complex and time-consuming software development activities by highly skilled frontend developers. But today you can empower your workforce to become citizen developers who tailor the applications they use to their individual needs. These citizen developers can access uncomplicated applications and automate business processes without any coding experience.



A strong partner network supports you regardless of location



Supported by our trusted partners, our modularized software for manufacturing operations management provides a comprehensive solution to streamline and perfect your manufacturing processes, offering a range of apps and microservices that can be customized to meet your needs. Our solutions cover all aspects of manufacturing operations, from production scheduling to production management and quality control.

Our partners supply expertise, support and resources to help you get the most out of our software. We have carefully selected and vetted our partners, ensuring they are industry experts who share our commitment to delivering high-quality solutions and excellent customer service.

With our modularized software and partner support, you can optimize your production processes, reduce downtime and increase efficiency, productivity and quality. Our software provides real-time data and analytics, enabling you to make informed decisions and identify areas for improvement.

Our software can be easily integrated with your existing systems, minimizing disruption to your operations. With our partner support, you have access to the resources and expertise to help you get the most out of our software.

Supported by our partner network, Opcenter X is a cost-effective solution that provides a significant return-on-investment (ROI) for your business. It delivers a wealth of benefits such as ease of use, rapid deployment, a flexible user interface and minimal investment in IT. It is also platform agnostic and will run on any device.

In short, the Opcenter X cloud native platform's simple tools empower your workforce to quickly realize their ideas.

Ultimately, using Opcenter X allows you to transform your division of labor, reducing the number of projects sent to IT specialists and giving your workforce more freedom to improve their user experience and work efficiency. This is all supported by Siemens.



Benefits of adopting Opcenter X

In most manufacturing companies, leadership is looking across the enterprise for ways to accelerate their digitalization strategy. With the stepwise approach to digital transformation afforded by modular MOM, each incremental MOM initiative you undertake can propel the company forward. You will be able to target high-impact areas for quick gains in your early MOM initiatives. Greater productivity, lower operating costs, higher quality, easier and greater compliance, reduced time-to-market and/or increased profitability generated by one initiative can motivate and fund the next.



Siemens anticipates Opcenter X customers can realize the following benefits:

- Improved traceability with reduced paper usage (potentially a completely paperless shop floor)
- Dependable management of your MOM system without the expense of maintenance or internal IT specialists
- Easy solution extension – just select the needed app
- A fully integrated system replacing multiple siloed standalone systems, many of them paper-based or homegrown
- Mobile capabilities, with SaaS apps easily communicated to portable devices
- Rapid commissioning with no debugging tasks
- Easy integration with upstream enterprise and downstream shop floor systems

With Siemens as your MOM solution partner, you can be sure Opcenter X is built on a rich and deep knowledge base and the extensive capabilities of a leading software company. We listen to and learn from our customers, then innovate and capture best practices for every digital task. Then we apply best practices to accelerate time-to-value of our software.

With Siemens as your software partner, implementing modular MOM capabilities by using Opcenter X will bring about the manufacturing agility you need to thrive in your manufacturing space, both today and into the future.

Siemens Digital Industries Software helps organizations of all sizes digitally transform using software, hardware and services from the Siemens Xcelerator business platform. Siemens' software and the comprehensive digital twin enable companies to optimize their design, engineering and manufacturing processes to turn today's ideas into the sustainable products of the future. From chips to entire systems, from product to process, across all industries, [Siemens Digital Industries Software](#) – Accelerating transformation.

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