

ERP AND THE DIGITIZATION OF **INDUSTRIAL MACHINERY MANUFACTURING**



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ERP FOR
INDUSTRIAL MACHINERY

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DELIVERING VALUE AND DRIVING INNOVATION THROUGH SUPERIOR PROCESSES

The proliferation of digital technologies is disrupting business models across industry sectors. Perhaps few industries will be transformed as thoroughly as industrial machinery manufacturing, where new digital innovations are transforming organizational structures, production processes and even entire value chains. Not only must the right products be delivered to the right person for the right price, the process of how products are designed and delivered must be elevated to a new level of sophistication.

While Industry 3.0 focused on the automation of single machines and processes, Industry 4.0 calls for a future of agile, modern technology enablers such as the Internet of Things (IoT), cloud computing, mobile devices and big data. Meanwhile, advances in connected devices, machine learning, artificial intelligence, and 3D printing are all opening the gates to digital disruption.

In the coming decade, next-level interfaces will enable industrial machinery manufacturers to connect physical assets by a “digital thread”—unleashing a seamless flow of data across the value chain. This end-to-end integration of data and systems will allow manufacturers to link every phase of the product life cycle, from design testing, and production to distribution, point of sale, and use.

Several major disrupting factors are poised to have the greatest impact on the manufacturing model of the future. Following are four breakthrough trends that are already driving much of the change.





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"Fundamental developments in market patterns and technology will have a significant impact on the machinery industry. Players' ability to thrive amidst the change will depend, in large part, on their capacity to build agile organizations that can adapt to the shifts in the spaces and places of growth."

Source:

How to succeed: Shifting growth patterns, increasing pace of digitization, and organizational change. McKinsey & Company, Inc.

THE INFUSION OF THE INTERNET OF THINGS

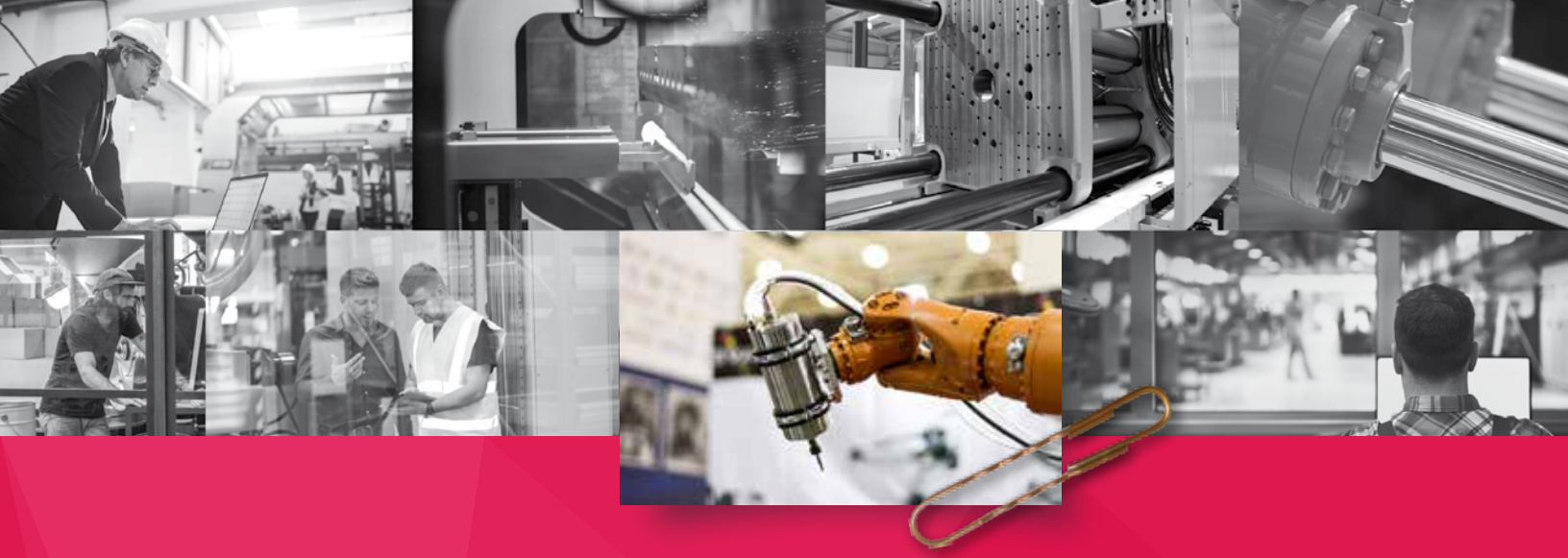
At the center of digital disruption is the Internet of Things (IoT), which provides industrial machinery manufacturers with an effective way to connect products, devices, and machines to enable new levels of information monitoring, collection and analysis. On production lines, this is accomplished with sensors detecting and recording a range of measurements, such as the volume of raw materials coming in, as well as the subsequent manufactured products moving through the plant.

Meanwhile, the trend of mass customization is requiring greater manufacturing agility to meet shifting customer demands. Mobilization and connectedness—leveraged through the IoT—is helping to address these challenges by enabling more effective after-sales service and support. Data collected from connected devices, for example, can be translated into insights that help improve product quality, optimize performance and extend lifecycles.

IoT-enabled equipment improves production efficiency and allows for a smarter way of doing business. Digitizing the flow of products provides managers with a precise overview of what materials are used and the time it takes in the production process, as well insight into where they can cut costs and anticipate future needs.

As industrial machinery manufacturers adapt their equipment to the IoT world, they should first determine precisely what data is most valuable to collect, as well as gauge the effectiveness of the analytical structures that will be used to assess the data. In addition, next-generation equipment will require a diverse mix of workers, which should include engineers who can design and build IoT products, as well as data scientists who can analyze output.





The **next generation of IoT technology** is expected to go well-beyond real-time monitoring to connected information platforms that leverage data and advanced analytics to **deliver higher-quality, more durable, and more reliable products.**

**IN FIVE YEARS,
85 PERCENT OF THE
MACHINE AND PLANT
MANUFACTURERS
WILL HAVE DIGITIZED
THEIR VALUE-ADDED
CHAIN.**

Source: Strategy& / PwC, Industry 4.0 - Chances and challenges of the 4th industrial revolution

DRIVING INNOVATION WITH 3D PRINTING

3D printing, also known as additive manufacturing, produces solid objects from digital designs by applying numerous layers of resin, plastic, or other materials in a precisely defined shape. Today 3D printing uses variety of materials like sugar, nylon, human cells, and metallic powder to print anything from prosthetic limbs and automotive parts to military weapons and cell phone displays.

Early adopters are using 3D printing to produce parts in small lots for product prototypes, helping to reduce manufacturing cycle times and cut production costs. Though still in its infancy, industrial machinery manufacturers can apply 3D printing technology to the product development and prototyping process, where its agility and speed can propel innovation and help accelerate time-to-

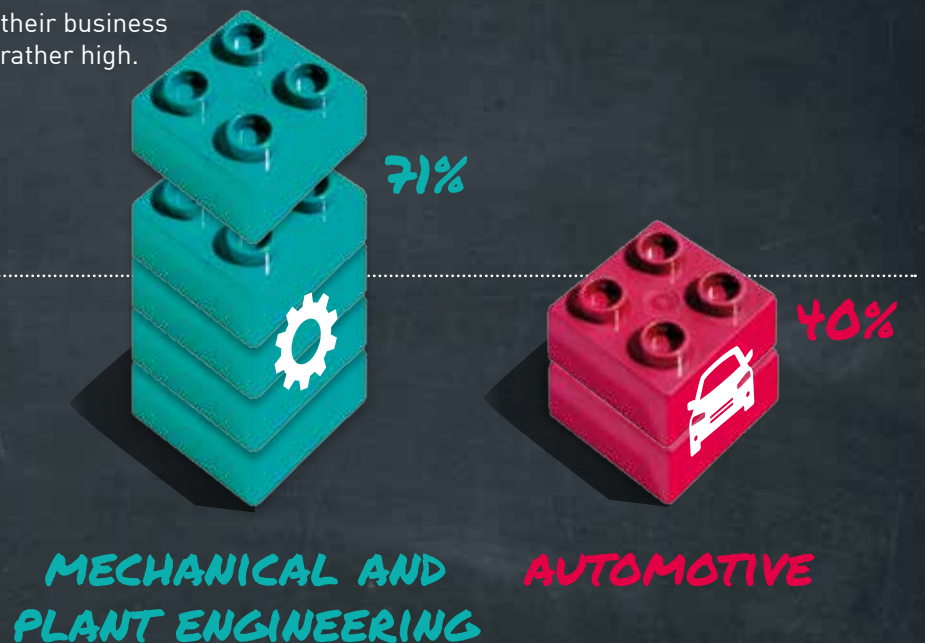
market. The next step could be to use 3D printing to make specialized, minimal-volume components that are pieces or subassemblies of finished products, or to create tools for the casting, molding, or forming of products.

3D printing could also play an important role in helping to replace today's centrally organized supply chains with decentralized supply chains comprised of many, small-scale producers. For example, by shipping CAD data from a buyer to any number of 3D printers close to the point of use, a manufacturer could eliminate long-distance shipping, logistics, and warehousing. This more agile approach could both reduce inventory while increasing customization, especially for locally targeted markets.

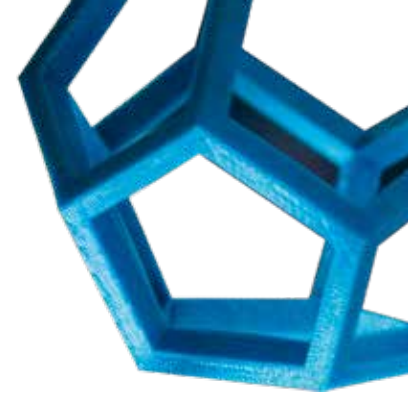
A SHIFT IN INDUSTRIAL MACHINERY

Every company considers the probability that in the next ten years new competitors will challenge their business with digitization innovations to be high or rather high.

**53 % AVERAGE
(ALL INDUSTRIES)**



Source: STAUFEN – German Industry 4.0 Index



IN THE INDUSTRIAL MACHINERY FACTORY OF THE FUTURE:

#1

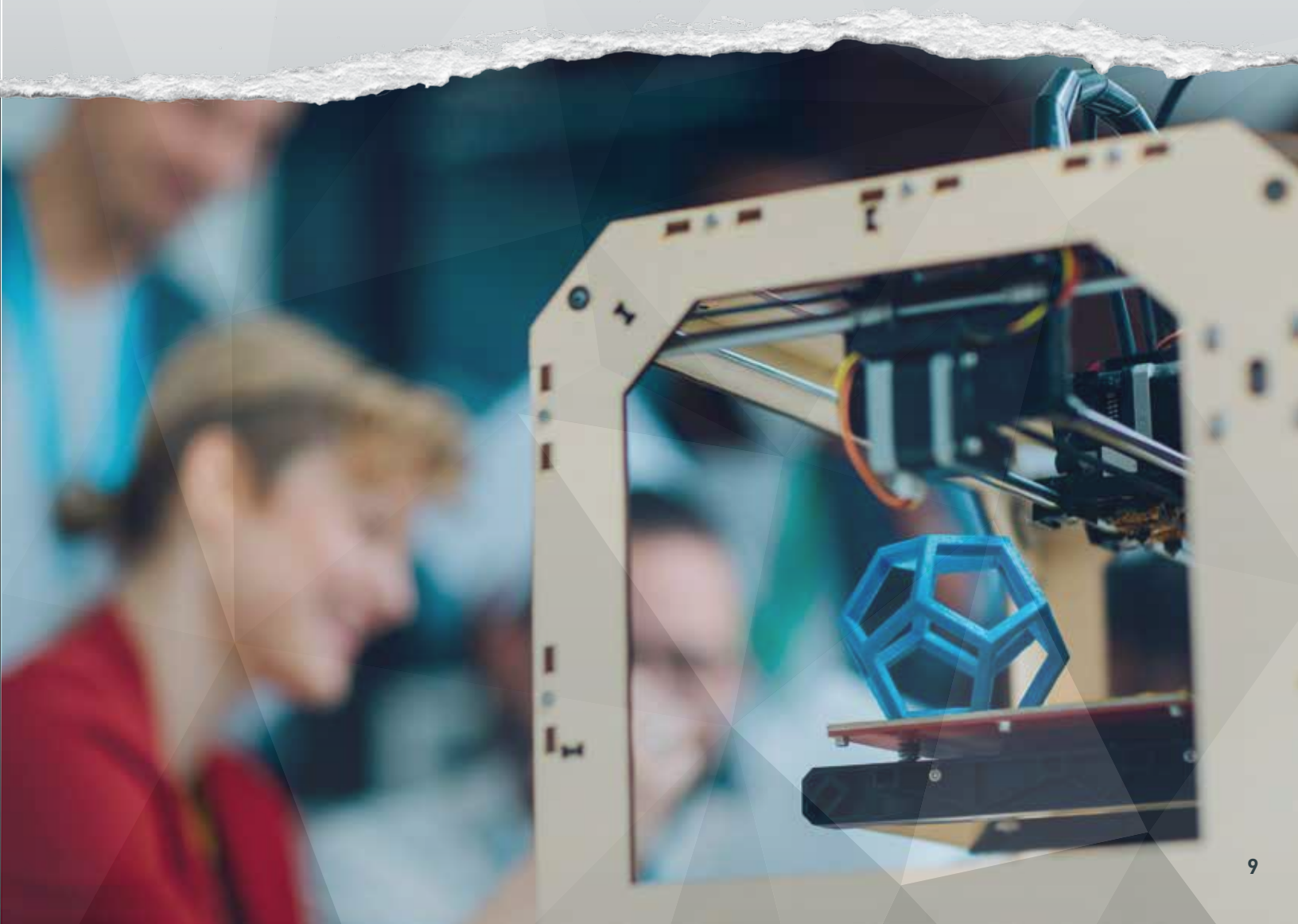
All internal and external activities are connected through the same information platform.

#2

Customers, designers, and operators will share information on everything.

#3

Assembly lines will output highly personalized products, sometimes in a lot size of one, that contain zero defects.



BUILDING A CONNECTED ENTERPRISE

Industrial machinery manufacturers today employ a multitude of different systems (including on premise and on the cloud) that perform critical functions. Integrating data and services across these systems is critical for organizations to successfully execute their digital strategies.

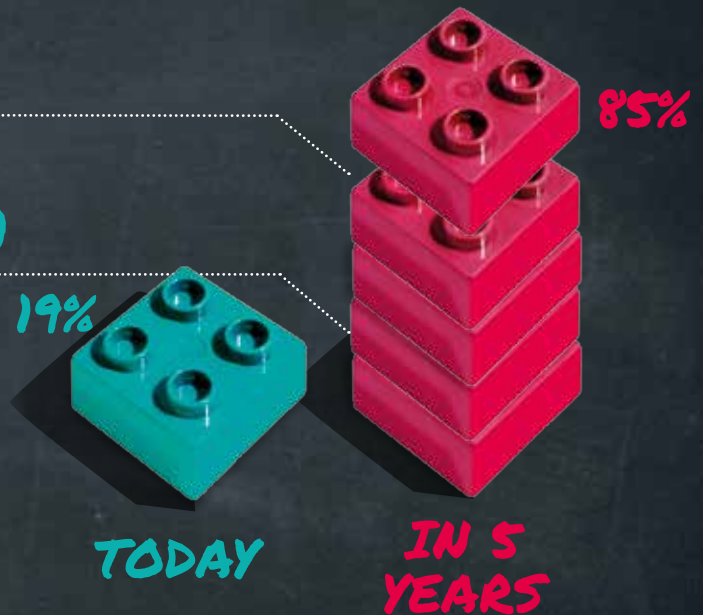
Given today's cutting-edge technologies, it's reasonable to envision a data-driven factory of the future where all internal and external activities are connected through the same information platform. Customers, designers and operators will share information throughout the lifecycle; production workers will access materials on demand and rely on virtual work instructions presented at the point of use; and assembly lines will produce highly personalized products, sometimes in a lot size of one, with zero defects.

DIGITIZATION LEVEL OF VALUE-ADDED CHAIN

In five years 85 % of the machine and plant manufacturers will have digitized their value-added chain.

83% AVERAGE (ALL INDUSTRIES)

22% AVERAGE (ALL INDUSTRIES)



Source: Strategy& / PwC, Industry 4.0 - Chances and challenges of the 4th industrial revolution

A NUMBER OF FACTORS ARE INFLUENCING HOW COMPANIES APPROACH INTEGRATION.

CLOUD AND SAAS

Organizations today realize that the cloud is here for the long-term. They are deeply invested in software-as-a-service (SaaS) applications and cloud services, and all these services need to be integrated together, as well as with business systems running within their data centers.

GREATER DATA USAGE

Companies today have a greater interest in exposing back office data, such as sales and logistics data, across the enterprise. They are also sharing data with an increasing number of IoT devices.

INCREASED COLLABORATION

Businesses today operate in a collaborative global market. No organization can stand alone and expect to thrive. They often need to integrate with third parties, including suppliers and partners. And the products they create may need to integrate with other organizations.

TIME SETUP

Time in Setup

00:58:23

Time in Setup Job / Shift

00:58:23 / 00:59:57

RUNNING

Time in Running

01:51:33

Time in Running Job / Shift

01:51:33 / 01:58:00

ADOPTING A MODERN MANUFACTURING APPROACH

Because of the complexity and mission-critical nature of industrial machinery manufacturing processes, modernizing IT operations must be a central component of the company's digital strategy. Muddling along with outdated software, manual systems and inferior tools is a direct route to obsolescence.

The manufacturing model of the future offers unprecedented opportunities for success, but the path forward also brings many challenges. Implementing digital capabilities requires robust business processes, a keen focus on the customer, and the ability to work across functional and geographic silos.

A smart first step toward the factory of the future is upgrading to a modern enterprise resource planning (ERP) system—one that is ready to adapt and can meet the demands of the journey. This is where agile information platforms shine—ones that can bridge the gap between high performance and minimum operating costs.

An attractive acquisition price is not enough for dynamic markets like industrial machinery manufacturing. To take advantage of the opportunities presented by the digital era, manufacturers need an ERP architecture that is up to the task. Monolithic mega suites will be replaced by agile, adaptable application infrastructures; focus will shift to the flexible integration of new systems and technologies.

For this reason, experts expect the cloud to be the only sustainable infrastructure for the factory of the future. With cloud-based ERP solutions, companies avoid investing in expensive technical hardware and using a SaaS model increases liquidity. Important processes such as data synchronization, software updates, maintenance, and backups are monitored and performed by the provider automatically—a significant workload reduction.



REAPING THE BENEFITS OF INTEGRATED APPLICATIONS

In today's dynamic industrial machinery production environment, unobstructed access to all relevant data is more important than ever. Particularly important are ERP capabilities that can integrate data and service across the value chain, allowing organizations to:

- Improve visibility. Rather than data sitting in functional silos across the business, a modern ERP solution provides visibility of key performance metrics across the entire organization. This insight improves decision-making and helps ensure optimum resource utilization.
- Mitigate risks. An integrated information platform enables more effective management of access permissions, helping to ensure that only the appropriate staff can take particular actions. Enhanced visibility also provides better financial controls and improves risk management processes.
- Support growth. A scalable and robust ERP platform provides a solid foundation for future growth. Not only are current business activities well-supported, but additional functionality can be brought on-line as required with new modules. As transaction volumes grow, businesses have confidence in their ability to readily scale to support it.
- Streamline logistics. The more cross-functional connections a manufacturer can make across the enterprise, the more value it can gain from digital technology. Engineers, for example, can learn more about the performance of installed equipment if they can access information and glean meaningful insights from it. Placing that data in a shared cloud can also improve collaboration with suppliers and, in some cases, increase the potential for meaningful connections with customers.



BUILDING YOUR FUTURE ON A SOLID FOUNDATION OF ERP

THE DIGITAL ERA PRESENTS INDUSTRIAL MACHINERY MANUFACTURERS WITH A GOLDEN OPPORTUNITY TO JUMP START GROWTH. THEY CAN LEVERAGE MODERN TECHNOLOGIES AND PLATFORMS, INCLUDING ERP, IN ORDER TO BETTER ALIGN WITH CUSTOMERS, OPTIMIZE THEIR USE OF SENSORS AND DATA, AND STREAMLINE ACTIVITIES. END-TO-END VISIBILITY THROUGHOUT THE ORGANIZATION—AND TO THE EXTENDED VALUE CHAIN—PROVIDES ONE OF THE MOST SIGNIFICANT OPPORTUNITIES, AND ERP IS THE BEST WAY TO GET THERE.

ABAS ERP SOFTWARE IS DESIGNED FOR INDUSTRIAL MACHINERY MANUFACTURERS

MODERN MECHANICAL AND PLANT MANUFACTURERS ARE PROJECT CHAMPIONS

Industrial machinery is faced with the task of strengthening its USPs, established over decades, and linking them to innovative technologies and modern IT. To exploit the savings and improvement potential, industry-specific ERP solutions like the ERP for industrial machinery are transformed into the complex data hub of the smart factory. Move your processes into a precise functioning gear!



**"ABAS IS CONTINUOUSLY
UPDATING THE SOFTWARE,
AS OPPOSED TO OTHER
VENDORS WHICH AREN'T,
INVESTING IN TECHNOLOGIES
LIKE CLOUD, MOBILE
AND IOT."**

Edward Langston
General Manager, Multiwall Division
Langston Companies, Inc.

THE 8 QUESTIONS INDUSTRIAL MACHINERY MANUFACTURERS SHOULD ASK WHEN SELECTING AN ERP SYSTEM

#1 WILL THIS ERP SYSTEM WORK IN A MAKE-TO-ORDER ENVIRONMENT?

Industrial machinery manufacturing is not an industry of mass production. Each order may be designed according to unique customer specifications. As such, these manufacturers require flexibility to adjust build configurations as needed and plan ahead for variance in demand. Industrial machinery manufacturers require flexibility to adjust build configurations as needed and plan ahead for variance in demand.

#2 CAN IT PROVIDE DETAILED OR SUMMARIZED COST ESTIMATES?

Large, complex builds could consist of several separate work orders or even separate sales orders and quotes. Compartmentalizing a project in this way allows manufacturers to achieve greater depth and granularity, but it can easily confuse matters when stakeholders attempt to estimate a project's total cost. The right ERP system will draw from relevant data on labor, materials and ancillary services to create an accurate, timely snapshot of total costs. With that said, users will still want the ability to dig into the build requirements of specific segments of a project, so ERP software shouldn't sacrifice one type of visibility for the other.

#3 DOES IT SHARE AND INTEGRATE DATA?

Communication with outside partners is integral to an efficient custom build. Customers and vendors contribute information as much as they expect information from the manufacturer in return. The best ERP systems honor and facilitate the give-and-take relationship of collaboration through customer and vendor portals. If manufacturers source materials or receive third-party services, those vendors can use web-accessible vendor portals to respond to Requests for Proposal and discuss quotes. Data compiled in these portals then automatically feeds into integrated ERP systems for easy recordkeeping and utilization.

#4 CAN I SCHEDULE MY WORKFORCE INTELLIGENTLY?

In an industry like industrial machinery manufacturing where demand ebbs and flows, proactive workforce management can save businesses some serious operating expenses, especially if those companies first achieve visibility into upcoming demand through an Opportunity/Quote Pipeline Infosystem integrated seamlessly into their ERP.

#5 IS THIS A GLOBAL ERP SYSTEM?

As manufacturing competition challenges manufacturers to extend their reach beyond their borders, nothing should stand in the way of globalized supply chains or valuable customer bases halfway around the world. That includes ERP systems.

Instead, ERP ought to assist manufacturers as they run multisite operations and develop frictionless processes that support robust international trade. On a basic level, users must be able to change the ERP interface to display in their preferred languages and account in local currencies not only internally but externally through customer or vendor portals.

Furthermore, no multisite ERP is complete without some form of cloud functionality, be it through a fully SaaS offering or as a hybrid cloud/native system. Click here to learn more about how cloud ERP keeps hub-and-spoke manufacturing operations connected.

#6 WILL IT LET ME STANDARDIZE PROCESSES?

Complex products demand lean manufacturing practices and quality control built into production, not to mention an ERP system underpinning these highly regulated operations. Business Process Management, an essential ERP module for industrial machinery manufacturers, visualizes workflows and guides employees through standard work instructions and documenting step by step so no important detail gets missed. BPM should be detailed enough to help manufacturers adhere to ISO requirements but also intuitive enough to allow for simple procedural changes that support a continuous improvement mindset.

#7 WILL IT INTEGRATE WITH CAD?

Manufacturing and design engineers love ERP software if it cooperates with CAD programs - and frankly, ERP software developers love it, too. Why? Because when ERP and CAD speak the same language, people spend less time plugging data into spreadsheets and fussing over unaccounted build materials. More importantly, sales orders move from planning to the manufacturing floor a lot faster with a smooth CAD integration.

#8 WILL IT EMPOWER MY SERVICE AND REPAIR TEAMS?

Manufacturers invest significant capital into their equipment, but many forget to devote equal measure to the management of service to their customer over the product life cycle. An ERP system equipped with a robust service/repair module can act as a centralized hub for tracking warranties while scheduling and facilitating maintenance calls. And with mobile app ERP functionality, users can leverage the software as an on-the-go service processing tool that travels with them wherever mechanical servicing takes place.

RUNNING

Time in Running

01:51:33

Time in Running Job / Shift

01:51:33 / 01:58:18

PLANNED

Time in Planned Downtime

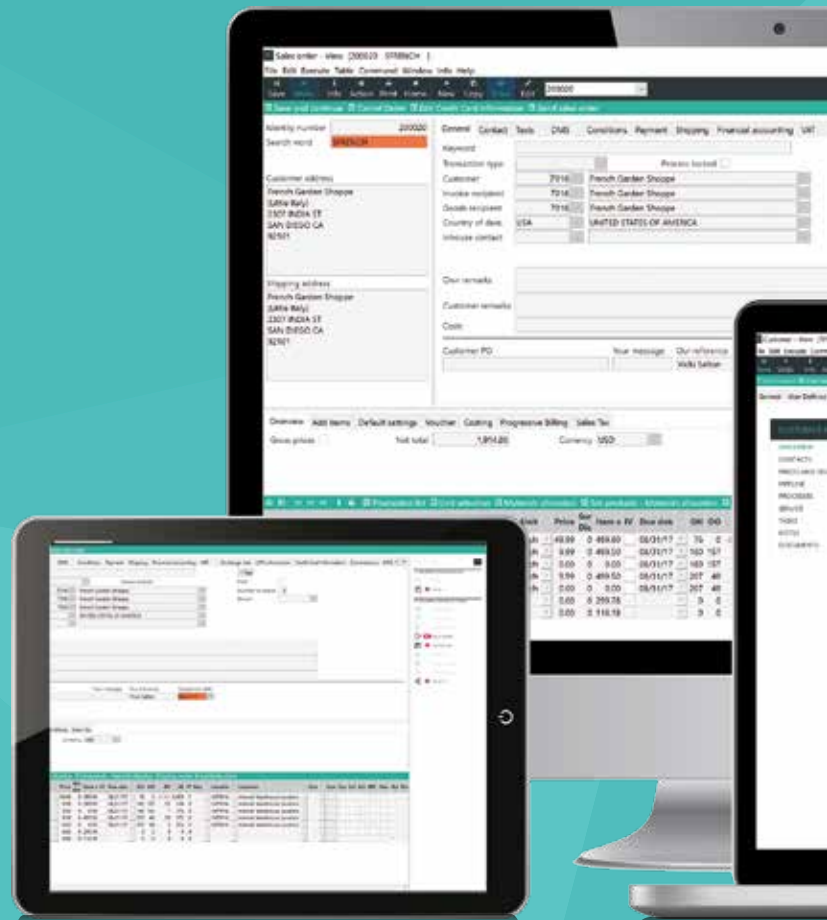
01:29:18

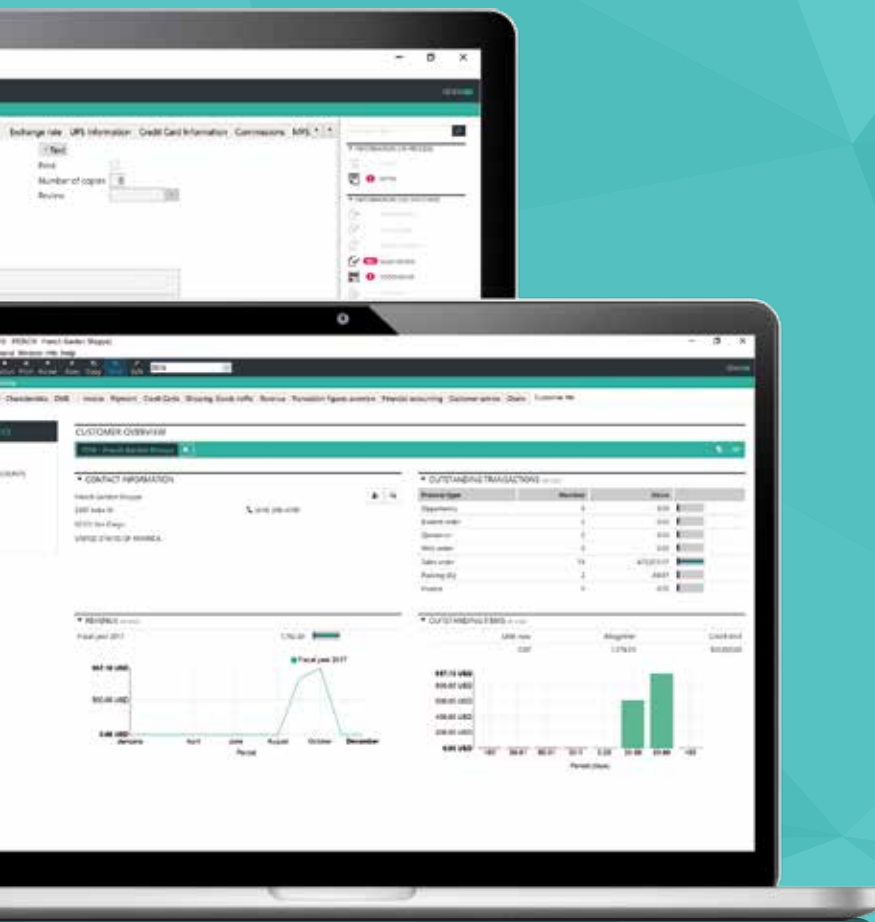
Time in Planned Downtime Job / Shift

01:29:18 / 01:39:38

THE MOST IMPORTANT ERP FUNCTIONS IN THE INDUSTRIAL MACHINERY SECTOR INCLUDE:

- # Customer and project files provide a comprehensive overview, for example, of revenues, outstanding items, outstanding processes and tasks, notes, archive documents from the document management system, service devices, and current service processes.
- # Sales order/Project related procurement
- # Variant management: Standard, alternative or supplemental product structures
- # Lot/Serial number management
- # Device file with lifecycle BOM and spare/wear parts list
- # Capacity planning
- # Production/Assembly planning with graphical console
- # Flexible costing structures for preliminary, concurrent and final costing, with effects on purchasing, production, and stock valuation





- # Sales order/Project related production list; growing, project related production lists; editable order production list
- # Precise product and project valuation with consideration of material, external, production, and assembly costs as well as the external procurement costs or services used
- # Multi-dimensional contribution margin accounting
- # Key figures and evaluations for industrial machinery manufacturers, for example, development of the procurement costs (raw material prices, supplementary costs), production efficiency (utilization rate, processing times, rework quota), service efficiency (utilization rate, availability, repurchase rate, CIP), P+P costs
- # Mobile applications, for example, for sales, purchasing, service, warehouse



About abas:

abas ERP is a complete ERP solution that provides your employees with exactly the functions and information they need. All your business areas will benefit from our extensive product portfolio, which not only includes core ERP software functions, but also a wide range of valuable solutions from APS to project management. Whether you have 10 employees or 1000, our aim is to optimize your processes so that you can save time and costs, improve visibility, implement reliable advance planning, and gain competitive advantage.

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