






Certifying AI Skills and Knowledge

of Frontline Manufacturing Technicians

MSSC™
Manufacturing Skill Standards Council

AMATROL®

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Definition of AI

A machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments (NIST).

AI Impact on Employment

"While many businesses use AI to replace worker tasks and existing equipment/software, there is little evidence that AI use is associated with a decline in firm employment. In fact, an increase in employment because of AI use is more common than a decrease." (U.S. Census Bureau 2023)

Industrial AI

The application of AI in an industrial setting is focused on harnessing real-time data to feed learning processes that can predict, automate, and interpret actions from large and complex data sets. (Rockwell Automation. [2025]. *10th Annual State of Smart Manufacturing Report* [p. 25]).



Importance of AI to U.S. Manufacturing

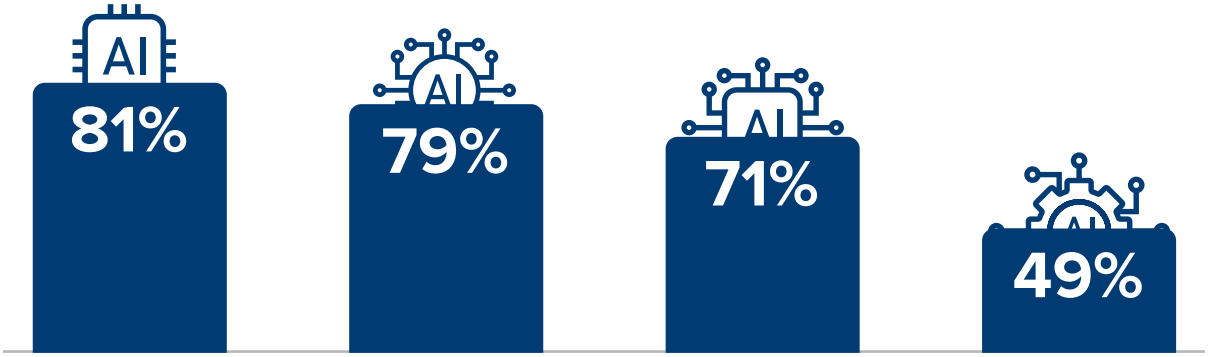
Vast potential to increase productivity growth, reshore manufacturing, increase global competitiveness, and strengthen the nation (Reshoring Initiative).

AI Trends in the Manufacturing Sector

A rapid surge in AI use within the manufacturing sector—**from 59% adoption in 2024 to nearly total adoption projected within two years** (Survey of 125 C-Suite Manufacturing Leaders, Innova 2024).

68% of manufacturers state that AI will be foundational to future competitiveness (Manufacturing Leadership Council, *Survey Report 2025*)

Corporate AI Leadership Hierarchy



C-Suite have AI engagement

Senior plant leadership have AI engagement

Departmental/ functional **leaders** have AI engagement

Factory floor **supervisors/ team leaders** have AI engagement – 'Alarmingly Low'

AI Global Manufacturing Outlook

95%

have invested in or plan to invest in AI within the next five years.

AI/ML ranked #1 among technologies used to address the labor shortage.



55%

plan to use AI/ML for quality control within the next 12 months.

** Rockwell Automation, Annual State of Smart Manufacturing Report 2025. Survey of 1,500 leaders in global manufacturing*

MSSC Focus on Certifying Front-line Manufacturing Technicians

Nation's "Gold Standard" for certifying front-line technicians—entry-level up to front-line supervisors—in industry-wide core technical competencies, including AI.

- For 28 years, committed to keeping pace with technological change.
- In 2019 we first added AI to MSSC's extensive list of advanced manufacturing technologies.

We placed it at the head of a set of nine newly emerging "Industry 4.0" digital technologies": AI, 5G, 3D, Industrial Internet of Things (IIOT), Autonomous Robots, Augmented Reality, Nanotechnology, Data Analytics, and Advanced Materials.

Rather than preparing individuals to be specialists in any specific technology, the goal was to provide a basic understanding of technologies relevant to their work on the factory floor.

To incorporate these nine into our signature **Certified Production Technician (CPT)** program, we prepared one-page overviews for each—including AI.



MSSC AI Study Group

- Formed in May 2024; chaired by Leo Reddy, MSSC President & Co-Founder.
- Expanded the list of AI skills and knowledge needed by front-line production technicians.
- Help MSSC decide whether, when and how to expand certifications of AI Skills and Knowledge of Frontline Manufacturing Technicians.

Key role of Amatrol Courseware

One of our Study Group members is Paul Perkins, President of Amatrol and lead provider of online courseware to MSSC. Amatrol is a global leader in career and technical education (CTE) training solutions and in the production of manufacturing training equipment. Paul is in the process of identifying specific AI items that might be added to the MSSC's signature Certified Production Technician (CPT) program.

AI Support from President Trump

- On April 23, issued an Executive Order titled: "Preparing Americans for High-Paying Skilled Trade Jobs of the Future."
- Its goal is to "fully equip the American worker to produce world-class products and implement world-leading technologies."
- AI is included in the list of priority technologies.

Study Group Members

- Paul Aiello, FANUC America Corporation
- Bill Bonvillian, MIT
- Samuel Bottum, Snap-on Inc.
- Jan Bray, Bray Strategies
- Erica Case, Harley-Davidson Motor Company
- Jon Gustafson, Lockheed Martin Corporation
- Kendall Hawkins, Rockwell
- Phil Jones, Target Corporation
- Tyler Kennedy, MSSC
- Kate Kreamer, Advance CTE
- John McFetridge, Software Consultant
- Craig McAtee, NCATC
- Harry Moser, Reshoring Initiative
- Paul Perkins, Amatrol Inc.
- Rich Ramey, A3
- Neil Reddy, MSSC
- Todd Round, IBM Consulting (ret.)

List of AI Focus Areas

Study Group identified 20 functions within manufacturing that were the priority focus areas for AI:

1. Quality Control and Error Reduction
2. Worker Safety
3. Robotics & Automation
4. Mass Customization
5. Real-time Adaptability
6. Scheduling
7. Delivery Deadlines and Order Prioritization
8. Material Availability and Just-in-time Inventory Management
9. Machine Utilization and Maintenance Scheduling
10. Minimization of Changeover and Setup Costs
11. Real-time Adaptability
12. Data Literacy
13. Predictive Maintenance and Process Optimization
14. Programming and Coding Awareness
15. Human-machine Collaboration
16. Cyber-security Awareness
17. Problem-solving and Critical Thinking
18. Continuous Learning
19. Communication Skills
20. Ethical AI



Global Competition

- East Asia Leads in AI Manufacturing
- China and South Korea are rapidly deploying AI across their manufacturing sectors—setting a new global benchmark and challenging reshoring efforts in the West.
- China operates over 30,000 smart factories.
- Leading firms like Xiaomi and BYD outperform Western rivals through fully automated, AI-powered production lines. (The Diplomat, “The Rise of AI Manufacturing in China and South Korea,” May 2025)
- These developments heighten the urgency of preparing the U.S. front-line workforce with AI skill sets.

MSSC Conclusion

- MSSC has concluded that it is time to further expand the AI content within its CPT certification program.

These offerings will motivate and equip factory floor production technicians to enhance their use of AI in operations.

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