LEAN THINKING IN THE AGE OF AUTOMATION

Lean Principles for AI and Automation

Matt Paison - Webinar 9/18/2025

MANUFACTURING EXTENSION PARTNERSHIP National Network

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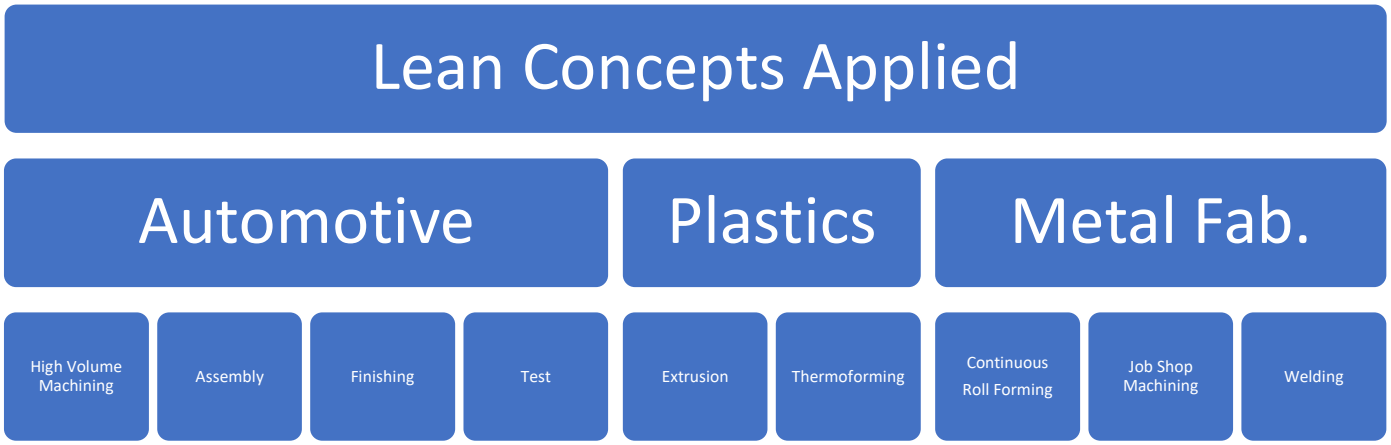
INTRODUCTION

Matt Paison

Strategic Continuous Improvement - Technical Specialist

BACKGROUND

+25 Years in Various Industries



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SETTING THE STAGE

We’re not here to choose between lean and automation – we’re here to understand why it’s important to use them together.

Question: What’s your biggest challenge with automation today?

INDUSTRY REPORTS SHOW

Top 5 Challenges to Automation Integration

1. System Integration Complexity
2. Workforce Shortages and Skill Gaps
3. High Upfront Costs
4. Lack of Real-Time Data
5. Cybersecurity and Operational Risk

UNDERSTANDING THE MODERN MANUFACTURING LANDSCAPE

THE NEW MANUFACTURING LANDSCAPE

Impact of AI and Automation

AI, automation and machine learning are transforming manufacturing through smart factories and autonomous systems.

Efficiency and Scalability Benefits

These technologies improve operational efficiency and scalability but also bring new complexities and risks.

Importance of Stable Processes

Stable and efficient processes are essential to successfully adopt advanced manufacturing tech and avoid amplified inefficiencies.

LEAN PRINCIPLES IN A HIGH-TECH WORLD

LEAN THINKING: STILL THE FOUNDATION TO BUILD ON

Systematic Waste Elimination

Lean thinking focuses on systematically identifying and eliminating waste to improve operational efficiency.

Flow Improvement

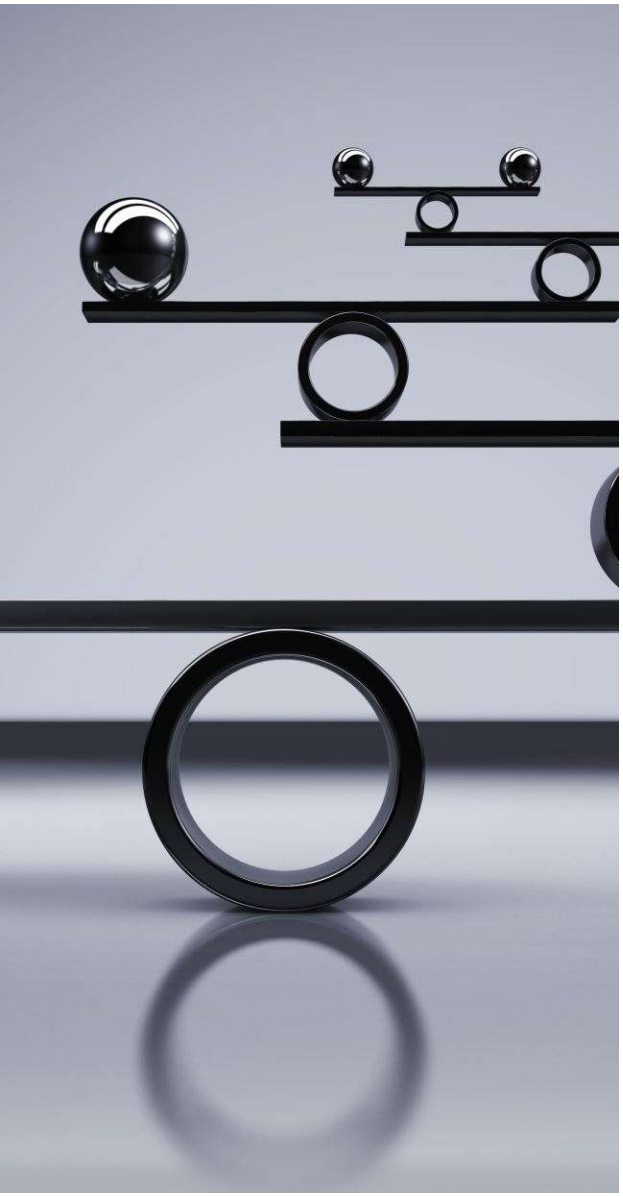
Improving flow in all processes is central to lean, enabling smoother operations and reduced delays.

People Empowerment

Lean empowers workers by involving them in continuous improvement and decision-making process.

Technology-Agnostic Principles

Lean principles support and enhance technological implementation across diverse environments.



AUTOMATION ALONE ONLY MAGNIFIES PROBLEMS

Automation Risks

Automating flawed processes will accelerate failures and spread errors quickly across systems.

Garbage In, Garbage Out

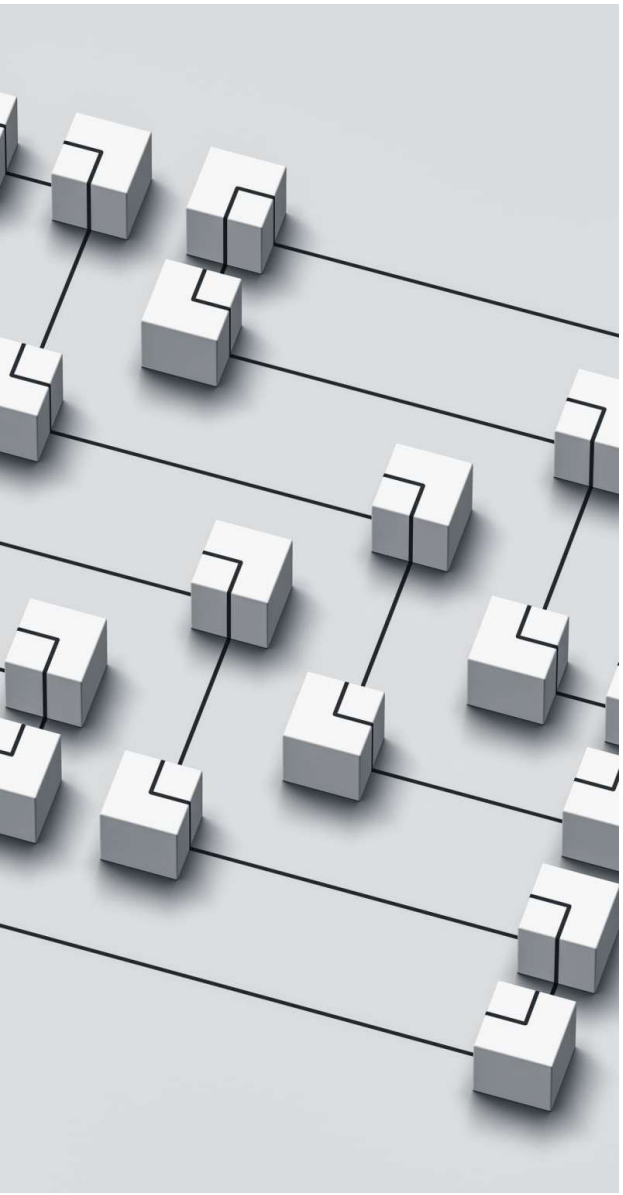
Poor input quality leads to magnified inefficiencies when automation scales flawed data or processes.

Lean Process Practices

Root cause analysis and process standardization help identify and fix issues before automating processes.

Preparing for Automation

Addressing problems early ensures smoother automation implementation and prevents problem escalation.



INTEGRATING LEAN IN HIGH-TECH ENVIRONMENTS

Lean Methodologies in Automation

Applying lean tools such as Standard Work, Visual Management, and Poka-Yoke improves automated manufacturing outcomes.

Case Example: Andon Systems

Andon systems in automated lines boost responsiveness and quality control through real-time alerts and problem solving.

Designing Lean Automation

Frameworks for lean-focused automation ensure technology supports smooth operational flow and efficiency.

Blending Lean and Automation

Combining lean principles with automation creates resilient, efficient manufacturing systems that quickly adapt to change.

LEAN TOOLS AND AUTOMATION

	Standard Work / Leader Standard Work	5S	Value Stream Mapping	Daily Management	Problem Solving	Visual Management and Andon Systems
Before Automation	Stabilize and standardize processes	Organize workplaces and reduce redundancy	Visualizes and optimizes the process flow	Track and respond to performance	Find and fix root cause issues	Highlight issues visually
Alongside Automation	Maintain consistency and oversight	Maintain clean environments and highlight errors	Further visualize and optimize flow of automation	Monitor system metrics	Resolve system issues	Enable real-time alerts

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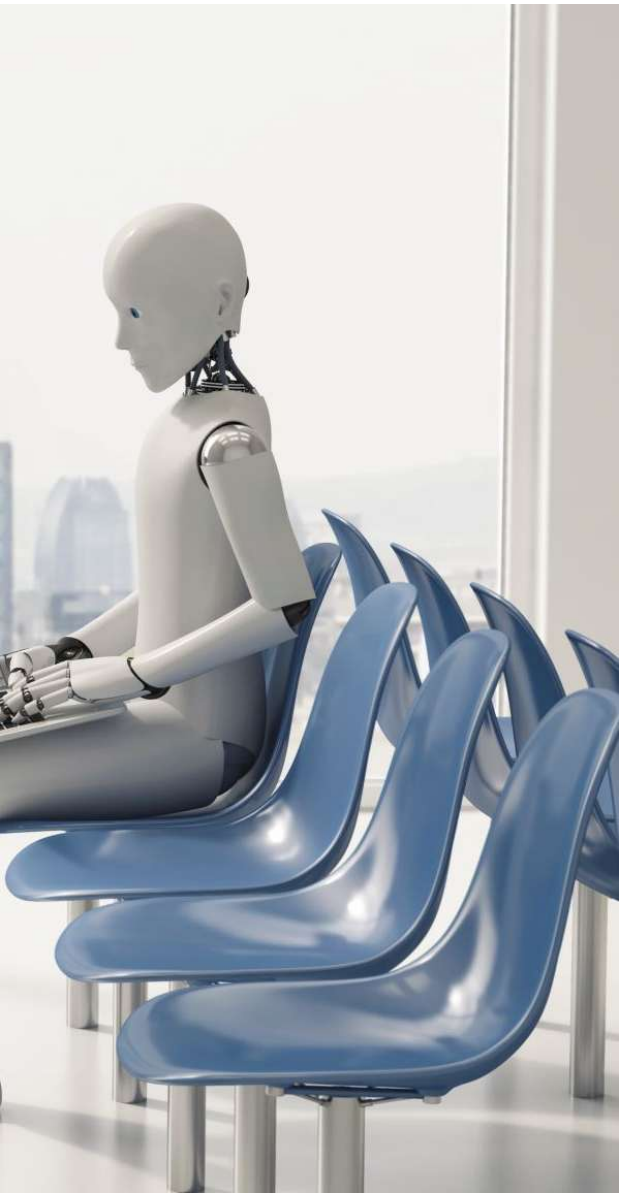
EMPOWERING PEOPLE IN AUTOMATED SYSTEMS



PEOPLE POWER IN AN AUTOMATED WORLD

Human Value in Automation

Human problem-solving and creativity remain irreplaceable despite automation growth.

Empowering Teams

Empowering employees to collaborate with technology enhances operational excellence.

Culture of Learning

Building adaptability and continuous learning culture is vital for leveraging automation.

Sustaining Success

Recognizing human elements ensures technology leads to sustainable organizational success.

CONCLUSION

LEAN TOOLS TO ADDRESS AUTOMATION CHALLENGES

Challenge	Lean Solution
1. System Integration Complexity	Value Stream Mapping Standard Work Visual Management
2. Workforce Shortages and Skill Gaps	Leader Standard Work Daily Management Problem Solving
3. High Upfront Costs	Kaizen (Continuous Improvement) Value Stream Mapping 5S
4. Lack of Real-Time Data	Andon Systems Visual Management Daily Management
5. Cybersecurity and Operational Risk	Standard Work Poka-Yoke (Error Proofing) Problem Solving

Thank You!

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Lean Websites

Google “lean manufacturing” ~10,000,000 results

www.lean.org

www.epa.gov/lean/lean-and-six-sigma-process-improvement-methods

www.nist.gov/mep

Etc…

Recommended Readings

- *Lean Thinking* by Jim Womack
- *Becoming Lean* by Jeffrey Liker
- *The Machine That Changed the World* by Jim Womack and Daniel T. Jones
- *The Goal* by Eli Goldratt
- *World Class Manufacturing: The Next Decade* by Richard Schonberger
- *Creating a Lean Culture* by David Mann

Top Lean Websites

http://www.shingoprize.org **(Shingo Prize for Excellence)**

www.lean.org **(Lean Enterprise Institute-LEI)**

http://www.lean-biz.com **(Lean Business Solutions)**

http://www.flowvision.com/ **(Flow Vision Consulting Group)**

www.superfactory.com **(Global Manufacturing Excellence)**

www.sme.org **(Society of Manufacturing Engineers)**

www.nwlean.net **(NorthWest Lean Working Group)**

www.productivityinc.com **(Productivity Press)**

http://web.mit.edu/lean/ **Lean Aerospace Initiative (LAI)**

http://www.gemba.com/ **(Gemba Research & Consulting Services)**