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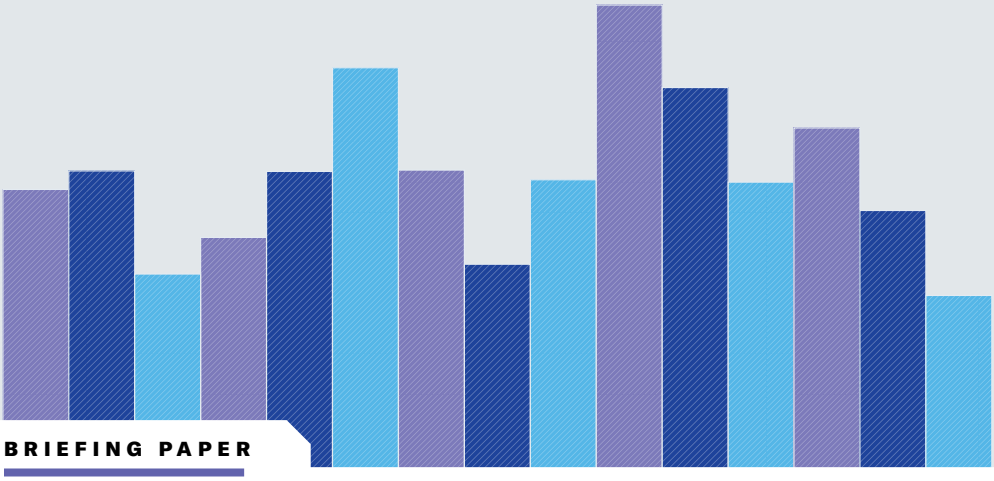
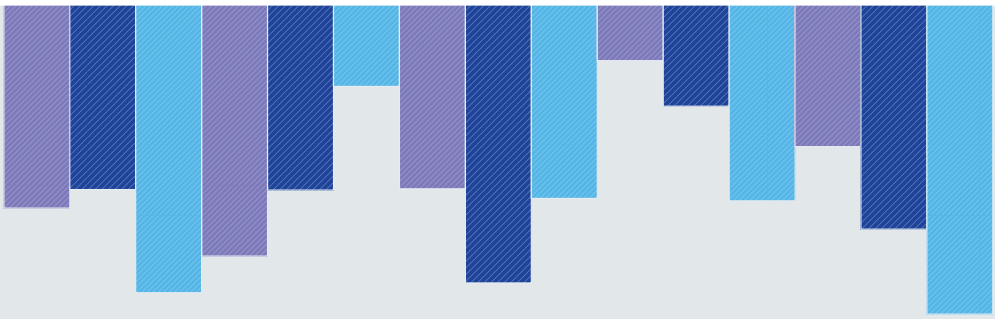


BRIEFING PAPER

Cloud ERP Transforms Manufacturing



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Manufacturers have faced unprecedented disruption over the past three years. Customer demand has been disrupted at the same time that global supply chains have been broken. Inflation, global conflict, climate change, the Covid-19 pandemic, and the Great Resignation have all taken their toll.

As the saying goes, necessity is the mother of invention, and leading manufacturers have adopted software-as-a-service (SaaS) ERP to drive efficiency, free up scarce resources, and get better insights into real-time operations to facilitate confident decision making.

ERP has been a mainstay of manufacturing for over half a century, and for good reason. Managing accounts payable, accounts receivable, cash, inventory, demand, sales, and more in an integrated solution enables manufacturers to deliver on their commitments to customers. However, historically, many manufacturers overly customized their ERP solutions, resulting in unnecessary complexity and cost, as well as poor performance.

With SaaS ERP, manufacturers are identifying, standardizing, and automating business capabilities that are non-differentiating. That is, they need to be done, but they don't differentiate the manufacturer to its customers. Think tax, treasury, accounts payable, and so on. SaaS ERP's core processes are continually optimized based on thousands of companies all using them. And by using cloud technologies, manufacturers of all shapes and sizes can compete globally at scale.

ERP is not just "back office." When it comes to customer experience, there is no "front office" and "back office." The past few years have really brought this point home. As customers have placed orders only to have the delivery date shift time and time again due to supply chain challenges, their experience has not been positive.

Leading manufacturers know that to differentiate and survive in today's digital experience economy requires every interaction with a customer to be a good one. They also know that sustainable manufacturing and profit are not an "or," but an "and."

We've sponsored research by Harvard Business Review Analytic Services to examine how manufacturing companies deliver exceptional customer experiences by leveraging SaaS ERP and a clean core of standardized industry-leading processes.

Through interviews with manufacturing companies that are adeptly navigating storms of continual disruption, this knowledge brief will share their secrets of how they created tangible business impacts and helped their companies optimize, grow, and become more sustainable.

There is not going to be a return to "normal." Nor will there be a "new normal." Instead, there will be "today's normal" and "tomorrow's normal," and manufacturers will thrive by proactively adapting to changing circumstances. SaaS ERP provides the solid platform upon which sustainable differentiation and innovation can thrive.

Read on for invaluable strategies for winning today, tomorrow, and into the future.

Cloud ERP Transforms Manufacturing

Manufacturing is truly a cornerstone of the global economy. It's also a relatively conservative industry—one in which change can sometimes come around slowly. Nevertheless, manufacturing companies in the automotive, high-tech, and construction industries have weathered the storms of the global pandemic, supply chain challenges, and staffing shortages quite well.

Now manufacturing companies are positioning for the future and their continued adoption of advanced digital operations. Many are looking to digital technologies, specifically cloud ERP and SaaS, to help automate and standardize core business processes that all manufacturers need, including finance, supply chain, and procurement. Some manufacturing organizations are now going deeper and turning to cloud ERP and industry cloud solutions to differentiate other business processes.

Technology research and consulting firm Gartner defines industry clouds as customizable solutions "designed to meet the specific needs of vertical industry segments inadequately served by generic solutions." A 2022 Gartner survey[1] of North American and European enterprises revealed nearly 40% of respondents had started adopting industry cloud solutions on open platforms and another 15% are at the pilot stage. By strategically embracing ERP in this way, manufacturers can focus on their core competencies, become more flexible and scalable, and make the most of the data they amass. But this strategic focus in and of itself is not enough. Manufacturers must have a common data layer to access data from all lines of business, such as finance, logistics, and HR.

Executives across the entire manufacturing value chain—from the chief operating officer, chief technology officer, chief financial officer, and chief information officer to the heads of research and development, engineering,

HIGHLIGHTS

Using cloud ERP for core processes and industry cloud solutions to more **uniquely distinguish their brands**, manufacturers can increase business insights, ensure a flexible supply chain, and scale factory operations for future growth.

Making one aspect of the supply chain more dependable **can have a ripple effect** that solidifies the rest of the supply chain.

Because cloud-based ERP can make data sharing so efficient, it stands to reason that **productivity improvements will follow**.

"We have a cloud-first policy—as much is in the cloud as possible. We need a constant and flexible state-of-the-art IT concept, and we want to have data-driven decision making. This is the mindset of future-oriented manufacturing," says Dr. Timo Boehm, project manager at the Smart Press Shop GmbH & Co. KG, a joint venture between Schuler AG and Porsche AG.

IT, and manufacturing—are coming to the same conclusion. When companies compare their existing systems to what cloud providers have already optimized across thousands of users in specific vertical markets, many are finding the cloud to be the faster path to productivity. Using cloud ERP for core processes and industry cloud solutions to more uniquely distinguish their brands, manufacturers can increase business insights, ensure a flexible supply chain, and scale factory operations for future growth. In fact, according to a 2022 survey of manufacturing firms conducted by Wipro, 47% of respondents report an increased ability to launch new products, increase customer retention, and enter new markets following cloud adoption. That same study revealed 37% of respondents report using cloud solutions and cloud ERP to drive product development, R&D, and innovation.[2]

Supporting standard operations with cloud ERP combines the benefits of flexibility, scalability, and standardization of business processes. "The cloud is critical for quickly getting companies to run more efficiently," says Mike Galbraith, CFO of Damon Motorcycles, which is based in Vancouver, British Columbia. "And leveraging the best practices many of these systems offer is helpful. We're absorbing the best practices of cloud ERP providers that have designed numerous business systems." Just six years old, Damon Motorcycles focuses on building electric motorcycles manufactured in a cloud ERP environment.

"While the cloud is not new, it is relatively new to manufacturing. And I believe we are one of the first companies worldwide to be moving manufacturing into the cloud," says Dr. Timo Boehm, project manager at the Smart Press Shop GmbH & Co. KG, a joint venture between Schuler AG and Porsche AG based in Göppingen and Stuttgart, Germany, respectively. "We have a cloud-first policy—as much is in the cloud as possible. We need a constant and flexible state-of-the-art IT concept, and we want to have data-driven decision making. This is the mindset of future-oriented manufacturing."

Using a cloud-first strategy to unite all aspects of manufacturing is also in play at Damon Motorcycles. "We're bringing in cloud services across all our functions, everything from sales and marketing and our e-commerce store to how we capture data from our motorcycles," says Galbraith. "For us, it's about getting everything in place to be able to scale up rapidly. We want to deliver the bikes we promised as fast as possible."

This paper examines how digital technologies and cloud ERP systems can drive better business decisions and how organizations can benefit from the standardized business processes found in industry clouds. "You can rely on the best practices built into a cloud-based ERP system and benefit from that standardization," says Floris Lettinga, director of sales and marketing for Yanmar Marine International, a global manufacturer of yacht engines based in Almere, the Netherlands. "We can focus more on our core competence. Instead of developing our own internal business flow, we can rely on that external knowledge."

Without a common cloud ERP system across all lines of business, he says, it would be very different. "We may believe we're doing the right thing in the most efficient manner when actually we're probably not."

The Cloud in Manufacturing

Manufacturing firms worldwide are endeavoring to become more flexible, more scalable, and more efficient in response to a wave of challenges brought on by global supply chain issues, staffing shortages, and the need to innovate in an increasingly digital world. Moving to cloud ERP for core processes and industry cloud extensions for specific processes is helping them accomplish all those goals in all aspects of their operations—from the shop floor up through internal business operations and even to how they interact with customers.

It can be particularly useful for manufacturers to leverage public clouds to help augment and streamline their IT infrastructures. When using public clouds for ERP, manufacturers can deploy more rapidly and leverage existing best practices already developed by hundreds of other users worldwide, making for smoother implementation. The standardization inherent in cloud ERP also minimizes the need for customization and maintenance over the long term.

47%

of respondents report increased ability to launch new products, increase customer retention, and enter new markets following cloud adoption, according to a 2022 survey of manufacturing firms conducted by Wipro.

Manufacturing organizations ranked as "cloud leaders" report a 42% ROI, as opposed to 24% for those just getting started and 30% for those organizations ranked at the intermediate cloud-adoption level.

Moreover, public cloud platforms enable companies to scale up or down without the additional effort and expense of managing servers and other equipment. They are also less expensive than hybrid or private clouds, which come with their own infrastructure expenses.

One of the greatest strengths of cloud ERP is how it can focus manufacturers to modernize their operations, be more responsive to change, and be open to the digital future. The most innovative manufacturing companies are moving one step further toward the concept known as the "smart factory," which Gartner defines as "different combinations of modern technologies to create a hyperflexible, self-adapting manufacturing capability. Smart factories are an opportunity to create new forms of efficiency and flexibility by connecting different processes, information streams, and stakeholders."

In fact, manufacturing is leading several other sectors in cloud adoption (especially among the 130 European manufacturing executives surveyed), with 32% having reached "cloud leader" status, according to the 2022 report "Redefining Manufacturing for the Digital Era," released by Wipro.[3]

Manufacturing organizations ranked as cloud leaders report a 42% ROI, as opposed to 24% for those just getting started and 30% for those organizations ranked at the intermediate cloud-adoption level. Manufacturers in the early stages of cloud adoption (27% of respondents) indicate they are less effective in getting products to market, performing risk management, and generating shareholder value. **FIGURE 1**

The most forward-thinking manufacturing companies, such as those in the automotive and high-tech sectors, are differentiating themselves the most by adopting cloud-based best practices. These organizations are moving toward consumption-based business models, building greater resilience and intelligence into their supply networks, and developing digitally astute products. They are also achieving a greater level of intimacy in their customer relationships.

Cloud ERP is helping Damon Motorcycles share more information both internally, with company executives, and externally, with vendors and customers. "Cloud services are affecting both sides of the value chain," says Galbraith. "There's lots more to be done to deeply integrate with vendors and enable the exchange of information. On the delivery side, we engage with customers via our own cloud platform, so when we begin to deliver vehicles (in early 2023), we can organize that via an app hosted on our cloud."

Better Planning and Pay As You Go

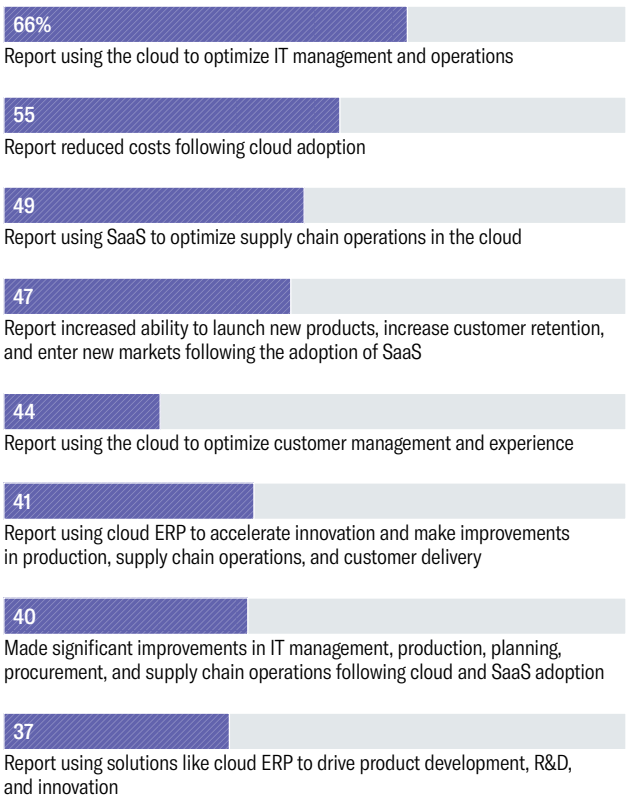
Moving toward a consumption-based business model allows manufacturing firms to plan more accurately for obtaining and paying for the raw materials they use. It means taking steps to acquire and build platforms that allow greater flexibility in paying for those materials and services as they are acquired and consumed. This transition requires tighter inventory analytics and control, as well as integrated business planning.

FIGURE 1

Manufacturers Reap Benefits of the Cloud

Cloud ERP is helping them accelerate innovation the most

How manufacturing companies worldwide are seeing the benefits of adopting cloud-based ERP and SaaS in production and business operations:



Source: Wipro survey, August 2022

Extensive data sharing between manufacturers and material vendors is needed for consumption-based planning to work. "For our supply chain, we need data from our suppliers and they need data from us," says the Smart Press Shop's Boehm. "For example, right now we have to order a particular alloy three months in advance. With data from our cloud platform, we can reduce this to just a few weeks. By planning with accurate data, when the order comes in, [suppliers] can produce it."

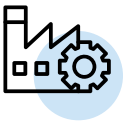
In the manufacturing realm, having access to the more up-to-date data that consumption-based business modeling makes possible translates directly to more accurate planning. "Previously, we would key in an order for materials and hope for the best. Now, we key in a purchase order [PO] with the respective dates [for] when we need the materials and can plan for our needs," says Yanmar Marine International's Lettinga. "We can plan with our suppliers what we would like to have in terms of material flow. And we can create superior visibility, both in terms of supply chain and customer visibility." With POs for the next 12 months in queue, Lettinga says his company can plan for cash flow, inventory behavior, and requirements from suppliers. This planning is made possible because of the cloud ERP systems and a business network also accessible by suppliers.

That tighter, more integrated business planning also helps enforce standardization across departments. Prior to using cloud ERP, "if the financial department needs a business intelligence [BI] system, they go out and get a BI system," says Boehm. "Then production also decides it needs a BI system, so they get a BI system, too. Then marketing gets its own BI system, and you have three different BI systems. It would make much more sense to have one system working off the same data set, perhaps with different interfaces for different use cases."

Working with cloud ERP not only unifies reporting across departments but also relieves the burden of regular software maintenance and updates and generally eases internal IT operations. The cloud providers "look after their ERP environment, and we just use it," says Lettinga. "One of the key considerations we had was to eliminate muda, which is Japanese for waste. In our view, anything not part of our core business should be outsourced."

Supply Chain Resiliency

Adopting cloud ERP can increase supply chain resilience and improve product quality. At Damon Motorcycles, for example, the company's operations group uses cloud tools to help ensure the company is capturing the right data on parts and processes. As an automotive supplier, the company is obligated to track every component down to the item level for every vehicle the organization builds and delivers.



"We can plan with our suppliers what we would like to have in terms of material flow. And we can create superior visibility, both in terms of supply chain and customer visibility," says Floris Lettinga, director of sales and marketing for Yanmar Marine International.

"We have a complete record of everything that has gone into every vehicle we have built so we can understand tolerances and issues and problems in the field," says Galbraith. "If there is an issue, we have to be able to track that back to lot-level supply information to understand any issues that might need action. [There is always data] in flight at various levels."

Elaborating on his custom alloy example, Boehm further explains how cloud ERP enables supply chain resiliency for his organization. "Every month, we need a certain amount of this alloy from our supplier," he says. "But the process to produce it is sensitive and requires several steps to complete. If the supplier must change something, they may have problems because they need to share the data on the nature of the material."

To prevent supplier-led problems from happening and to expedite production, Boehm's cloud ERP system automatically shares real-time data with the Smart Press Shop's supplier on all aspects of the process. As a result, the alloy vendor "can reduce the time it takes to make the material," he says. "With such planning, they do the first few steps in advance and then finish the last two steps once the order comes in. They can plan ahead and plan more accurately." Like the Smart Press Shop, other manufacturers focused on on-time delivery are discovering that giving critical suppliers online access to their cloud ERP systems is just as important as having warehoused parts.

Making one aspect of the supply chain more dependable can have a ripple effect that solidifies the rest of the supply chain, as well. "Our supply chain is more like [multiple] supply chains," says Boehm. "You may have a really good supply chain within your network, but when you exchange the necessary data, you can connect these chains so you get a stronger, more reliable, and more efficient chain throughout."

"The smart factory is more about a highly adaptable and responsive factory and supply chain. It lets you offer choices to customers and easily absorb design changes without too much downtime," says Mike Galbraith, CFO of Damon Motorcycles.

Because cloud-based ERP can make data sharing so efficient, it stands to reason that productivity improvements will follow. In fact, that Wipro "Redefining Manufacturing for the Digital Era" study further revealed that 40% of European manufacturers made significant progress using cloud ERP to help generate improvements in IT management, production, planning, procurement, and supply chain operations. And overall, 51% of manufacturers across all stages of cloud adoption reported improved planning and decision making.

Connected Products That Satisfy Customers

Cloud ERP is particularly well suited for markets where the development, manufacture, and distribution of innovative, digital-savvy products are required. These situations frequently require embedding software controls and compatibility into products in the field. Configuring for advanced variants, maintaining connectivity to deliver updates, and instituting project and portfolio management may also be needed.

Damon Motorcycles faced all these requirements—and then some. "We have a multitude of sensors and software built into the vehicle, and the vehicle is connected back to our Damon cloud wirelessly," says Galbraith. "That lets us push software updates and upgrade algorithms for customers to fix any issues and understand what is happening with the motorcycle."

These connected Damon motorcycles are not simply waiting for updates, either. They are delivering telemetry data back to the Damon cloud to provide updates on vehicle performance and any events leading up to an incident. "It's a two-way connection," explains Galbraith. "A big part of the Damon Motorcycles story is having those vehicles connected so we can get telemetry data from them. If there's an accident, we can understand what happened and what the sensors were telling us prior to the event so we can build better safety algorithms for riders."

Such deeper levels of planning and integration are helping companies achieve a greater level of intimacy with every client. By understanding what customers want and how their needs are evolving, manufacturers are better able to deliver products that satisfy customers and meet their changing demands.

"We work really closely with customers to gather information and challenge ourselves to understand what that looks like on [both] the product side and the customer service side," says Galbraith. "Using this information, we can explore a wide variety of customer scenarios." For a company like Damon Motorcycles that does not use a dealer network and ships directly to customers, such "what if" customer planning is particularly valuable.

The flexibility and data delivery inherent in cloud ERP also help facilitate product customization for customers. "We have the Hyperdrive as our core power train for the vehicle," says Galbraith. "The battery, the motor, and all the vehicle electronics fit into this one platform. Then we wrap different forms of motorcycles around the platform, so we're going to have many different forms of motorcycles that can be built" on a single product base.

Developing innovative products tailored for specific customers goes to the heart of the company's business model, so having complete flexibility in its manufacturing systems was never in question. "Given our product design, we knew we needed to create a manufacturing process that would be equally flexible so we can quickly adapt. The system lets us build multiple different types of vehicles, and we don't have to change systems to do different vehicles," says Galbraith. "We can run our common platform down the line and do final configuration based on the specifications of a customer order."

Damon Motorcycles' bet on the cloud for flexibility and innovation is increasingly common as organizations in fast-paced, competitive markets move beyond the earliest appeal of software supporting core business processes as a mechanism for cost savings. In fact, in an October 2021 survey by Harvard Business Review Analytic Services, 300 respondents familiar with their organization's cloud strategy most frequently named increased business agility, cost reduction/flexibility, and accelerated innovation among the top business outcomes they sought most from their investments in the cloud.[4] **FIGURE 2**

Moving to the Smart Factory

The combined impact of cloud ERP and other cloud technologies on the manufacturing sector continues to drive the smart factory concept. While the term "smart factory"

may conjure images of sophisticated robots on an assembly line, the true smart factory is much more than that.

"The smart factory is more about a highly adaptable and responsive factory and supply chain. It lets you offer choices to customers and easily absorb design changes without too much downtime," says Galbraith. "You also need a business system architecture to enable that, everything from product lifecycle management and e-commerce to the back and front ends feeding into your ERP, and quality management system and logistics systems all working seamlessly together. You're only as flexible as your most inflexible system."

The smart factory's ability to accurately plan further into the future not only expedites current operations but also helps production planning in the near term. "We have a complex material flow from different vendors. Lead times are long. To optimize our work environment, we have to plan material flow. And that has been one of the biggest improvements we've seen so far," says Lettinga. "We register orders so we can plan months ahead and recognize trends. For example, we can compare open order performance versus sales performance, which gives us an interesting analysis." This comparison is facilitated by a cloud ERP that operates all core business processes for all lines of business.

"To optimize our work environment, we have to plan material flow. And that has been one of the biggest improvements we've seen so far," says Yanmar Marine International's Lettinga.

Boehm concurs. When it comes to the smart factory, "it's the total network that counts," he says. "If one thing is too strong and one thing too weak, it's not good. It has to be level and balanced. The smart factory is more about what you don't see, but it's there."

The smart factory concept draws everyone into the IT realm to one degree or another without requiring a background in computer science. "We are a smart factory, and we don't have any specific IT employees," says Boehm. "And we are running everything 24/7. We want to focus on our core competence, and our core competence is not IT infrastructure. We need the cloud for SaaS and IaaS [infrastructure as a service], and it has to be reliable. You can't duplicate yourself, so you need strong partners."

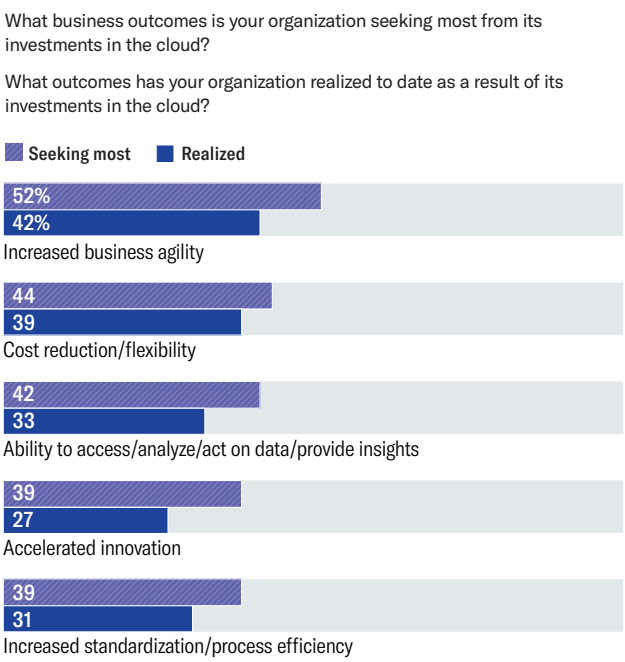
The challenge for manufacturers is to establish a flexible, networked IT infrastructure that supports the company now and over the long term. There will be regular updates from a cloud ERP partner, and companies must be able to adapt their configurations to accommodate those updates. "You'll need to adapt software to your processes, and all your knowledge and experience has to transfer to that evolving software so you can easily bring [the] functionality you need to the shop floor," adds Boehm.

Like many companies evolving their industry cloud, Yanmar Marine International connects every process improvement, every step toward increasing flexibility and efficiency, within the same overall effort. As Lettinga puts it, "We did the open-heart surgery, which was the cloud ERP. Now we are doing the left hand, which is supply chain management. We are doing the right hand next year, which is order receiving. We want to do [the] two legs, as well, which are the operation planning and manufacturing sides. We also want to work on the brain, which is the data analytics, and make sure all is stabilized and working properly before making key improvements."

FIGURE 2

Cloud Goals and Results

Organizations are seeking (and sometimes achieving) improvements in agility, costs, and innovation



Source: Harvard Business Review Analytics Services survey, October 2021

"Flexibility is the name of the game. You have to be able to work with different suppliers based on parts availability and rapidly adjust to changes in design and partners. And [you have to] have a robust business system and architecture to enable that," says Damon Motorcycles' Galbraith.

Looking Ahead

Modern manufacturing executives understand the critical need to focus core business processes through cloud ERP and are taking a strategic approach toward evolving their organizations.

"In order to grow, we had to find efficiency improvements. It's not just a matter of adding people, so we decided to build a new environment to be efficient," says Lettinga. Inevitably, this new environment will be constantly evolving—and different—from systems that came before. Lettinga adds, "The customer will see a different invoice with more information. We are building the online ordering and delivery portal, which will also help us do more accurate planning for materials, even with global instability of logistics. The use of cloud ERP has allowed us to weather the storm and grow the company."

Establishing this new level of efficiency and flexibility is critical to thriving in this complex environment. "Flexibility is the name of the game," says Galbraith. "You have to be able to work with different suppliers based on parts availability and rapidly adjust to changes in design and partners. And [you have to] have a robust business system and architecture to enable that."

Such is the price that manufacturers must be willing to pay in exchange for the flexibility, scalability, and constantly expanding set of best practices that cloud ERP and industry clouds provide. Manufacturing organizations that have already adopted cloud-based technologies and a more data-driven strategy are experiencing greater flexibility and scalability, achieving higher efficiency, producing more innovative products, and streamlining operations. Today's global market "is definitely Darwinian," says Galbraith. "The ability to move rapidly at scale is critical" to survival.

1 Perri, Lori, "What Are Industry Cloud Platforms?," Gartner, September 21, 2022. https://www.gartner.com/en/articles/what-are-industry-cloud-platforms.

2 Wipro, "Redefining Manufacturing for the Digital Era," August 2022. https://www.wipro.com/cloud/redefining-manufacturing-for-the-digital-era/.

3 Ibid.

4 Harvard Business Review Analytic Services, "Accelerating Forward: The State of Cloud-Driven Transformation," February 2022. https://hbr.org/sponsored/2022/02/accelerating-forward-the-state-of-cloud-driven-transformation.

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