



A Brave New World for Machinery Makers

Global competition, rising customer demands, and new business models pose challenges

Users of industrial machinery and equipment (IM&E) are locating new facilities with new capabilities around the globe — and are demanding that machine-makers follow them. The industrialization of emerging nations has increased demand for both infrastructure projects (e.g., roads, utilities, buildings, plants) and production equipment around the world. To remain competitive, IM&E manufacturers must develop, source, produce, and service products in new markets — or watch their market shares and profits decline.



Global complexities in every region

IM&E is an intensely competitive global marketplace, valued at approximately \$3.84 trillion.¹ The United States alone exported more than \$139 billion worth of machinery in 2015, and welcomed vast amounts of machinery from China (\$30.6 billion), Japan (\$21.7 billion), and Germany (\$19.3 billion).² Even in their domestic markets, IM&E manufacturers are likely to face substantial foreign competition.

IM&E manufacturing is also a complex market, requiring advanced technical skills and significant expenditures on R&D, production equipment, and service functions. As the use of Internet of Things (IoT) technologies and telemetry increase, the industry's reliance on high-tech is also rising — creating new engineering, electronics, and information technology demands. New competitors in low-cost countries are creating pricing pressures for existing IM&E companies — and threatening their ability to invest in their futures.

Increasing regulation also offers a major challenge. Although some countries are trying to harmonize machine safety standards (governed by the International Organization for Standardization and International Electrotechnical Commission), varied regional and country standards remain in place. Compliance is complicated because while these standards are technically *voluntary* in many countries, they are typically used as *practical* interpretation for industry regulations.³

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¹ *Global Machinery Report*, Euler Hermes, Feb. 2, 2016.

² Clean International Trade Administration, U.S. Department of Commerce.

³ Rockwell Automation.



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IM&E responsibilities for regulations and standards extend well beyond the equipment itself. Safety signs and symbols on machinery must be translated into local languages, and updated regularly to remain compliant with evolving requirements. Varied operating environments (e.g., arid deserts, tropical rainforests, frigid tundra) require equipment customizations. Global logistics also pose obstacles; equipment transported via highway must be adapted to fit local jurisdictions (e.g., road widths can vary by country, sometimes requiring that equipment be sized to local transportation standards).

Even more difficult is the fact that IM&E manufacturers must account for the product's entire lifecycle across the supply chain, ensuring not just quality and service for finished equipment, but sourcing certifications for the components, materials, and software that go into machines. For example, Conflict Minerals regulations prevent the use of minerals, such as gold and tantalum from countries that use their sale to fund aggression (e.g., Democratic Republic of Congo). These minerals are vital to machinery products, yet may not be tracked by smaller-tier suppliers — putting IM&E companies at risk.

Increasingly complex customer requests

Customers are even more demanding than regulators. For example, machines ordered by two customers may *look* similar, but can have dramatically different modes of operation and components depending on the customers' discrete requests and their markets of use, such as cab preferences or preferred safety features. Engineer-to-order and customized projects are now the norm in many IM&E markets; the challenge is to maintain profitability while developing products for multiple markets of one.

At the same time, IM&E manufacturers must integrate new technologies and materials into products to remain competitive. Customers want to capture and communicate real-time information to enterprise systems and applications (e.g., analytics, asset management) via the IoT for assets that include (among others):

- Mining equipment that communicates weight loads and other performance characteristics to remote operators, who then make data-based decisions
- Stamping presses that report and optimize energy draws, controlling energy costs and allowing maintenance to react to dubious surges in power consumption
- Molding machines that detect and adjust to quality variances, reducing waste and improving productivity; monitor safety protocols; and sense maintenance needs.

Machine-makers are responsible not only for embedding intelligent sensors and controls in equipment, but also for training customers on how to leverage new IoT capabilities.

These new product requirements are stressing IM&E production and supply-chain performances. Although the average cycle time in the industrial machinery industry has declined by 12 percent over the last three years — machines are being made faster — those times remain high compared to comparable industry sectors, such as transportation equipment (123 hours for industrial machinery vs. 66 hours for transportation equipment). This represents an opportunity to streamline IM&E production — and increase capacity to support growth.⁴ But speeding up production will require deeper implementations of improvement methodologies (e.g., lean manufacturing) as well as better coordination of complex supply chains via real-time sharing of demand signals and product development data. The made-to-order/engineer-to-order nature of IM&E also requires collaboration with customers and corporate functions (e.g., R&D, materials development, procurement) on highly specialized engineering demands.

From goods to services

As IM&E customers seek to reduce costs, many look to IM&E manufacturers to manage development and installation of production lines, integrate and service equipment from competing IM&E companies, and even manage entire facilities (manufacturing, chemical, mining, etc.). A machine-maker may, in fact, have no products in a given facility, yet still serve as project coordinator for management, service, and support for the entire installation. For some firms, this work offers a new revenue stream, but it also requires skills that many IM&E manufacturers don't have — and investments that many can't make.

Developing advanced MRO (maintenance, repair, and operations) infrastructures can be especially lucrative. Aftermarket service is a new revenue stream and profit center for IM&E companies, helping to close sales for new equipment at low margins in exchange for lengthy service contracts. For example, 56 percent of construction machinery OEMs in Europe cite the importance of aftermarket service as a top industry trend, second only to a shift in demand to markets beyond Europe.⁵



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⁴ MPI Manufacturing Study, The MPI Group, 2015.

⁵ Anna Granskog, Benny Guttman, and Erik Sjödin, "Toward a customer-centric construction-equipment Industry," McKinsey & Company, April 2016.



Equipment service capabilities, however, require deep understanding of customer expectations and advanced facility, staff, and logistics planning. Can an IM&E manufacturer extend services to the corners of the globe and maintain customers' equipment to high standards? And how can repairs be managed most cost-effectively — onsite or depot repair?



New customer relationships

Customer expectations about equipment ownership are changing, too, as many choose to lease — or simply pay hourly rates for machine uptime. For example, of equipment that was financed in 2015 in the United States, a full 39 percent was leased — up from 17 percent of the total value of financed equipment acquisitions in 2011.⁶ IM&E manufacturers face significant decisions as they increasingly retain ownership of machines based at customer sites:

- *Longevity*: If an IM&E manufacturer retains ownership, it's imperative to design machines that last longer — or that can be refurbished and upgraded for re-use. But how much extra cost is worthwhile?
- *Reclamation*: When machines can't be refurbished, materials and components can be reclaimed and re-used in new products. How should recycling needs impact product design and supplier sourcing?
- *MRO awareness*: IM&E manufacturers need to fully comprehend *how* customers operate leased equipment. Can machine-makers digitally connect with customer systems to track usage, performance, and maintenance records?

Grow revenues and profits despite challenges

IM&E manufacturers face massive challenges. Savvy executives are navigating this new competitive landscape by:

- *Leveraging business intelligence*: IM&E manufacturers now collect detailed data of actual performance from equipment in use at customer locations. With it, IM&E manufacturers learn how and why customers use products, helping to identify new opportunities to serve customers and improve next-generation machine designs.

⁶ *State of the Equipment Finance Industry*, Equipment Leasing and Finance Foundation.

IM&E executives must craft a combination of products, services, and ownership options that boost sales and profit margins while deepening relationships with customers.

- *Developing a strategy to maximize market share and margins:* It's no longer enough to deliver great equipment. Customers ask for so much more — system design, setup, and installation; maintenance and repair; leasing and operation options; etc. IM&E executives must craft a combination of products, services, and ownership options that boost sales *and* profit margins while deepening relationships with customers.
- *Improving the organization:* Competitive pressures are forcing IM&E manufacturers to boost the quality and speed of every process, from product development to operations to service. This requires strong leadership and significant investments in new skillsets (e.g., IoT, MRO); process improvements; new capabilities (e.g., additive manufacturing, information technology); and advanced business systems and software solutions.



IM&E manufacturers face diverse global challenges. Leading machine-makers turn these into opportunities to grow markets and expand revenues and profits.

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