Leveraging AI/GenAI in Manufacturing for Efficiency and Accuracy at Scale

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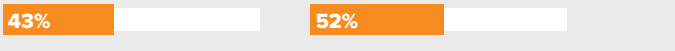
AI is swiftly reshaping manufacturing, enabling industrial transformation and turning future potential into today's reality. Manufacturing companies in the Asia/Pacific region state that 78% are using AI, while 54% are utilizing Generative AI (GenAI) technology.

Top 5 Industry AI/GenAI Use Cases in Manufacturing

- AI-powered Quality and Compliance
- Augmented Planning and Logistics
- Augmented Product Requirements, Design & Collaboration
- Augmented Connected Maintenance (including digital twins)
- Augmented Product R&D (including Digital thread for better digital twins)

The rise of AI and GenAI in manufacturing is ushering in a transformative era for Asia/Pacific's industrial landscape. Countries like Japan, India, South Korea, and emerging powerhouses in Southeast Asia/Pacific, home to some of the world's largest manufacturing hubs, are rapidly integrating these advanced technologies into their production processes. This transition to smart manufacturing is fostering more flexible production lines, enhancing precision, and opening new opportunities for automation and robotics. The technological revolution is reshaping traditional manufacturing, driving enhanced efficiency, unprecedented customization, and scalable innovation. From predictive maintenance and quality control to the development of smart and lights-out factories, AI is helping Asia/Pacific organizations adapt to evolving global standards and competitive pressures, positioning them to stay ahead in a rapidly changing environment shaped by the Fourth Industrial Revolution.

Extent to which Asia/Pacific manufacturers believe GenAI will disrupt their competitive position or business operating model in the next 18 months



Disrupting Now

Will Disrupt in next 18 Months

Source: IDC's Worldwide AI and Generative AI Spending Guide 2024 | Aug (V2 2024) Forecast

*Source: IDC FERS Wave 1 – 2024 (Asia/Pacific n = 300, Asia/Pacific Mfg. n = 38)

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GenAI in Manufacturing

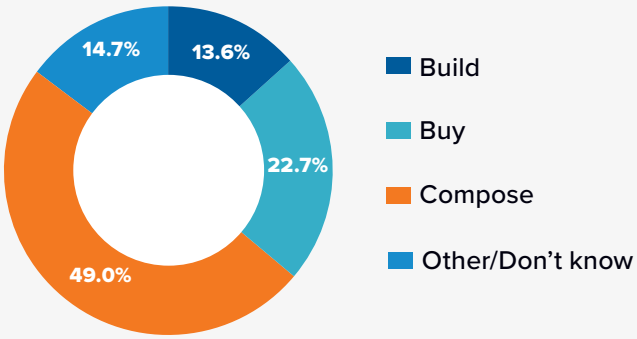
GenAI is fundamentally reshaping the manufacturing sector through three critical dimensions: skill augmentation, demand sensing, and predictive analytics. In the context of Industry 4.0, manufacturers leverage GenAI to process massive data volumes, enabling sophisticated planning, forecasting, and quality and safety assurance. Real changes are visible on factory floors: instead of needing specialized engineers to fix problems, operators can now use AI-enabled systems to solve issues directly. Organizations that integrate GenAI gain a competitive edge, lower costs, improve productivity, and quickly respond to market demands. This shift fundamentally redefines the manufacturing model, making data-driven decision-making and human-AI collaboration essential for staying relevant in Asia/Pacific's diverse manufacturing landscape.

GenAI Adoption Approach in Manufacturing

Manufacturers prefer composing their own generative AI solutions (49%) because it offers flexibility, cost savings, greater innovation, and better operational efficiency. By building their own solutions, manufacturers can mix and match components from different vendors, customizing them to fit their unique needs. This approach is especially valuable in manufacturing, where requirements can vary greatly depending on product lines and processes.

While the "Build" approach provides more control and long-term customization, the "Buy" option offers quicker deployment and the advantage of using proven, ready-made solutions.

GenAI Adoption Approach in Manufacturing



Compose: fine-tuning an existing GenAI model (usually open source) on top of an enterprise AI platform.

Build: developing a foundational model using institutional data.

Buy: leveraging enterprise applications with GenAI capabilities or native GenAI applications.

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Top GenAI Use Case Areas by Function in Manufacturing

01	**Supply Chain: Network Design —** Service level agreement optimization and insights for network design
02	**Sales: Prospecting and Lead Generation —** Predictive lead scoring and personalized digital interactions
03	**HR: Recruitment and Talent Acquisition**
04	**Facilities: Enhanced Workplace and Property Management —** Connected maintenance with digital twin models for performance predictions
05	**Engineering/R&D: Product Collaborations —** Developing digital threads and generative ecosystem development

Conclusion

The future of AI/GenAI in manufacturing is promising, with the potential to boost productivity, cut costs, and support sustainable practices. According to IDC, by 2028, the integration of AI and ML into robotics and automation in industrial operations across Asia/Pacific will grow by 30%, leading to greater efficiency and a 10% reduction in downtime. As AI automates tasks and enhances operations, manufacturers will increasingly adopt AI/GenAI for autonomous processes, leading to further innovation in the industry.

Source: IDC WW AI Use Case Survey, July 2024 (Asia/Pacific n = 919, Asia/Pacific Mfg. n = 76)

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