SPOTLIGHT

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The manufacturing industry continues its evolution into Industry 5.0. Driving scalability, efficiency, and productivity through preconfigured solutions and industry best practices can help manufacturers simplify their journey and maintain their competitiveness.

Empowering Manufacturing Growth with Composable Preconfigured Solutions

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Introduction

The manufacturing industry has undergone significant transformations over the past few decades, evolving from the traditional methods of Industry 1.0 to the advanced, interconnected systems of Industry 4.0. Now, as we stand on the brink of yet another industrial evolution, the concept of Industry 5.0 is emerging, promising to reshape the manufacturing landscape through a human-centric approach that involves harmonizing advanced technologies with human creativity and expertise. At its core, integrating real-time data analytics into manufacturing processes is a transformative force, enabling manufacturers to harness actionable insights, driving informed decision-making that optimizes workflows and resource allocation. This transformation is not just about adopting new technologies; it's about creating a unified manufacturing platform that seamlessly integrates every aspect of the manufacturing process, from design to delivery through technology and its workforce.

AT A GLANCE

KEY STAT

Investments in automation, including GenAI and skills enhancements for employees, are top 2 priorities for manufacturing leaders.

WHAT'S IMPORTANT

Leaders are prioritizing investments in emerging technologies to ensure competitiveness and drive strategic decisions.

KEY TAKEAWAY

Composable, modular, plug-and-play systems offer organizations the ability to scale to meet business needs.

The drive toward a more flexible, efficient, and responsive manufacturing environment is at the heart of this evolution. The introduction of technologies such as the Internet of Things (IoT), cloud computing, big data analytics, and artificial intelligence (AI) has paved the way for unprecedented levels of automation and connectivity within the shop floor and out in the field to enhance worker productivity and customer experience. This digital integration enables real-time data exchange and analytics, optimizing processes and maximizing efficiency across the entire value chain to increase revenue for manufacturing companies.

The significance of a unified manufacturing platform represents the culmination of years of technological advancement, offering a holistic view of the manufacturing process that breaks down silos and fosters collaboration across departments. By leveraging cloud-based platforms and preconfigured solutions where appropriate, manufacturers can maximize supply chain throughput by using secure and reliance connectivity across the entire organization.

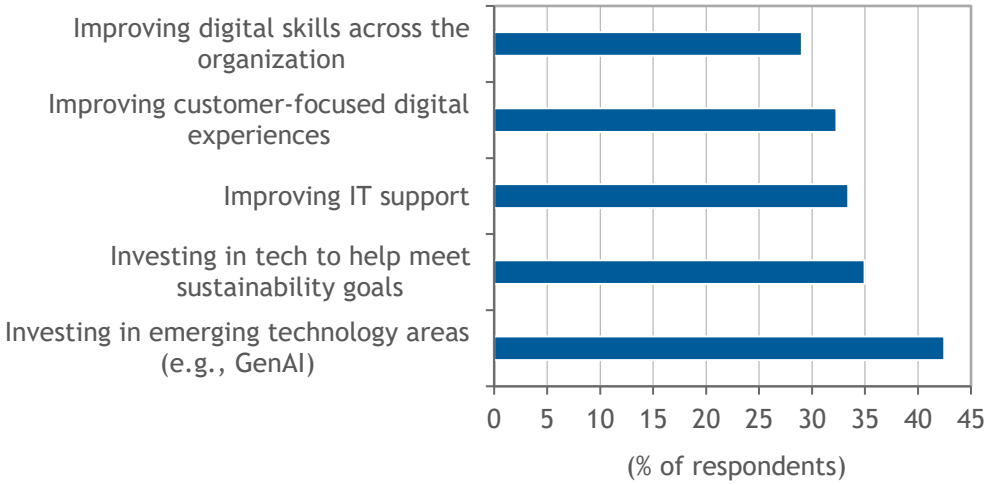
Driving Scalability and Growth Through Composable and Easy-to-Integrate Preconfigured Solutions

With the fast-paced advancements in technology, leaders are challenged with competing investment IT priorities, with scalability and growth being critical factors for maintaining competitiveness and meeting dynamic market demands. Traditional monolithic systems often struggle to keep pace with evolving requirements due to their rigidity and complexity. Composable and easy-to-integrate preconfigured solutions offer a transformation approach that enabled manufacturers to scale efficiently and effectively to drive sustained growth.

As shown in Figure 1, leaders are prioritizing investments in emerging technologies to ensure competitiveness and drive strategic decisions. Composable, modular, plug-and-play systems offer organizations the ability to scale to meet business needs. With high interoperable capabilities enabled by such a system, companies can empower their workforce and drive collaboration and automation. From an infrastructure perspective, it is important to note that enabling generative AI (GenAI), machine learning (ML), digital twins, and other emerging technologies requires cloud applications, which further drives the need for cloud migration or investments in cloud technologies.

FIGURE 1: ***Top 5 Technology Priorities for Manufacturing Organizations***

Q What are your organization's top technology priorities for the next 12 months?



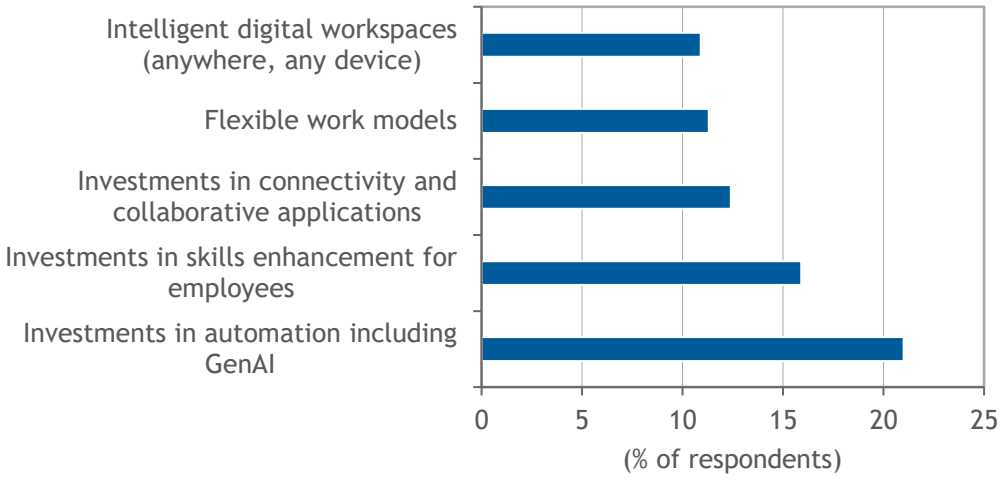
n = 121

Source: IDC's C-Suite Survey, September 2023

As organizations continue their digital transformation journey, they are focused on enhancing decision-making to drive higher operational efficiency levels and support digital customer engagement applications achieved through investments made in automation, skills enhancements for their workers, and improved connectivity and collaboration tools (see Figure 2). With investments made across a wide range of priorities, preconfigured solutions significantly reduce the time and complexity involved in deployments resulting in faster time to value, critical in today's highly competitive environment where speed and efficiency are paramount.

FIGURE 2: ***Top Areas of Investment***

Q ***In the face of current market disruptions, which of these work practices and technology investments is most relevant to your organization's business growth?***



n = 133

Source: IDC's Future Enterprise Resiliency and Spending Survey, Wave 3, March 2024

Benefits

Composable and easy-to-integrate preconfigured solutions offer a strategic advantage for manufacturers aiming to scale their operations and drive growth. Developed with industry best practices in mind, these solutions are optimized for common manufacturing operations and requirements. This not only shortens implementation timelines but reduces the risk of integration errors and operational disruptions.

There are a multitude of preconfigured offerings in the market catering to various manufacturing needs. Organizations that desire to drive automation and augment the workforce should consider solutions designed to help workers in field service and on the shop floor streamline processes and drive informed decision-making for leaders.

For field service worker leaders, such a solution can help with:

- **Maintenance request automation:** Streamline service request and work order management to ensure timely response and reduced downtime, ensure compliance with contractual service agreements, and improve customer satisfaction.
- **Scheduling and routing optimization:** Minimize operating costs and maximize field technician efficiency by dispatching the best-suited technician for each task while reducing travel time and distance. This also improves sustainability measures, while reducing expenses related to fuel consumption and vehicle maintenance.
- **Smart location tracking:** Enhance safety, coordination, compliance, and response by tracking field resource location in real time.

- **Service parts management:** Reduce service delays and improve first-time fix rates by ensuring that field service workers have the necessary parts and tools prior to reaching the job site or are able to order and access parts while in the field.
- **Predictive and proactive maintenance:** Use telemetry data and analytics to anticipate potential equipment failures, reduce the need for costly emergency repairs, and extend asset life span through proactive maintenance tasks.

For operation leaders and the shop floor workforce, such a solution can help with:

- **Real-time tracking and tracing:** This feature provides accurate, up-to-date information on asset and materials location and performance.
- **End-to-end visibility:** Both the entire supply chain and shop floor operations are monitored, enabling transparency that helps to drive better decision-making and faster response time to disruptions.
- **Intelligent automation:** Repetitive tasks are streamlined and worker safety enhanced as they are physically distanced from heavy assets and machinery. Workers can focus on more complex, value-added tasks.
- **Customer satisfaction:** Faster response time with more accurate service times and up-to-date information leads to higher retention and positive customer scores.
- **Optimization of the assembly lineside space:** Easy access to necessary tools and components reduces downtime and movement within the shop floor, enhancing overall efficiency and safety.
- **Zero stockout at assembly lineside location:** Maintaining a zero stockout policy at assembly lineside locations prevents delays caused by missing or out-of-stock parts, ensuring workers can complete scheduled and planned tasks with minimal disruptions, driving efficient workflows and service reliability.

Considering TCS Crystallus for Manufacturing on Oracle Cloud

Tata Consulting Services (TCS) has been one of Oracle's strategic partners for more than three decades. TCS' offerings are tailored to both industry and business processes, including consulting, implementation, and managed services, helping businesses to modernize and drive value.

As manufacturers continue their transformation journey to interconnected Industry 4.0, they need a unified team, the support of experienced partners, and easy-to-integrate preconfigured solutions to help drive efficiencies and productivity in this fast-paced competitive landscape.

To help global manufacturers optimize their Industry 4.0 operations and practices, TCS Crystallus for Manufacturing offers a set of preconfigured models tailored to meet specific industry needs. It combines TCS' domain expertise, contextual knowledge, and industry best-practices with ready-to-use Oracle Cloud Applications. This approach brings together capabilities such as process design enablers, preconfigured instances, process documentations, and implementation accelerators to help enable a digital organization. The industry-preconfigured offerings are calibrated to tackle specific industry challenges and help streamline business processes to drive continuous improvement and innovation. This combination leads to faster integration of complex ecosystems and scalability to meet growing business needs with minimal impact on the organization's operations.

While TCS Crystallus offers a multitude of industry offerings, two of its key offerings focus on enhancing operational efficiencies and field service experience and productivity. Their capabilities include:

- **Service logistics:** Automate and optimize the service life cycle by connecting all data, processes, and teams responsible for servicing products or assets on a single platform. This unified approach covers customer support, service request and work order management, service planning, field service execution, spare parts management, subscription and warranty management, and depot repair. Enhance customer satisfaction while increasing service-related revenue, improving service margins, and reducing the cost to serve.
- **Forward broadcasting:** Leveraging Oracle Supply Chain Planning and Execution, manufacturing companies can maximize their supply chain throughput through increased efficiency, streamlined operations, and increasing efficiencies and productivity. By optimizing and streamlining shop floor and assembly-line operations, organizations can reduce errors in their processes and drive productivity and efficiencies in their supply chain.

Challenges

The manufacturing industry is increasingly embracing automation and digital technologies to enhance efficiency and competitiveness. However, this shift brings several challenges, particularly in the areas of automation, real-time visibility, and optimizing operations:

- **Complex integrations**: One of the main challenges of automation is integrating new technologies with existing monolithic legacy systems. Often relying on a mix of legacy and modern equipment and technologies, companies frequently experience fragmented data sources and compatibility challenges. It is important to invest in interoperable solutions and ongoing maintenance to facilitate a more seamless flow of information.
- **Data management and analytics**: Real-time visibility relies heavily on accurate, relevant, and timely data collection and analysis. With the volume of data being generated across multiple platforms and formats, organizations are challenged with collecting and synthesizing the appropriate data to provide actionable insights. It is important for manufacturing companies to implement robust data management systems to handle the influx of data to drive meaningful insights.
- **Balancing efficiency and flexibility**: Optimizing manufacturing operations through automation often emphasizes efficiency but can often hinder flexibility. Traditional automated systems are typically designed to be task specific, making reconfiguration for new products or services quite challenging. Organizations should explore adaptive manufacturing systems that can maintain high efficiency levels to allow for flexibility and scalability to enable rapid changes in production to meet market demands and customization needs.

As such, organizations should evaluate each of the TCS Crystallus offering road maps and plans along with the planned investments TCS has allocated toward innovation and future enhancements. The opportunity for TCS Crystallus and other firms will be to help manufacturers navigate through the excitement of the current innovative technologies to understand their needs through a use case approach, while also considering their existing environment and maturity. As convenient and easy to integrate as the preconfigured Oracle offerings are, the technical integration effort and support will be equally important. Here is where service firms can play the role of strategic partners to ensure implementation and adoption success.

Conclusion

In conclusion, the rise of composable offerings in manufacturing is a testament to the industry's shift toward more agile, scalable, and technologically integrated operations. By embracing these offerings, manufacturers can position themselves for sustained growth and competitiveness in an increasingly complex and fast-paced industry landscape. Preconfigured offerings offer a beacon of hope for manufacturers aiming to navigate the complexities of modern production landscapes. These offerings, designed with industry best practices, significantly shorten implementation timelines, reduce integration errors, and minimize operational disruptions. Preconfigured offerings are not just about technology implementation; they are about empowering manufacturers to achieve operational excellence and sustainable growth in an increasingly competitive and complex industry.

About the Analyst

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Sarah Lee is a research director for IDC Manufacturing Insights responsible for the IT Priorities and Strategies (ITP&S) practice. Sarah's core research coverage includes IT investments made across the manufacturing industry and manufacturers' progress with digital transformation. Based on her background covering the manufacturing space, Sarah's research also includes an emphasis on the technology enablers that help manufacturing executives make better informed operational decisions.

MESSAGE FROM THE SPONSORS

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Tata Consultancy Services (TCS) is an IT services, consulting and business offerings organization that has been partnering with many of the world's largest businesses in their transformation journeys for over 56 years. TCS has over 601,000 of the world's best-trained consultants in 55 countries. The company generated consolidated revenues of US $29 billion (FY 2024).

TCS and Oracle have a long-standing strategic partnership helping clients across manufacturing industries realize value from their business transformation initiatives. TCS Crystallus for Manufacturing on Oracle Cloud, a set of pre-configured business offerings tailored to manufacturing sub-verticals, helps enterprises accelerate time to market with intelligent, automated and scalable offerings. With Oracle Cloud at its core, it enables an ecosystem operating model and simplifies the cloud transformation journey by automating processes, connecting disparate systems, and leveraging next-gen technologies to facilitate data-driven decisions with actionable insights.

IDC Custom Solutions

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