



Closing the Engineering Skills Gap: Onboarding, Upskilling & Machine Learning

April 8, 11:00 AM – 12:00 PM

Closing the Engineering Skills Gap: Onboarding, Upskilling & Machine Learning



Dan Sloan, moderator

Director of Industry & Workforce Partnerships
SME



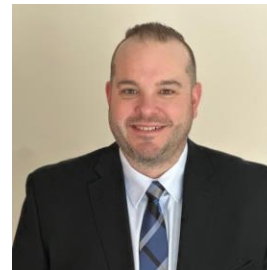
Geoff Lipnevicious

Senior Manager, Organizational Effectiveness
The Lincoln Electric Company



Thomas Deslongchamps

Director of Training & Continuous Improvement
Pindel Global Precision



Derek Anti

Global Director of Manufacturing Engineering
Machining Category
Cummins

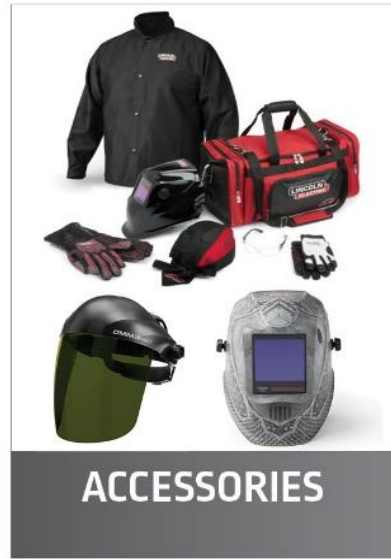
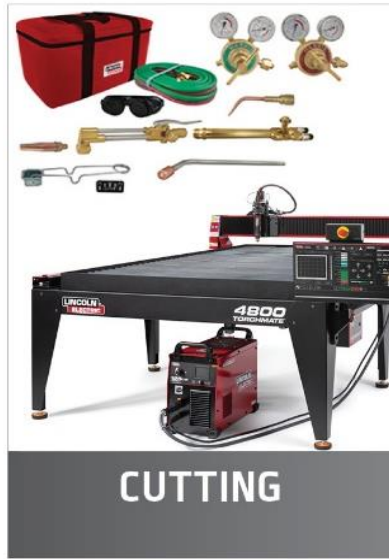


sme
fusion

THE MANUFACTURING WORKFORCE EVENT



Closing the Engineering Skills Gap:
Onboarding, Upskilling &
Machine Learning in Training



The Lincoln Electric Company



- World Headquarters – Cleveland, Ohio
- Founded in 1895
- 71 Mfg Facilities, 21 Countries
- 11,000 Employees



Product Innovation



Workforce Development



Shortage of Talent

- Engineers
- Technologists
- Technicians

Impact

- Reduced Productivity
- Strain on Existing Teams
- Slower Innovation



Educational Partners with Associate Degree programs applicable to your field of interest

	Technician Roles at Lincoln Electric																						
	Additive Solutions	Application Engineering	Automation Production/Build Floor MET	Automation Service	Chemical Testing	Consumable Compliance	Environmental Safety Support	Facilities Engineering	Machine Research & Development	Maintenance	Microscopy / Mechanical Radiography	New Products	Operations Manager	Printed Circuit Board	Process Engineering	Production Planning & Control	Quality Assurance	Research & Development Designer / Drafter	Special Products	Welding School	Welding	Welding Services	
Cuyahoga Community College - Associate of Applied Science																							
Electrical / Electronic Engineering Technology				●				●	●	●					●			●					
Electrical / Electronic Engineering Technology, Digital Communication Concentration				●				●	●	●					●			●					
Manufacturing Industrial Engineering Technology												●			●								
Operations Engineering Technology												●	●		●								
Smart Manufacturing - Mechatronics								●															
Operations Engineering Technology, Automated Manufacturing Concentration				●								●	●		●	●							
Automation Maintenance Engineering Technology				●	●																		
Mechanical Engineering Technology				●		●	●			●	●	●	●			●		●		●			



Entry Level Production - Onboarding



- Structured Onboarding Plans with Clear Goals
- Introduction to company culture, tools, and systems
- Mentorship programs to foster guidance & support

Week 1
Personal Effectiveness

Financial Literacy
Home vs. Work
Communication
Conflict Resolution
Time Management
Resilience

Week 2
Organization & Safety Compliance

Company Handbook
General Safety
General Quality
Lean / C.I.
Mfg Competencies
Universal Skills
Product Knowledge

Week 3
Division

Measurement Tools
Gauges
Meters
PLCs
Tags
MES
Physical Conditioning

Week 4
Department / OJT

Key Staff / Resources
Evacuation Routes
Schedules
Culture
Work Flow
Job Shadow



Community Colleges & Universities

- Earn & Learn – Technicians & Technologists
- Cooperative Education - Engineers
- Post Hire Training Program – 8 months



Manufacturing
2 Weeks
Rotation 1

Mfg Competencies
ISO9001 – Process
ISO14001 - EHS
ISO50001 - Energy

Workplace
Rotation 1

Quality Assurance
Production Experience
Lean / CI
EHS

Applied
Rotation 2

Consumable Engr
Application Engr
Manufacturing Engr
Maintenance

Technical
Rotation 3-5

Research & Dev
Power Electronics
Plant Engineering
Automation
Additive Mfg



Continuous Learning / Tooling U-SME Content Manufacturing Engineering Technology Certificate



- Introduction to CNC Machines
- Introduction to Electric Vehicle Charging
- Introduction to Circuits
- Wire Harness Components
- Printed Circuit Board Assemblies
- Introduction to Fluid Systems
- Introduction to Smart Manufacturing
- Introduction to the IOT
- Smart Manufacturing
- Basic Measurement
- In-Line Inspection Applications
- Troubleshooting
- Total Quality Management Overview
- Thermoplastics
- Principles of Injection Molding
- Introduction to Mechanical Systems
- Introduction to PLCs
- Intro to Supply Chain Management
- Introduction to Robotics
- Introduction to Collaborative Robots
- Statistics
- Soldering PCBs
- Press Basics
- Essentials of Leadership
- Basics of Manufacturing Costs
- Careers in Manufacturing

Attracting, Training, Retaining



- Effective Collaboration with Educators : Organizational Mapping
 - Competency Model for Curriculum Assessment : Knowledge, Skills, Abilities
 - Map Programs to Positions
- Strategic combination of onboarding & upskilling opportunities
 - People, Processes, Product
- Mentorship and Culture are equally important
- Continuous Learning
- Leverage Strengths : Consider a “Draft Day” format for initial placement





f sme
fusion

THE MANUFACTURING WORKFORCE EVENT



Geoff Lipnevicius

The Lincoln Electric Company

Geoff_Lipnevicius@lincolnelectric.com



Forwardskilling

The shared economy approach to
unlocking professional growth

Thomas Deslongchamps

Director of Training & Continuous Improvement
Pindel Global Precision
New Berlin, WI




CONTEXT: **THE MANUFACTURING LEGACY OF WISCONSIN**

- Wisconsin has a robust manufacturing ecosystem dating back to the late 1800s
- “Machine shop to the world”
- Manufacturing remains vital to Wisconsin's economy, despite decades of decline
 - Offshoring
 - Stigma around trades
 - Government incentives prioritizing four-year universities



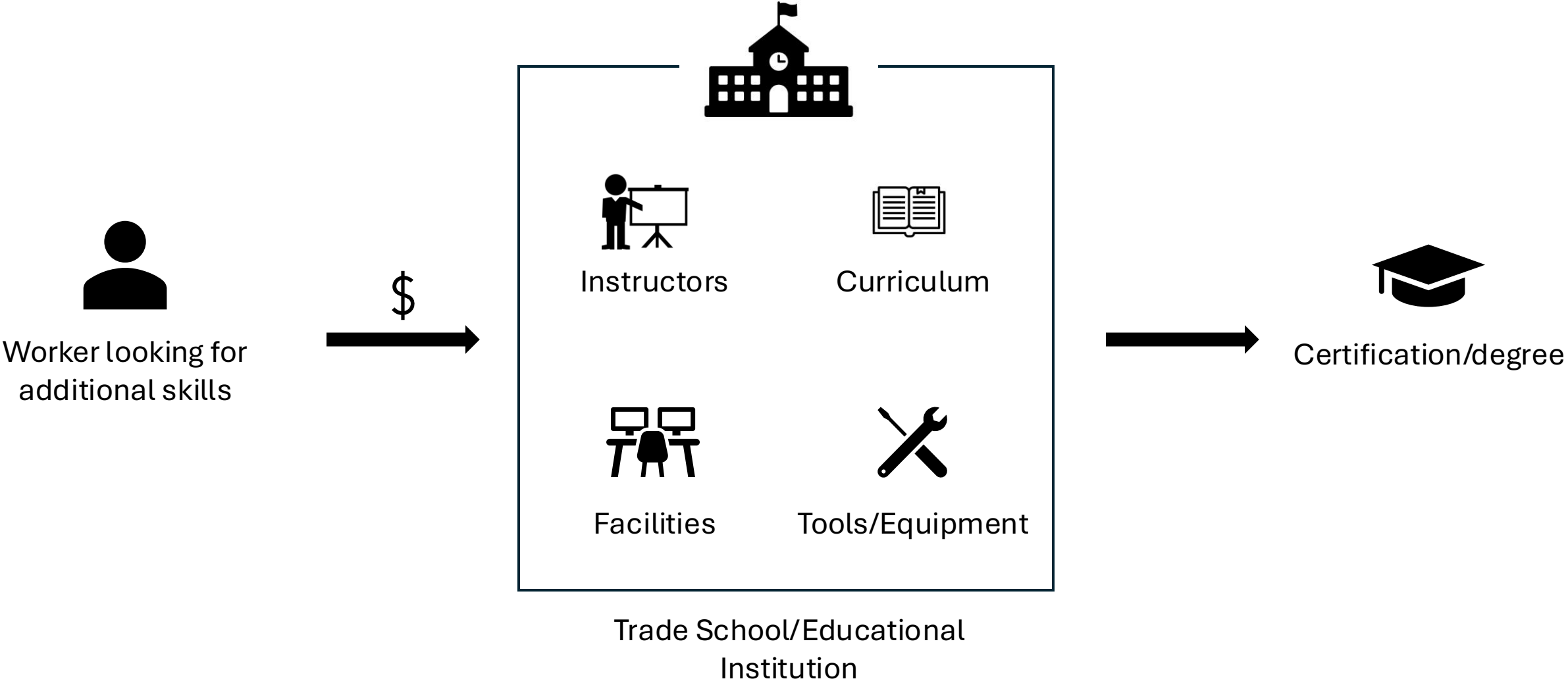


The pendulum is swinging...



We need to keep up
with the demand for
skilled labor

Legacy Education Model - Trades



Common misconception: education from the first 25 years of someone's life will last a whole career



f^{sme}
fusion

The Reality



TECHNOLOGY IS CHANGING
RAPIDLY



CAREERS LAST LONGER



EMPLOYERS AND EMPLOYEES
NEED FLEXIBILITY AND
ADAPTABILITY

What if...



What is Forwardskilling?



Developed by Pindel's CEO, Bill Berrien

- Princeton and HBS graduate
- Former Navy SEAL
- 2019 Presidential Leadership Scholar

Uber

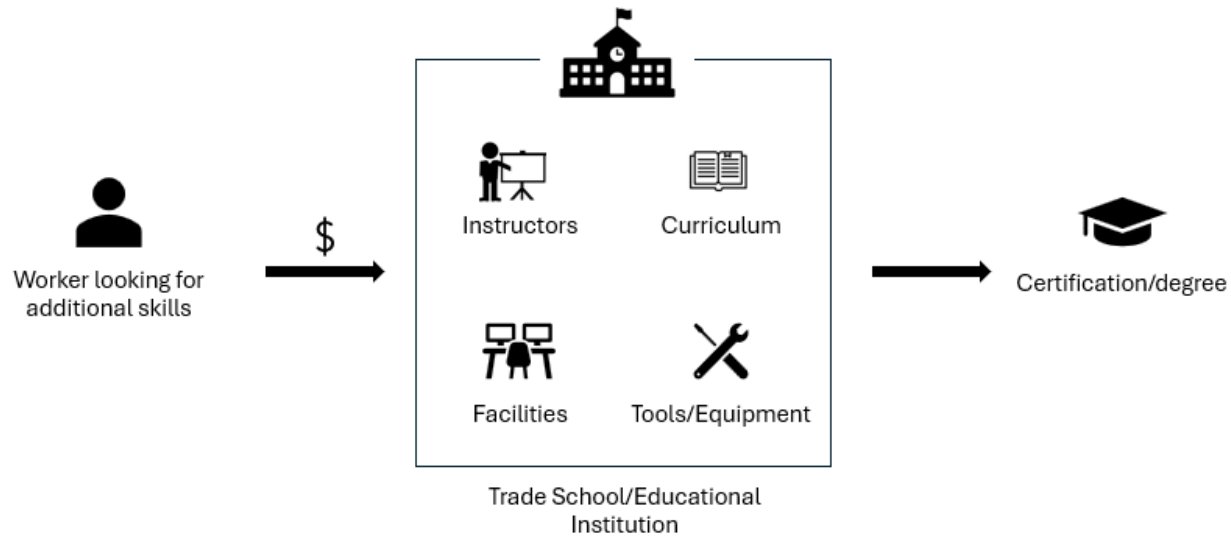
Shared economy model

- Leverage captive resources
- Enable more parties to participate in the market

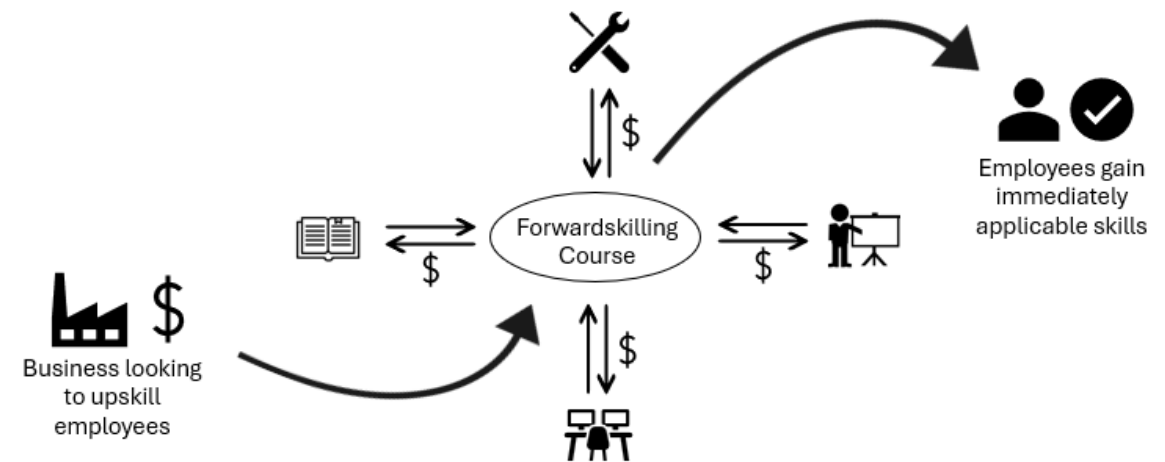
Clearinghouse

- Provide exposure for training opportunities

Legacy Education vs. Forwardskilling



- Legacy institutions own all educational resources
- Students pay for their own education
- Classes are during traditional school hours
- Full-time students take all courses, then apply them after graduation



- Course resources come from dispersed, unused assets
- Companies pay for employees' education
- Class times are flexible—whatever participants need
- Employees learn what they need, and simultaneously apply new skills at work



Results

- Create value, capture value
- Employee satisfaction
- Employee retention
- Resilient workforce
- All parties benefit
 - Employees
 - Pindel
 - Organizations with underutilized resources





Establish
Clearinghouse



Address Increased
Demand from
Employers and
Employees



Partnerships with
Legacy Institutions



Refine model

What's next?



Let's talk!

Linked 





f sme
fusion

THE MANUFACTURING WORKFORCE EVENT

**Closing the Skills Gap in Machining
Making Machining Attractive
with a Digital Approach**

Agenda



Cummins Overview

Powering a More Prosperous World



Traditional Approach

Mentoring & Hands on Experience



Innovative Solutions

Attracting, Accelerating and Retaining



Investing in our People

Striving for Right First Time



Powering a more prosperous world

34.1
billion dollars
in revenue
(U.S. dollars - 2023)

4
billion dollars in
operating cash flow
(U.S. dollars - 2023)

14
consecutive years
increasing dividends
to shareholders

190 Countries and territories*

75,500 Global employees

106 Years of industry leadership

19,000 Cummins certified dealer locations

\$1.5B Invested in research and technology in 2023

141 Manufacturing sites around the globe

** Approximation of countries and territories with Cummins service
As published in the 2023 10K found on cummins.com.*

Traditional Approach

“How do we make the critical industry trade of machining more attractive for top talent, accelerate their training and retain high performers?”



Apprentice Program Stats

Program Length	4 Years
Hours Required	8000 hrs
Company Cost	\$450k per person
Avg Tenure after Cert	3 ½ Years

The Manufacturing Institute in 2024 showed that 1.9 million manufacturing jobs could go unfilled over the next 10 years if talent challenges are not addressed.

Innovative Solutions



The Soft(ware) Side of Automation

Automation is a potential remedy to several woes, not the least of which is the looming skills gap

“I think you have today’s next-generation workforce coming in, and their expectation of how software and technology in general should work is just completely different,”

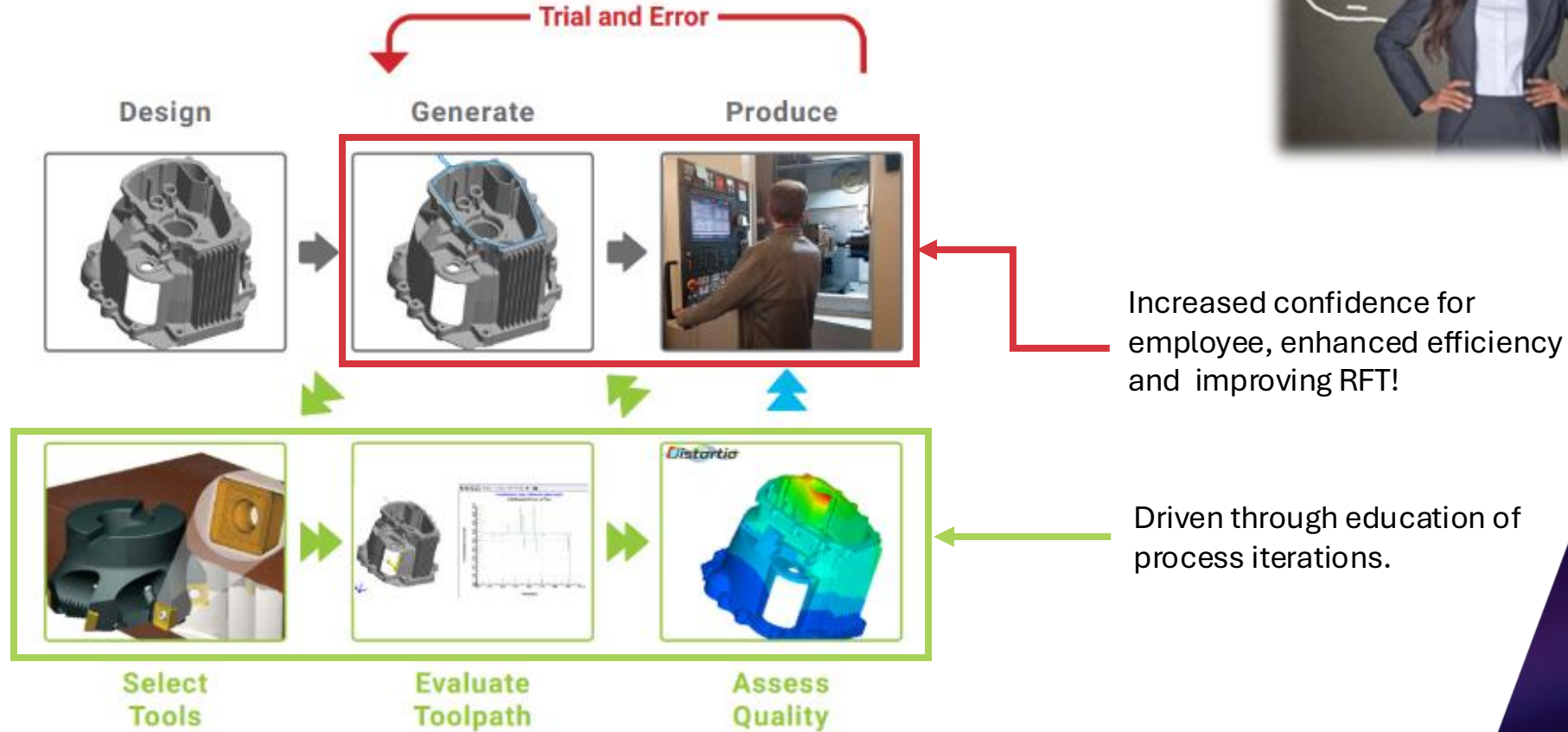


f^{sme}
fusion



Innovative Solutions

“Confident employees are successful employees”



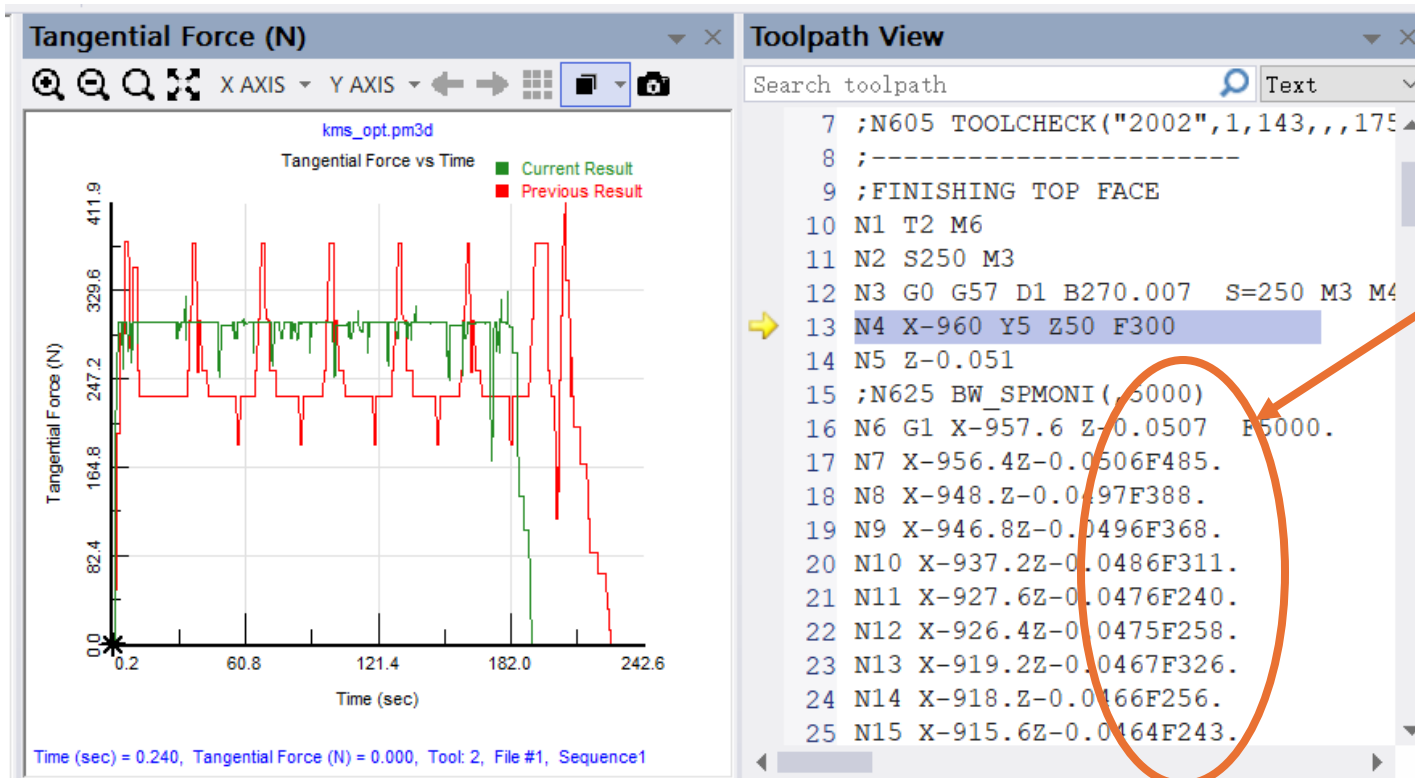
Investing in our people, at the time reducing cost to manufacturing!



f^{sme}
fusion

Innovative Solutions

The Machining Category has implemented material-based simulation software consisting of a learning algorithm, developed by Third Wave Systems. This technology was launched in 2024 to aid our early career, mid career and most experienced talent.



Outputs

- Variable Feed Rate
- Stable Force Signature
- Part Distortion Isolation

Inputs

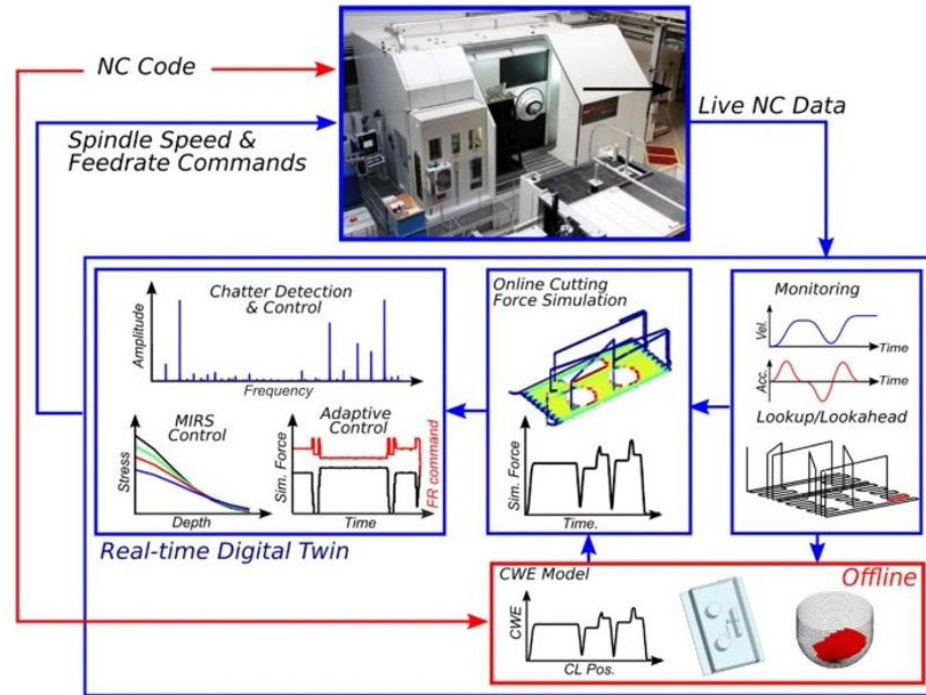
- Material Type
- Material Geometry
- Cutting Tool
- Machine Program



Innovative Solutions

Another advantage of a digital thread

Fig.1

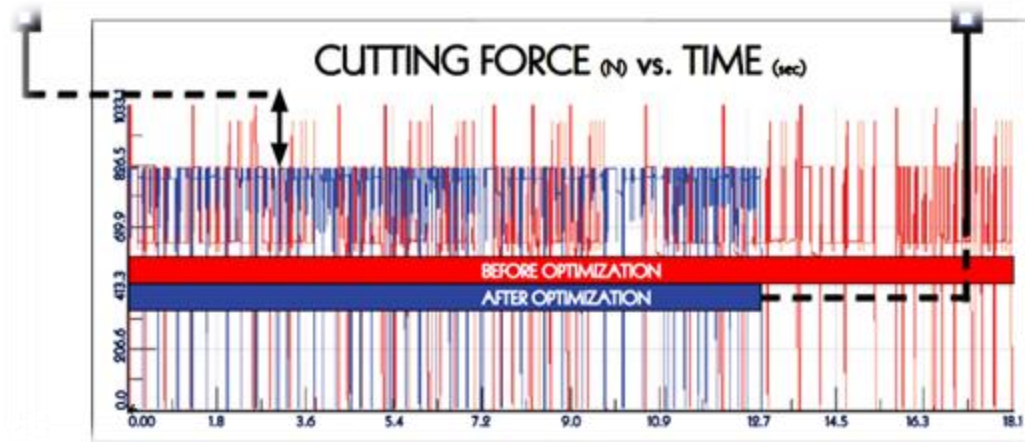
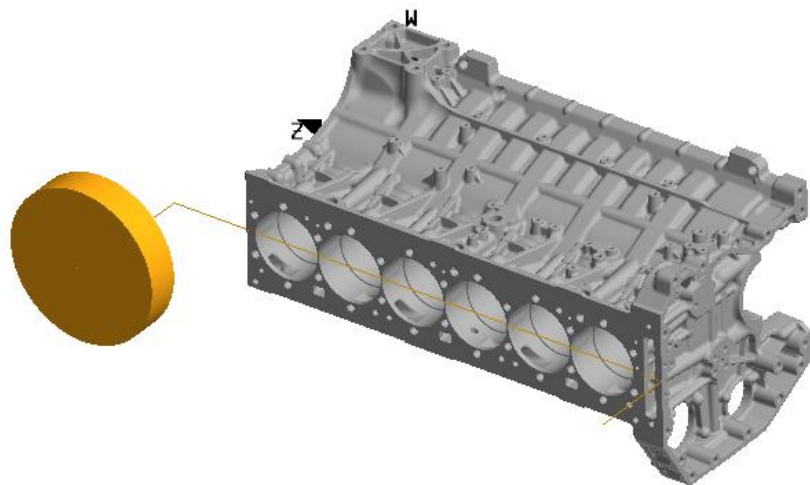


- Increase Right First Time
- Enable Confidence in Process Expectations
- Reduce Tooling Cost
- Cycle Time Optimization
- CIP Applications – Troubleshooting
- Decrease Defect Per Unit
- Faster to Production
- Machine Component Protection
- Training Aid



Innovative Solutions

- Accelerate learning
- Practical experience without machine
- Prevent costly machine crashes
- Increasing RFT
- Greater ROI
- Digital language vs legacy
- Alignment with academic community.



Investing in our People



Goals

- Alignment with top tier academic institutions.
- Provide the required next generation of tools for our engineers and technicians.
- Ensure the highest level of competency for our machining category.
- Attract top talent into Cummins to ensure delivery to our customers.
- Provide a rewarding environment where the individual has the confidence they need to succeed.



f^{sme}
fusion



Contact Information

Derek Anti CMfgE
Global Director of Manufacturing Engineering
Machining Category
Cummins Inc
500 Central Ave
Columbus IN 47202
Derek.Anti@Cummins.com



April 8, 11:00 AM – 12:00 PM

Recruiting Engineering Graduates, Onboarding, and Upskilling



Dan Sloan, moderator

Director of Industry & Workforce Partnerships

SME



Geoff Lipnevicious

Senior Manager, Organizational Effectiveness

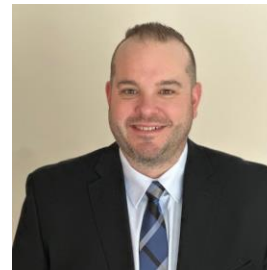
The Lincoln Electric Company



Thomas Deslongchamps

Director of Training & Continuous Improvement

Pindel Global Precision



Derek Anti

Global Director of Manufacturing Engineering

Machining Category

Cummins



f sme 
fusion

THE MANUFACTURING WORKFORCE EVENT

DETROIT, MI

April 8-10, 2025