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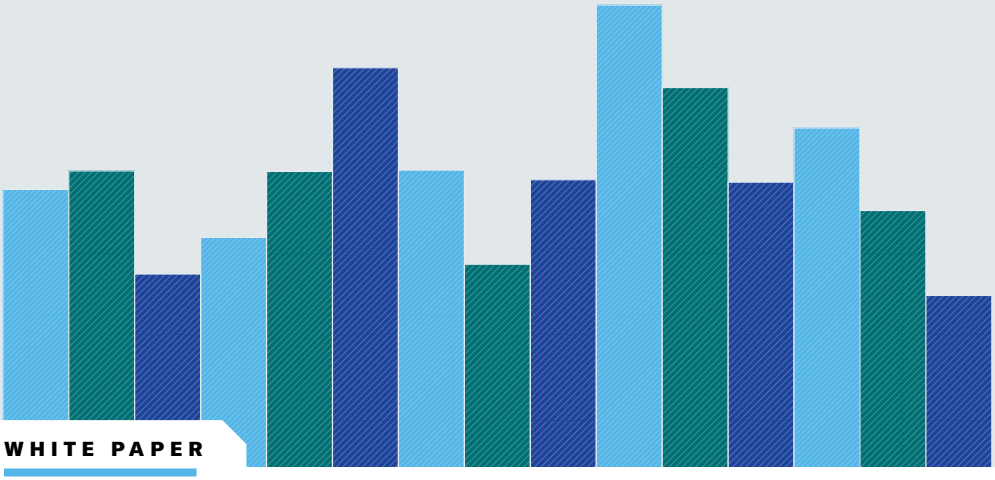

WHITE PAPER

Manufacturing 2025:

Bolder Vision, Stronger Purpose

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The manufacturing industry is undergoing an unprecedented digital-led transformation. This opportunity is empowering manufacturers to innovate with new products and services, accelerate top-line growth, create a superior customer experience, and streamline operations.

Software-defined products are radically transforming business models and the consumption experience. The automotive sector is developing software-defined vehicles—hyperconnected supercomputers on wheels with active safety, infotainment, and advanced autonomous capabilities that provide a more personalized automotive experience. Industrial manufacturers are exploring as-a-service business models with connected products that last longer, operate more predictively, and engage users across the life cycle. Cloud engineering principles are enabling frequent over-the-air updates, effectively creating for customers what feels like a new product every day.

Digital-led manufacturing is transforming factory floor data into valuable enterprise knowledge. Real-time insights from the shop floor and connected supply chains are enabling resiliency, predictability, efficiency, agile decision making, and cross-functional collaboration. Artificial intelligence is driving overall equipment effectiveness improvements by deriving the most optimal set of control variables for running operations.

Sustainability was always a priority for manufacturers and is now a defining purpose for the industry leaders. With an equal emphasis on the planet, people, and profits, manufacturers can create sustainable value for environmental, social, and governance stakeholders; become resilient; and discover cocreation opportunities with customers. Manufacturers must identify greenhouse gas and carbon reduction opportunities across the product life cycle and company operations.

The manufacturing industry is on the cusp of an unparalleled opportunity to create new business models that operate at the intersection of commercial success and environmental sustainability. C-suite sponsorship, proactive talent reskilling, and a clear articulation of the vision and strategy are key to this digital transformation. Wipro is excited to be in association with Harvard Business Review Analytic Services to bring insightful and engaging perspectives from the manufacturing industry and academia to organizations on this digital transformation journey.

Read on.

Ashish Saxena

Vice President & Sector Head, Manufacturing, Americas

Wipro

Manufacturing 2025:
Bolder Vision, Stronger Purpose

Digital technologies are emboldening manufacturers to embark on enterprise-wide digital transformations that are changing the nature of how their businesses operate. Innovative manufacturers are leveraging greater connectivity and increased analytical capability to drive fundamental shifts beyond the shop floor—transforming every aspect of the business, from product design to customer experience, as well as advancing their sustainability goals. Such efforts are helping manufacturers optimize processes and operations and generate new revenue streams through digitally enabled products and services.

Many manufacturing firms are adapting to today's volatile operating environment by pioneering new business models, says Steve Evans, professor at Cambridge University and director of research in industrial sustainability at the British university's Institute for Manufacturing. "A business model is largely defined as the value logic of the company," says Evans. "And changing the value logic of a company is harder than changing the digital strategy of the company, as it is embedded in everything that the company does. But those companies that have seriously invested in business model innovation have done so because a customer or a competitor has caused that to happen."

Enterprise-wide digital transformation provides opportunities for manufacturers to redefine their value proposition either through the development of software-defined products or with new business models, one example being servitization, in which customers pay a fee per unit of a service consumed instead of purchasing a product that provides that service. Such

HIGHLIGHTS

Forward-thinking manufacturers are embracing enterprise-wide digital transformation to **redefine their value propositions**, **pioneer new business models**, **generate new revenue streams**, and **improve operations**, and they are transforming the customer experience in the process.

Manufacturers are **scaling connected capabilities** on the shop floor to **deliver flexible and self-adapting processes**, and they are embracing artificial intelligence, particularly when applied to predictive maintenance.

Ultimately, manufacturers that are reaping the benefits of digitally led business transformations are often those that **align their technology objectives with sustainability**, **a spirit of innovation**, and **investment in their people**.

changes can also usher in a new era of customer centricity through a focus on new, personalized products and better customer experiences across all stages of the product life cycle.

Manufacturers can also improve operational efficiency and drive cost savings. Examples of such efforts include leveraging data analytics to perform predictive maintenance or adopting "smart factory" trends. According to Simon Floyd, director of discrete manufacturing industries at Google Cloud, manufacturers are drawing on a smart factory approach to realize benefits on the production floor and to accelerate business transformation. "Essentially, smart manufacturing describes the combination of various technologies that can lead to a more flexible and self-adapting process," he says. "The key is to harness the untapped wealth of data that manufacturers already have, set systems in place to capture new forms of data, and, more importantly, build historical learning from these data streams."

But the prospect of digital transformation poses challenges, as well as opportunities, for manufacturers. Paul Calver, founder and digital manufacturing director of The Data Analysis Bureau (T-DAB), a British data science and data engineering innovation company specializing in machine learning and artificial intelligence (AI) solutions, notes that while many manufacturers are quick to adopt new technologies to increase productivity on the factory floor, they may struggle to extend transformation efforts across the organization. "The most common barriers to digital transformation are that manufacturers are unclear on how to generate return on investment from data, they are reluctant to move data, and they have concerns about data privacy," he says. Many manufacturers have overcome these concerns by undertaking a mindset shift necessary for enterprise-wide transformation. Others have taken up the challenge of redesigning processes, hiring new talent, or training employees in digital competencies.

As Cambridge's Evans notes, changing a company's business model or basic value proposition is a mammoth task, particularly when a focus on sustainability is part of that value proposition. Sustainability, however, is often a common denominator for all digital initiatives. Ultimately, manufacturers that are reaping the benefits of digitally led business transformations are often those that align their technology objectives with sustainability, a spirit of innovation, and investment in their people.

Digitally led business transformation requires a clear vision, multifunctional collaboration, and strategic alignment on business objectives, particularly for technology investments. "Successful digital transformations often occur when companies match the technology investment with clear outcomes," says Google Cloud's Floyd. "Some overinvest in technology without a clear outcome, which leads to underutilization. Others may underinvest because they are hesitant to make the changes necessary to transform their processes and operations. Getting the balance right—making sure the investment is proportionate and delivers change—requires cultural transformation in tandem with technology transformation."

This report examines how manufacturing companies can benefit from such transformations, with a particular focus on the industrial, automotive, chemical, and processing sectors. It highlights best practices and success factors necessary for the journey. It also explores strategies and technologies companies have employed to increase productivity, forge new business models, improve customer experience, manage the talent transition, and boost sustainability.

New Business Models, Better Customer Experience

Forward-thinking manufacturers are embracing enterprise-wide digital transformation to redefine their value propositions, pioneer new business models, generate new revenue streams, and improve operations, and they are transforming the customer experience in the process.

Some manufacturers are adjusting their business models by turning to servitization. According to T-DAB's Calver, servitization can be game-changing for manufacturers and their customers. This model involves a mindset shift in how products are sold and serviced. "Servitization may be capital-intensive, as it requires manufacturers to develop their products without the promise of a sale," says Calver. "The financial flows are different, but it is profitable. The important shift is that products need to be better designed to last longer."

He points to how servitization would alter the home appliance market—washing machines, dryers, and other so-called white goods—where there is planned obsolescence. Servitization would change that. "Manufacturers used to make their money by designing products that would need to be replaced after eight to 10 years," Calver explains. "In a servitization model, an appliance could last for many more years and still perform brilliantly. But this demands new capabilities to service, upgrade, and modify products, thereby keeping products in the market and securing subscription revenues."

Stellantis, the world's fourth-largest automotive manufacturer, is reaping the benefits of a transformed value proposition, investing in new software capabilities to transform its products and generating new revenue streams. Mamatha Chamarthi, head of software business and product management, is leading Stellantis' transformation from a traditional automotive manufacturer to a customer-centric enterprise that focuses on reducing environmental impact and increasing driver safety. "In 2021, we began our transformation

based on two strategic pillars—electric vehicles (EV) and software—and committed around €30 billion in investment into these two areas,” says Chamarthi.

Stellantis created a dedicated software entity that also works closely with the engineering function in product design and helps the organization formulate new business models and revenue streams. Among the latter are subscription services such as enhanced navigation, which consists of features on demand that car owners can access even 10 years after purchasing the car, and aftermarket services like diagnostics. “This unit focuses on software-defined vehicles, including developing software for electrification—for instance, predicting when a car needs to be charged so as to reduce range anxiety for the driver—and software for autonomous driving, including augmented driver intelligence to prevent accidents,” says Chamarthi. “We also develop software for our connected vehicles to provide customers with value-added features such as stolen-vehicle alerts, automatic SOS emergency calls, maps, and desirable customizable features.”

In 2021, Stellantis had 12 million monetizable connected cars in the market, and it plans to have 26 million by 2026 and 34 million by 2030. “We define monetizable as the first five years of life of the car, as that is where we recoup the maximum revenue,” Chamarthi explains. “Essentially, we now view cars as data platforms.”

Additionally, Stellantis created a mobility-as-a-service company, Free2Move, that offers a range of services to satisfy the multiple travel needs of its customers, including short-, medium-, or long-term auto rentals (from a few minutes to several days or months) and car-sharing.

Customer centricity is at the heart of the company’s transformed business model. “Customer expectations have shifted, especially for connected products. People expect the ability to add customized features to their cars in the same way that they do for their smartphones,” says Chamarthi. Accordingly, Stellantis offers value-added services and features tailored to specific customer desires. For instance, customers who purchase off-road vehicles want an adventurous driving experience, but they may not have the technical ability to navigate trails. “Our features offer these customers training and advice in real time. We support them on how to navigate difficult terrain,” she explains. “And through our partnership with Amazon, we can ensure they have items they need for their journey, such as water or camping supplies. If necessary, supplies could be delivered right to their location.”

Chamarthi credits the success of the company’s transformation and its ability to respond to customer needs to its agile approach. “We had to implement agile at scale,” she asserts. “From a product perspective, we shifted quickly from an automotive manufacturing product life cycle of between five and seven years to a software development life cycle that takes place in iterative cycles of a few months. That’s a massive shift in thinking, and it required everyone, at all levels of the company, to collaborate, adapt, and innovate.”

Meanwhile, one industrial manufacturer, Schneider Electric, has embarked on a transformation program

WIPRO INSIGHT

Unlock Customer Lifetime Value with the Cloud Car Ecosystem

Modern vehicles are becoming hyperconnected supercomputers on wheels, utilizing 30 to 40 technical platforms and being powered by more than 100 million lines of code. As software becomes increasingly complex, automakers are challenged to not only innovate in order to remain competitive but also meet evolving safety and security standards. Automotive manufacturers must effectively integrate with the cloud car ecosystem if they want to bridge the skills gaps in software development, especially when it comes to data security, artificial intelligence (AI), machine learning (ML), and 5G.

Software-defined vehicles (SDVs) must transition toward a centralized computing platform enabled by the cloud to decouple the hardware-software relationship. Furthermore, with this approach, critical apps are isolated for faster certification and maintenance, while noncritical apps can take full advantage of agile software development using microservices, containers, and edge computing. The central processing unit aggregates this data to generate powerful insights for original equipment manufacturers (OEMs) and owners using AI and ML.

"SDVs will leverage AI and ML to constantly gather data, provide valuable information, and, eventually, make autonomous decisions. Unlocking the true potential of SDVs will require moving them to the cloud," says Thomas Mueller, chief technology officer, engineering and R&D services, Wipro Ltd. "We are fast-forwarding to that future by making the cloud car ecosystem available to every automotive company in the world today."

Implementing cloud engineering principles will enable automakers to design, launch, and update vehicles with greater agility, effectively creating for customers what feels like a new vehicle every day. Automakers need to provide updates over the air—much like how smartphones are automatically updated—to launch new features, new services, and even hot fixes without ever requiring the vehicle to leave the owner's driveway. This convenience is only possible by integrating products and services from equipment providers, network operators, and cloud hyperscalers.

Powered by continuous DevOps and cloud services, OEMs can quickly identify, create, and deploy new software that will keep cars digitally relevant for 10 years or more.

that not only improved operational efficiency but also leveraged internet of things (IoT) technology to build and deliver next-generation products and services. The French multinational provides digital solutions for energy efficiency and sustainability in homes, buildings, data centers, infrastructure, and industries. The company's industrial manufacturing division encompasses 200 factories worldwide and produces, among other connected products, devices for low- and medium-voltage energy distribution, such as circuit breakers and contactors.

By manufacturing connected products that produce data, Schneider Electric offers customers improved services by helping them make the most efficient use of energy and reduce maintenance costs. "Currently, we have six million assets connected to our ExoStruxure platform," says Peter Weckesser, the company's chief digital officer. "This platform is at the heart of our IoT system architecture and is the foundational technology backbone on which our solutions are built and delivered. It enables connectivity and intelligence and allows us to deliver digital services to help customers optimize their operations—we either provide customers with data from their products or analyze it for them. We also offer service agreements where we monitor the devices and can fix problems before they occur."

Schneider Electric's value-added digital services are a source of competitive advantage. "This business model complements our traditional manufacturing scenario—once a product is sold, we are able to provide much more in terms of insight, optimization, and predictive maintenance," says Weckesser.

Another company that adapts product specifications and value-added services to meet customer needs is Trane Technologies Co. LLC, a global heating, ventilation, and air conditioning manufacturer based in Dublin. Barry Bonar, director of emerging technology and architecture governance at Trane Technologies, describes how the Thermo King division that builds transport refrigeration units (TRUs) offers customers additional connected services. "Our TRUs have a subscription service, where the owners can access a portal from their mobile phones that provides real-time temperature, location, and reporting data for an entire fleet," he notes. "This

“From a product perspective, we shifted quickly from an automotive manufacturing product life cycle of between five and seven years to a software development life cycle that takes place in iterative cycles of a few months. That’s a massive shift in thinking, and it required everyone, at all levels of the company, to collaborate, adapt, and innovate.”

Mamatha Chamarthi, head of software business and product management, Stellantis

service gives customers greater visibility into the cold chain and helps them to deliver food, at the right temperature, from farm to fork. It can also be very helpful in other areas, such as the pharmaceutical space.”

Chemours, the Wilmington, Del.-based chemical producer, focuses on providing its customers with very specific product solutions. Chemours delivers customized solutions with a wide range of industrial and specialty chemical products for the coatings, plastics, refrigeration, air conditioning, transportation, semiconductor, clean energy, and advanced electronics manufacturing sectors. “We have high aspirations for growth, and our digital business transformation should ensure we reach these goals by providing our customers—and their customers—with superior products that are suited to the application that customers need them for,” says Matthew Abbott, vice president of digital and data analytics at Chemours. “Our transformation has customer centricity at its core.”

Building the Factory of the Future

Floyd believes that manufacturers often invest in technological transformation after seeing the benefits of new technologies on the production line, specifically in quality control and process optimization. “AI, such as computer vision, brings immediate improvement in quality control by detecting conditions that are good, bad, or anomalous,” he explains. “This type of technology can be more cost-effective than traditional quality inspection, is significantly more efficient, and is flexible. The improvement in processes and quality procedures can transform entire operations—manufacturers can look beyond one machine or one process and start to think holistically about the entire system. For instance, they may begin to look at a digital representation, or a digital twin, for the entire factory or assess how to better utilize their equipment across multiple factories.”

Manufacturers are scaling connected capabilities on the shop floor to deliver flexible and self-adapting processes, and they are embracing AI, particularly when applied to predictive maintenance. For many manufacturers, predictive maintenance is the starting point of their digital transformation journey, since it can deliver immediate cost savings. “Globally, manufacturing firms could be losing up to $1 trillion a year in unscheduled maintenance,” says Calver.

Predictive maintenance has a clear ROI and can provide both a quick win and tangible results. “Calculating ROI on predictive maintenance projects can be quite simple,” Calver asserts. “Companies can estimate how much downtime they are likely to have on a machine, how much more product they could produce, and how much waste could be avoided and measure this against how much it would cost to implement machine learning or AI for predictive maintenance.”

Chemours recently experienced the benefits of predictive maintenance. The company established a new enterprise-wide digital and data analytics team in September 2021, and predictive maintenance was one of the first areas it explored.

Chemours' Abbott notes that an initial predictive maintenance proof-of-value project yielded immediate results. "In our Titanium Technologies business, it was discovered that a particular valve was clogging up as the product flowed through it," he recounts. "A collaborative team of process control engineers, front-line operators, and data scientists analyzed the data and built a model to predict when and how the flow degraded over time. Using the data available to us, we can now proactively change out the valve prior to it clogging and have saved approximately $1 million in future maintenance costs."

Chemours' digital transformation is in its early stages, and Abbott is considering how the organization will scale such pilot projects. "We're still at the proof-of-value stage in many instances," he asserts. "What we need to avoid is getting stuck in 'proof-of-concept purgatory' and keep repeating small proofs of concept everywhere. We need to meaningfully pursue value that is quickly scalable across the company."

The problem of scaling proof of concept is a common one. According to Calver, it is estimated that around 80% of companies struggle to scale successful data analytics or AI pilot projects and to do so at reasonable cost. "The reason they can't scale is because they lack a machine learning operations infrastructure, including a set of practices for collaboration between data scientists and operations professionals, to handle data analytics across the organization," he explains. "The companies that manage to scale successful initiatives are often the ones focusing not only on the technology but on how it can change their entire organization. Often, they work in a non-siloed way, where people across the organization collaborate to meet digital transformation objectives."

Chemours plans to scale its transformation by focusing on how digital transformation and advanced data analytics enable the overall business strategy and drive key performance indicators. As a first step, Abbott plans to improve factory performance through greater use of predictive analytics and the deployment of integrated planning systems to prevent bottlenecks in supply chains. He also plans to make better use of the data the company already has on customer preferences and product formulations.

"As an organization with more than 200 years of legacy, we have data that goes back decades, but we have never unlocked it in a meaningful way to use as a competitive advantage. Now we have the cloud computing power to do just that," he says. "But our transformation will only succeed if we're ready to make that cultural shift of actually using data to make informed decisions about how we work with customers, how we manage the supply chain, how we run our manufacturing plants, and how we create and innovate new products and deliver against our sustainability goals."

Schneider Electric's recent transformation program aimed to improve operational efficiency and gain better visibility across its supply chain. Weckesser, the chief digital officer, notes

WIPRO INSIGHT

Liberating Factory Data to Enhance Overall Equipment Effectiveness

Manufacturers have started to rapidly scale their digital transformation initiatives that passed the pilot-to-integration transition in lighthouse factories to all their production facilities in order to enhance overall equipment effectiveness. The latest wave of digital technologies can help liberate factory floor data to enable predictive maintenance, higher productivity, and greater asset uptime.

"The structure and multiplicity of data sources for factories have challenged manufacturers in their quest to obtain a unified view of their machines, material, and methods," says Ankur Pawa, manufacturing domain head, Wipro Ltd. "Today's cognitive and advanced technologies enable manufacturers to convert factory floor data into valuable enterprise knowledge, leading to improvements in quality and productivity."

By leveraging disruptive technologies, real-time data from multiple machines and methods can be fed into a single data model to generate a unified view of the factory floor. For a truly connected factory ecosystem, manufacturers must rapidly evaluate, deploy, and scale digital twin technology, collaborative manufacturing platforms, and autonomous plant capabilities.

A digital twin can feed data into algorithms that can help detect anomalies, predict the quality of the finished goods, and suggest corrective and preventive actions to improve the cost of quality and asset uptime.

Further, collaborative manufacturing capabilities enable automated knowledge transfer, including of best practices and algorithms across factories. A mature artificial intelligence capability set, including reinforced learning and cognitive computing, ensures continuous learning from sensors and enterprise and external data to build an autonomous plant.

To realize the full potential of digital manufacturing, organizations need to focus on building shared teams and capability models, allowing enterprise-wide implementation of processes and technologies.

that the program is still ongoing but has shown encouraging results. “We saw room for additional efficiencies across product design and product manufacturing,” he explains. “To improve productivity and efficiency, we invested in a full integration of our product life cycle management and enterprise resource planning platforms. This gives us greater visibility across our supply chain, allowing us to better predict and manage component shortages. We also have far more visibility into where our products go, which is complex, as the end consumer doesn’t buy directly from us—we have multiple distributors, systems integrators, and electricians that purchase from us and then sell to the end user.”

Aligning Digital Transformation with Sustainability

“Organizations can use technologies that provide more data, more connectivity, and more analysis and combine these to deliver sustainable change in three waves,” Evans explains. “The first wave is around productivity, essentially doing more with less, such as using data to drive material or energy reduction through technologies such as AI and IoT. The second wave builds resilience by harnessing technologies to deal with disruption, essentially being able to operate under a wider range of conditions, such as mapping material flows or exchanging waste. Ultimately, the goal is the third wave—making sure society can live within the means that the planet offers.”

Many manufacturers are taking an organization-wide, holistic approach to their digital transformation endeavors, including fostering a culture of innovation, investing in people, and aligning business models with their sustainability agenda.

The secret to kick-starting or scaling digital transformation across the organization, according to Calver, is for organizations to believe in the art of the possible. “Manufacturing firms need a digital transformation champion, someone who has been trained in the art of the possible,” he asserts. “This person knows what technologies are out there and can help the organization assess how various technological advances are applicable to their business, for instance, in solving logistics and supply chain issues, increasing productivity, streamlining processes, or better serving customers.”

Trane Technologies makes such technology intelligence gathering a corporate priority. “We look at what emerging technologies are in the global landscape, right from an embryonic stage, and assess when and how they could be applicable to our business capabilities,” says Bonar, emerging technology and architecture governance director. “For instance, we categorize each technology according to whether we can adopt it, assess it, trial it, or explore it.”

This approach has helped Trane Technologies spearhead innovation across the organization. “The emerging technology role is connected to all aspects of engineering, supply chain, product innovation, multiple IT groups, and business units,” he explains. “Essentially, this function increases awareness of what is possible, and that is a catalyst for company-wide

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Barry Bonar, director of emerging technology and architecture governance at Trane Technologies

WIPRO INSIGHT

A Digital Path to Sustainable Manufacturing

Ambitious net-zero targets can only be met through a balanced emphasis on the planet, people, and profits. Sustainability is now essential to the future competitiveness and growth of manufacturing organizations. However, to accelerate progress toward environmental, social, and governance (ESG) goals, digital technologies must be widely adopted across the manufacturing industry value chain.

This effort includes leveraging the digital, decarbonized, and dependable (3D) sustainability framework to create sustainable value for ESG stakeholders, become resilient, and discover cocreation opportunities with customers. Taken separately, each of the 3Ds requires organizations to take a specific approach that contributes to the sustainability as a whole.

The digital effort requires organizations to transition to smart and connected factories and supply chains that gather and analyze data through cloud computing, as well as adopt internet of things and simulation technologies to further enhance process efficiency and optimize resource utilization.

Decarbonization, meanwhile, involves identifying carbon reduction opportunities across the product life cycle and company operations with a circular economy approach. It also entails adopting alternative energy solutions and carbon-neutral materials.

Last, dependability requires prioritizing employee safety and well-being to create a reliable working environment. It also involves adoption of data-led predictive maintenance to enhance equipment uptime and reduce rework.

Leveraging digital technologies for ESG compliance gives manufacturing organizations the impetus to achieve their sustainability goals and drive value creation. Manufacturers are transforming their legacy plants into intelligent factories by scaling technologies to identify risks, ensure compliance, and enable accurate ESG-related reporting, while deployment of connected sensors enables real-time tracking of asset and resource utilization to understand the environmental and financial implications.

innovation. No one exclusively owns innovation; we are all responsible for it—and for finding new ways to meet our strategic objectives."

For instance, Trane Technologies found a way to prove that blockchain can be used in an energy-efficient, sustainable way without using heavy computing power like that required for cryptocurrency operations. "Most people think of blockchain in relation to cryptocurrencies, but it can be applied in our business context, specifically in refrigerant management," says Bonar. A specific problem when trying to reduce carbon emissions relates to tracking and accounting for all refrigerants, detecting and recording leaks, and reporting all this information in a compliant manner. "We identified and created a concept to prove that blockchain could solve this problem. Blockchain provides an auditable record of all this information in a sustainable way using an energy-efficient consensus mechanism," he says.

Trane Technologies is committed not only to reducing carbon emissions but to sustainability, as well, and these efforts are at the core of its value proposition. "Trane Technologies has become a pure-play climate company, focused on combating climate change through the way we heat and cool industrial buildings and homes and how we help our customers transport essentials such as food and medicine," says Bonar. "We also design products to track and potentially help to improve indoor air quality, especially now that the Covid-19 pandemic has brought health and safety measures to the world's attention."

In October 2021, the company was awarded the Reuters Responsible Business Award in recognition of its having a business model that focuses on sustainability and the achievement of carbon-neutral operations and zero waste to landfill. Trane Technologies is addressing climate change through an ambitious goal of reducing its carbon footprint and that of its customers by a gigaton by 2030. Efforts to meet this goal include developing next-generation products such as refrigerants designed for lower environmental impact and higher efficiency, as well as investing in monitoring and maintenance technology to ensure that buildings can be maintained, retrofitted, and managed to reduce greenhouse gas emissions.

The Digital Competency Gap: Train or Hire?

Investing in digital capabilities to support new business models demands new skills that manufacturers traditionally lack. Increasingly, manufacturers need digital natives—folks who have grown up in the Information Age and who can consume and interpret digital information quickly and effortlessly. "These are two great, very different disciplines: digital and manufacturing," says Evans. "Of course, the Venn

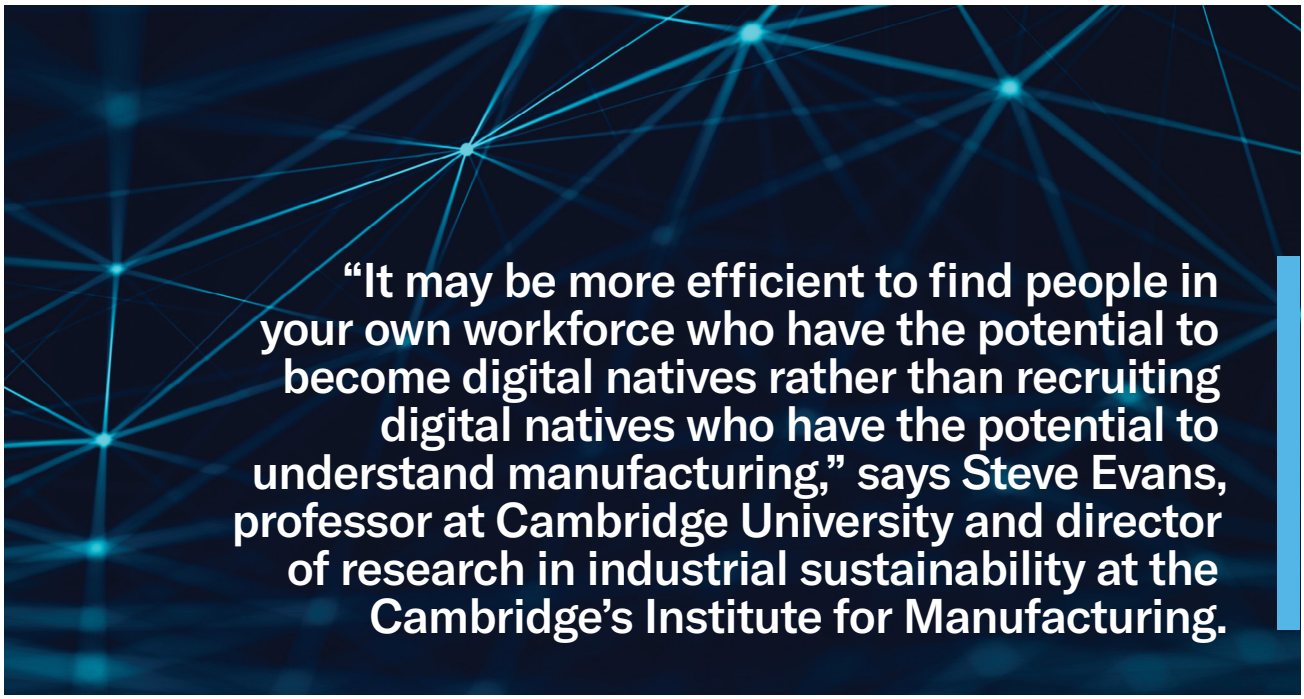

diagram of people with those competencies overlaps, but manufacturing firms are facing a digital competency gap.”

Evans believes that manufacturers would do well to upskill their people to overcome this talent challenge. “There are plenty of data analysts out there, but they don’t understand manufacturing,” he says. “It may be more efficient to find people in your own workforce who have the potential to become digital natives rather than recruiting digital natives who have the potential to understand manufacturing.”

Floyd has a different perspective, believing that a young, digital-savvy generation holds the key to the manufacturing sector’s talent crunch. “The ‘Great Resignation’ is evident in manufacturing, and it’s hard to recruit people because there is a critical discrepancy between the career objectives of the new generation and the jobs available,” he asserts. “This discrepancy is partly due to the legacy technical and IT environments that are still operational in many factories. Cloud platforms can help manufacturers innovate both business processes and models while attracting new developers that are more comfortable with low-code and no-code platforms and analytical tools. Furthermore, there are plenty of digitally savvy graduates who want to bring their skills to bear on many aspects of manufacturing, from product design to solving problems within production processes, supply chains, or logistics.”

Manufacturers have taken a variety of approaches to secure the talent they need. Stellantis created a software and data academy to reskill or upskill its engineers. Trane Technologies, meanwhile, offers an accelerated development program to college graduates, providing them with work experience that involves doing rotations through different areas of the company. Trane Technologies also provides training programs for employees who want to learn more about innovation and new technologies.

At Chemours, Abbott believes in upskilling all employees as an integral part of the company’s transformation program. “With 6,400 employees, it is clear to me that we must invest in training and digital upskilling. Training doesn’t have to be about coding or using sophisticated software tools, but everyone across the company needs to understand how data is presented to them, to be able to interact with it and incorporate it into their daily routines and decision making,” he says. “For instance, our chemical operators and engineers could better understand how to adjust machinery settings based on relevant, real-time data about the production process—temperatures, pressures, defects, and so on. Of course, a small group of data scientists and highly trained data analysts will tackle the really high-value projects, but I think there’s even more value to be realized with the whole organization making data-driven decisions.”

The Future Is Data-Intensive

In today’s world, data is ubiquitous, and manufacturers are reaping the benefits of enhanced digital capabilities in production and across the organization to make better use of

all the data they have—and to harness new data streams, which only continue to emerge. Manufacturers are already scaling emerging concepts such as blockchain, dedicated software entities, and smart factory concepts, including digital twins and the use of predictive maintenance to respond to market conditions by improving operations. And many have gone further by forging new business models and enhanced value propositions that provide new sources of revenue and elevate the customer experience.

Experts and practitioners agree that most manufacturers are facing a digital competency gap that organizations are taking steps toward addressing by hiring new talent and upskilling their people.

Although some manufacturers may be hesitant to embark on similar bold initiatives, the dangers of not doing so not only outweigh the time, effort, and investment required to catalyze change but also pose a risk to the survival of the business.

Customers' expectations are changing, and companies that harness the power of digital to provide better customer experiences may pull ahead.

"Companies that embark on digital-led business transformation may find that it's not as hard as the fearmongers thought it would be," Evans says. "But neither is it as easy as the evangelists might suggest. Companies have to get a lot of things right—and in the future, right is different. But one thing is certain: the future is data-intensive."

ABOUT WIPRO

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