



Manufacturing Vision Study

# In Pursuit of Excellence

Intelligent Automation for  
Superior Quality and Efficiency

Manufacturers are pushing the boundaries of digitalization to achieve competitive differentiation. Explore how intelligent automation solutions like machine learning and artificial intelligence are revolutionizing the industry. Discover how these advancements minimize risk and maximize productivity.

**Learn how you can elevate efficiency and agility to achieve manufacturing excellence.**

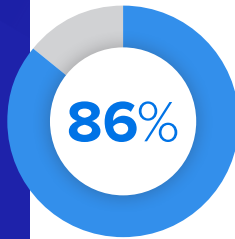


# Leveraging Automation for Manufacturing Excellence

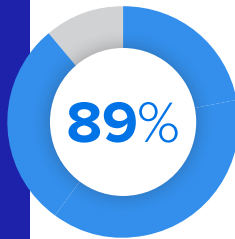
Manufacturers are confronting the complexities brought about by rapid advancements in factory automation. The need to digitize, improve operations and stimulate strategic growth highlights the urgency of staying ahead in a continually evolving landscape. Industry leaders are concentrating on enhancing performance, building resilience and strengthening supply chain ecosystems to maintain their market advantage.

## Racing to Keep Up: Manufacturers Struggle with Pace and Costs of Tech Innovations

Percentage of decision-makers agree



The pace of technological innovations is accelerating at a rate that their organization is struggling to keep up



Digitization projects are time, cost and labor-intensive upfront with a long window before realizing Return on Investment (ROI)



## Key Manufacturing Areas Requiring Operational Improvements



1 Inventory Management Tracking and Movement



2 Asset and Facility Management



3 Inventory and Materials Management, Quality Assurance



4 Supply Chain Visibility



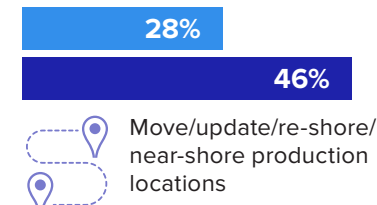
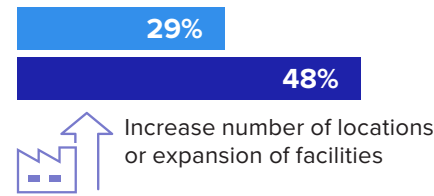
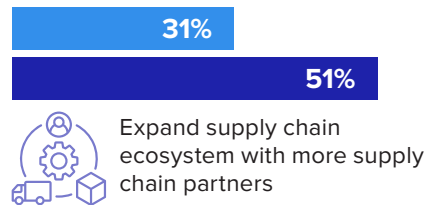
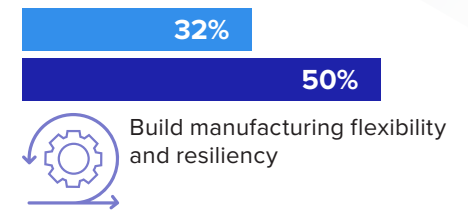
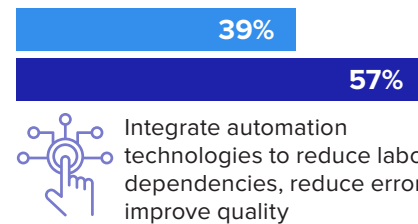
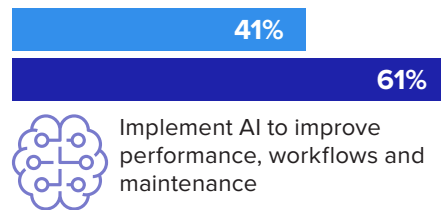
5 Mobile Human-Machine Interface (HMI)



6 Process Compliance, Work in Process Tracking

## Strategic Growth Blueprint: Core Operations and Technology Plans

Decision-makers weigh initiatives crucial to advancing their business growth strategies



2024 2029

# Chasing Efficiency: Progress and Precision in Manufacturing

Global manufacturers are increasingly leveraging advanced technologies to enhance productivity and meet the changing demands of a dynamic market. The benefits of digital transformation are evident, optimizing labor use, boosting service levels and increasing overall efficiency. However, significant challenges persist, particularly in the deployment and scaling of these innovations, which can impede progress.

In the pursuit of automation, manufacturers across the C-suite, Information Technology (IT) and Operational Technology (OT) are confronted with critical challenges, including demonstrating the value and effectiveness of new technologies. Realizing a positive return on investment quickly is imperative to justify the costs and sustain momentum. Many also grapple with formulating the right strategic approach for their organizations while managing the complexities of long-term technology deployment and scaling.

IT leaders often struggle more with strategic alignment, whereas C-suite decision-makers emphasize the difficulties of integrating new technologies with legacy systems—a process that can widen skill gaps within the existing workforce. Overcoming these obstacles is crucial for manufacturers aiming to achieve both progress and precision, ensuring they remain competitive in an ever-evolving industry landscape.



## Driving Efficiency: Key Motivators for Manufacturing Automation

Focus available associates on “high-value” customer-centric tasks to optimize labor (such as reducing walking)



70%

Meet service level agreements (including order accuracy, turn-around time and customization)



69%

Add more flexibility to physical space / plant floor footprint



64%

Offset labor shortages



50%

Mitigate errors



47%

## Overcoming Hurdles: Key Challenges in Automation Deployment

Percentage of decision-makers ranking item in top three

35% Measure and justify ROI of new technology

34% Need help with determining the right strategy

32% Difficulty in deploying/scaling new technology

31% Long-term service and support of new technology

30% Skill gaps and training staff

# Game-Changers and Visionary Goals

In an era characterized by rapid technological advancements and intense global competition, automation is revolutionizing manufacturing. To stay ahead, manufacturers must enhance their agility. The ability to quickly scale operations in response to fluctuating market demands is vital. This flexibility allows manufacturers to meet customer needs efficiently, manage inventory levels effectively and reduce waste. Adopting cutting-edge technology is crucial for achieving this flexibility and leveling the playing field for manufacturers of all sizes.

Advanced technologies, including IoT and AI, enable real-time monitoring and data analysis, facilitating swift decision-making and resource allocation. Implementing a robust supply chain strategy is also essential, ensuring that businesses can source materials and components rapidly and cost-effectively. By embracing these approaches, manufacturers can enhance their responsiveness, optimize production processes and maintain a competitive edge regardless of market volatility. This approach ensures business continuity and drives sustainable growth.



## Optimizing Operations: Desired Results of Plant Floor Automation

Percentage of decision-makers

**48%**

Provide flexible scale to meet fluctuating demands

**47%**

Increase worker efficiency and productivity

**42%**

Deploy within existing facilities without major infrastructure changes

**42%**

Improve overall competitiveness

**39%**

Reduce production line errors

**39%**

Reduce operational and facility supply spending

## Everyone Claims the Spotlight for Driving Automation: OT Leads the Way with IT Close Behind

Decision-makers identify key functions responsible for accelerating automation



C-Suite Perceptions

**37%** C-Suite is Leading Force

KEY INFLUENCERS:  
OT: **28%** IT: **21%**



IT Perceptions

**46%** IT is Most Responsible

KEY INFLUENCERS:  
OT: **29%** C-Suite: **14%**



OT Perceptions

**48%** OT is Primary Driver

KEY INFLUENCERS:  
IT: **23%** C-Suite: **17%**

## Top Factors Driving Automation Technology Purchases

1

Flexibility to adapt to changes in production volume and complexity

2

Simple/easy to use and reduced training time

3

Safety and security

4

Initial cost and ROI

Compatibility/ease of integration/connectivity

5

Scalability to accommodate growth

# Breaking Boundaries: Bold Steps in Tech Adoption

**Ambitious plans for integrating AI, IoT and 3D vision are propelling the industry toward transformative advancements.** However, many manufacturers mistakenly believe that digital transformation requires an all-or-nothing approach. Instead of a complete overhaul, forward-thinking companies are adopting incremental steps, such as automating specific, repetitive tasks to enhance efficiency without extensive disruption. For example, by implementing cobots or mobile robots, manufacturers can assist workers with heavy lifting and precision tasks, gradually incorporating advanced technology into daily operations.

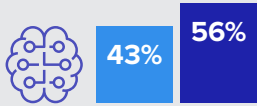
Investing in workforce training is another critical step. By equipping employees with the skills needed to work alongside new technologies, companies can ensure a smoother transition and instill a culture of continuous improvement. Additionally, manufacturers are leveraging analytics for decision-making, beginning with basic data collection and progressively incorporating more sophisticated tools. They are also enhancing digital connectivity through IoT devices in stages, starting with critical equipment and expanding as needed. By taking measured steps, manufacturers can steadily improve productivity, quality and innovation while minimizing risk and resistance to change.



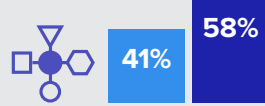
## Automation Leaders and Rising Stars

Percentage of decision-makers planning to implement technology

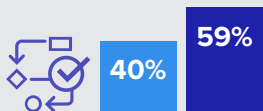
### Decision Automation



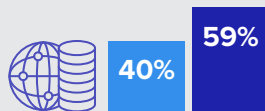
Artificial Intelligence



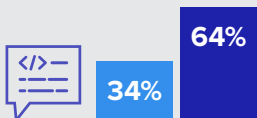
Internet of Things Platform



Prescriptive Workflows

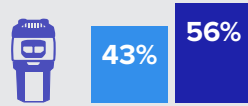


Big Data Analytics

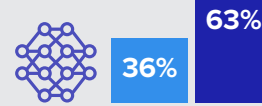


Large Language Models (LLM)

### Process Automation



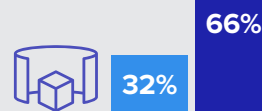
Fixed Industrial Scanners



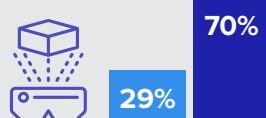
Deep Learning



Machine Learning

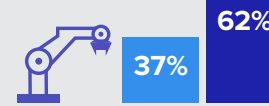


Augmented Reality

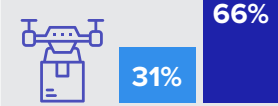


Three-Dimensional (3D) Vision

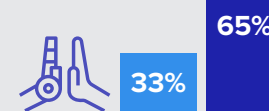
### Physical Automation



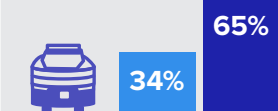
Industrial Robotic Arm



Drones



Cobots



Autonomous Mobile Robots (AMR)

Already using

Plan to implement in 5 years

# Embracing Digital Transformation

Facing increasing competition and shifting market dynamics, manufacturers recognize the urgent need for innovation. The rapid pace of technological advancements and the complexities of integrating new solutions across supply chains present significant challenges. To address these, innovative organizations are partnering with strategic allies to develop tailored digitalization strategies. These collaborations help identify incremental steps for adopting digital technologies, ensuring alignment with existing processes, infrastructures and workforce capabilities. By leveraging these partnerships, manufacturers can navigate digital transformation effectively, enhance their competitive edge, deliver greater value to customers and secure a prosperous future.

## About the Study

Zebra commissioned Azure Knowledge Corporation to conduct 1,200 online surveys among C-suite executives as well as IT and OT decision-makers across various manufacturing sectors. Respondents were surveyed in Asia, Europe, Latin America and North America.

### Introduction to Series

Zebra's 2024 Manufacturing Vision Study addresses enterprise trends, challenges and priorities industry executives face in transforming the plant floor while gauging their outlook on technology drivers for deployment and spending as they work to digitally evolve their organizations. The results are summarized in a three-part series:



**The Power of Actionable Visibility**  
Transforming Manufacturing for the Digital Age



**The Future Workforce**  
Where Innovation Meets Productivity



**In Pursuit of Excellence**  
Intelligent Automation for Superior Quality and Efficiency

To view the Manufacturing Vision Study series, visit [zebra.com/manufacturing-vision-study](https://zebra.com/manufacturing-vision-study)

## About Zebra Technologies

Zebra (NASDAQ: ZBRA) helps organizations monitor, anticipate and accelerate workflows by empowering their frontline and ensuring that everyone and everything is visible, connected and fully optimized. Our award-winning portfolio spans software to innovations in robotics, machine vision, automation and digital decisioning, all backed by a +50-year legacy in scanning, track-and-trace and mobile computing solutions. With an ecosystem of 10,000 partners across more than 100 countries, Zebra's customers include over 80% of the Fortune 500.

Explore how Zebra can revolutionize your manufacturing operations, enhancing efficiency, productivity and competitive edge. Visit [zebra.com/manufacturing](https://zebra.com/manufacturing)



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