

AI, Productivity, and Differentiation: Implications for Small Manufacturers

Exploring the transformative potential of AI in small-scale manufacturing.

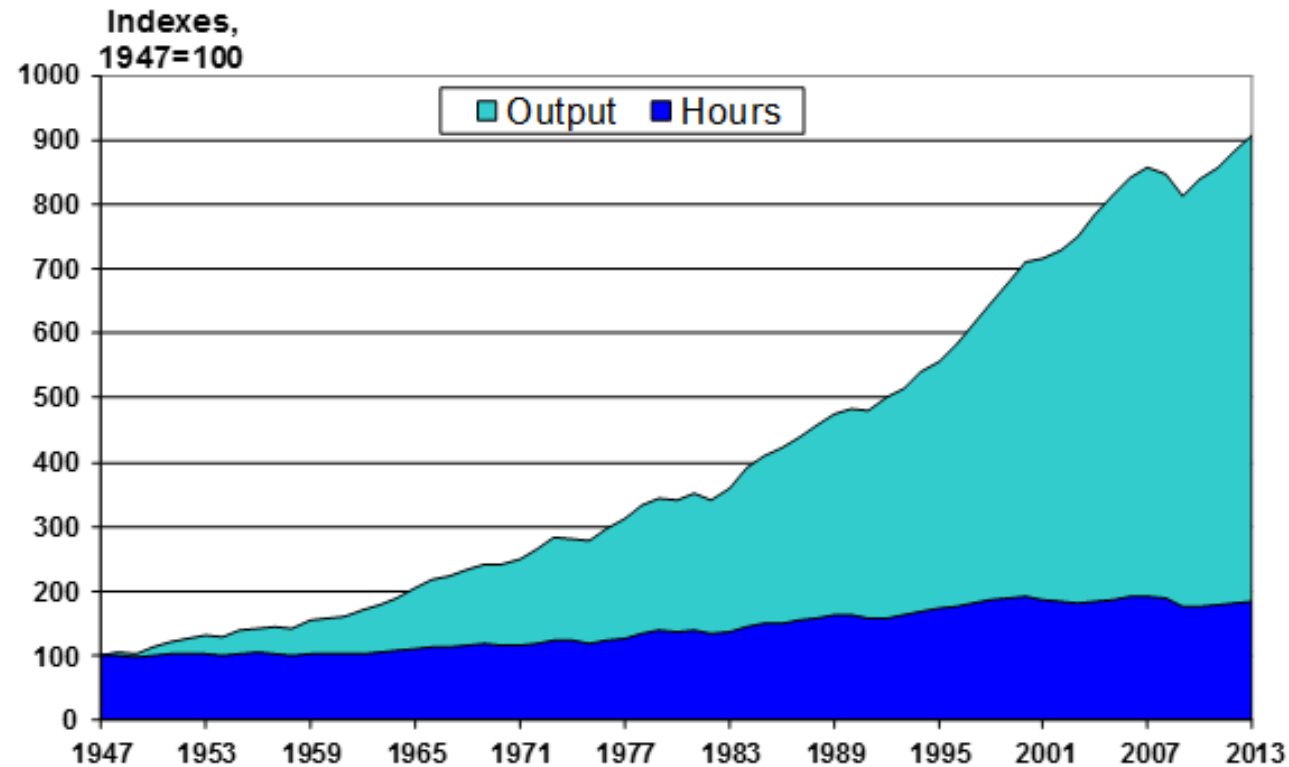
Presented to the Quad Cities Manufacturing Conference

Patrick Pollock & *MS Copilot*

9-5-2024

Productivity's Economic Impact

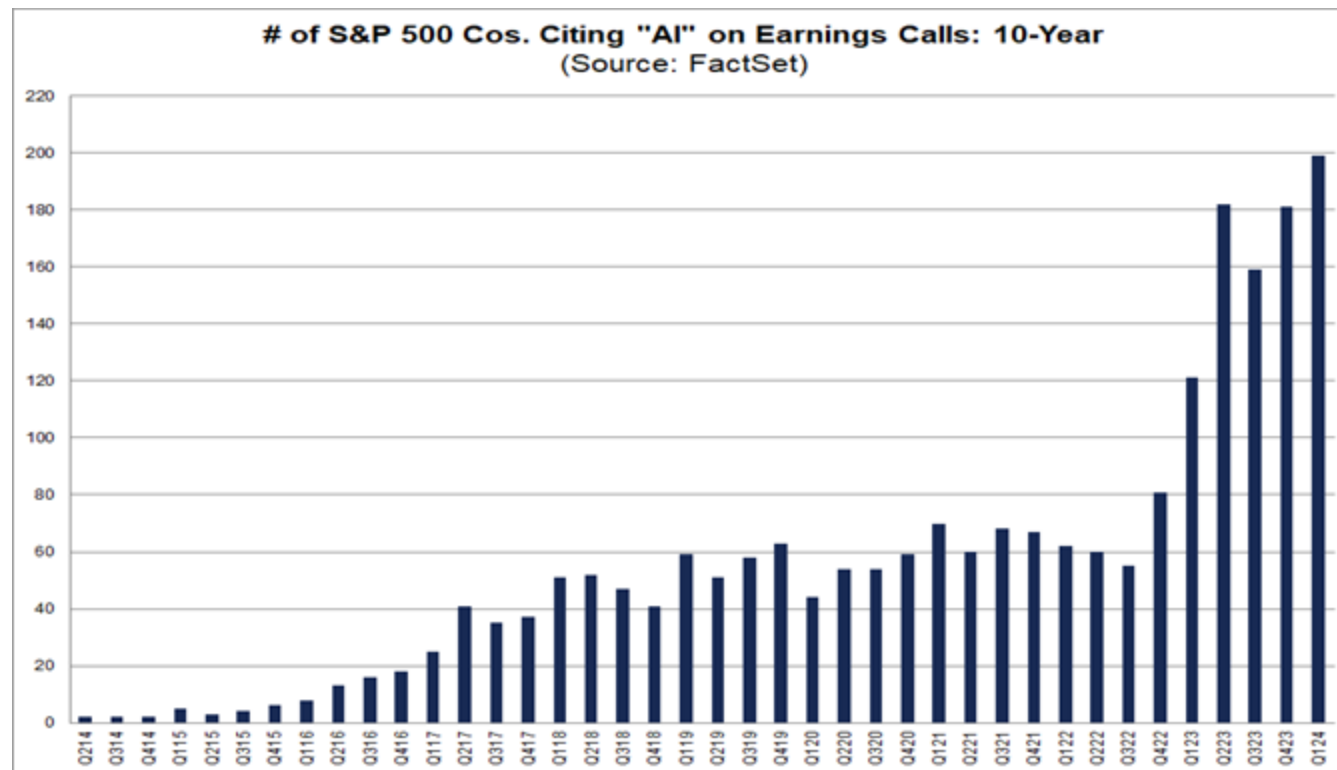
On a country scale, productivity can mean the difference between good and not-so-good standards of living.*



*McKinsey & Company: "What is Productivity?"

Chart: Bureau of Labor Statistics

What's all the hype about AI?



How does AI = More Productivity?

Why should we care about AI

How can American workers compete globally?

Let's look at welders to understand the potential challenge:



- ✓ The US has a welder deficit of ~ 300K*
- ✓ Two-thirds of the US welders are over 45
- ✓ Younger workers not pursuing welding
- ✓ Welding is physically challenging

“In 2022, nearly one-third of the manufacturing workforce was over 55 years of age.”

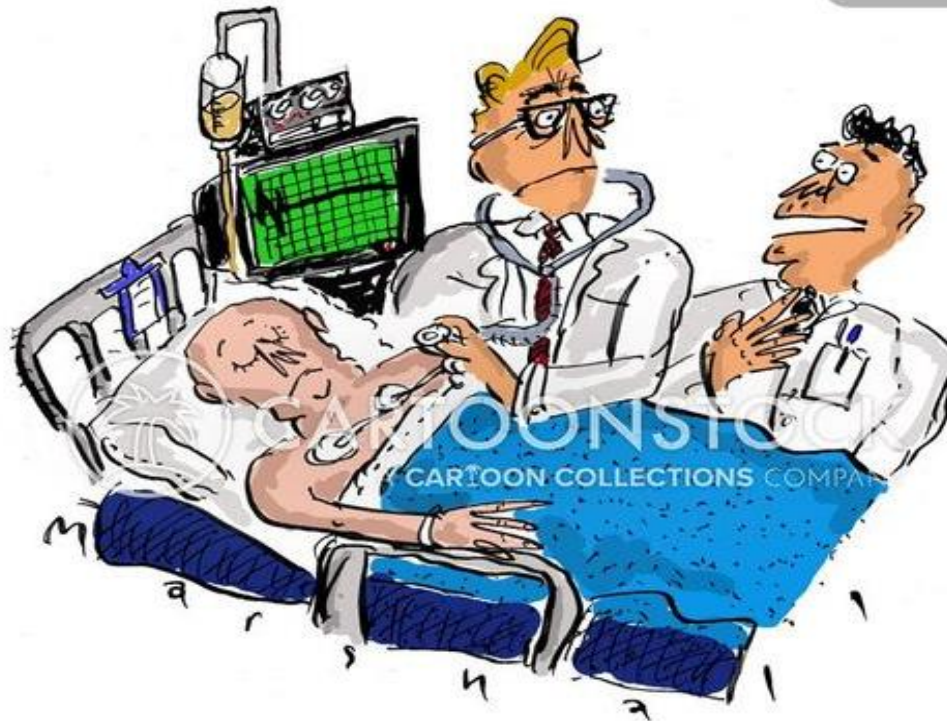
(Deloitte Insights, “Manufacturing Industry Outlook 2024,)

*American Welding Society

Manufacturing's Critical Condition!

How can we save the patient?

CS420298



*'Have you tried switching him off and
switching him back on again.'*

AI, Manufacturing's Reboot?

The Rise of AI in Manufacturing

Historical Context:

- Robotic process automation
- Machine learning
- Specialized language models

Current Trends:

- Generative Pretrained Transformers
- Chat GPT (Copilot other open AI models)
- Gemini
- Others

Can AI really make a difference?

Can AI enhance productivity? When used correctly you can,

- Maximize human effectiveness with AI-driven interaction
 - Allow AI to learn
 - Get better information
 - Produce accurate results faster
- Streamlining customer interaction and processes with AI-enabled tools
 - Machine learning and large language models can learn to “lead the witness,” in a good way

We will cover this in detail in the “Dave” case study that follows...

Case Study - Dave

Digital Application Virtual Engineer

The challenge, quote hit rate

Delayed responses and manual quote processes lead to

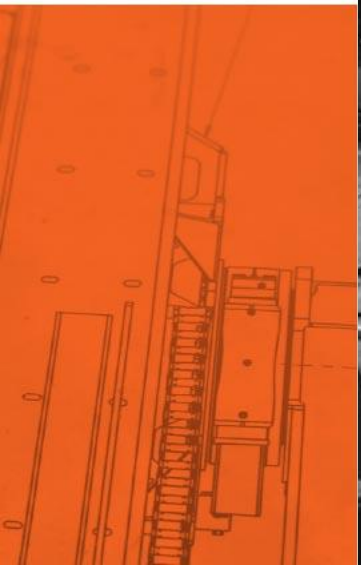
- Missed sales
- Excessive customer back-and-forth.

Limited Sales Resources

- Do we hire new Sales Team Members?
- Where, who, and how many?

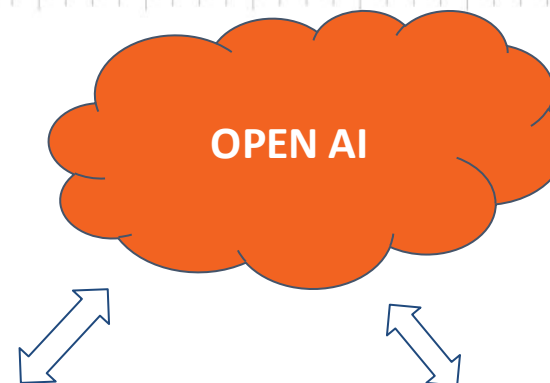
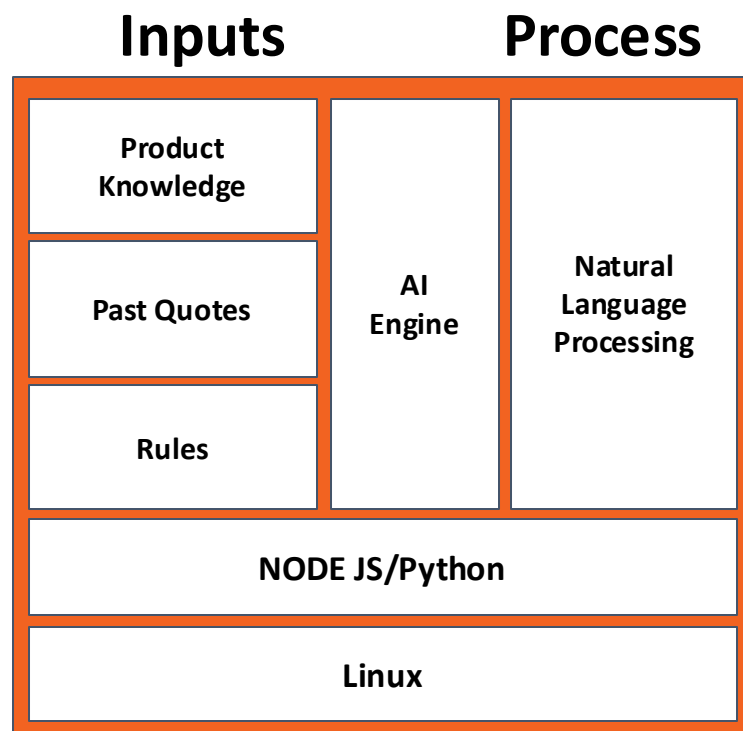
Inconsistent communications lead to

- Sub-optimized quotes
- Lack of actionable intelligence



Case Study - Dave

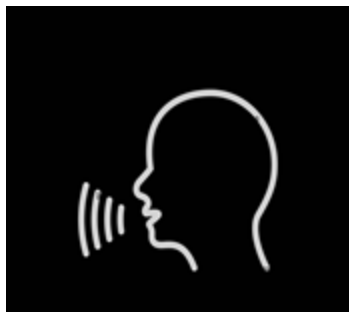
The Solution



DAVE...

Understanding Customer Needs
Personalized Experience
Customer Coaxing
Automated Proposal Creation
Sales Team Collaboration
Analytics & Insights

Case Study - Dave



**Digital Application
Virtual Engineer**

Productivity!



Sales Efficiency



Analytics & Insights



Personalized Experience

Can AI improve my products?

The slide features a decorative background with a series of small, light-gray plus signs arranged in a horizontal line across the top. On the left side, there are two vertical rectangular panels. The top panel shows a close-up of bright orange and yellow sparks or molten metal. The bottom panel shows a technical line drawing of a mechanical assembly, possibly a conveyor system or a large machine, rendered in a light orange color.

Differentiate your products by leveraging AI, *customize existing products to make them...*

- *Better* - AI can improve human-machine interaction
- *Faster* - AI can increase throughput
- *Safer* – AI can improve safety

We will cover this in detail in the “Viki” case study that follows...

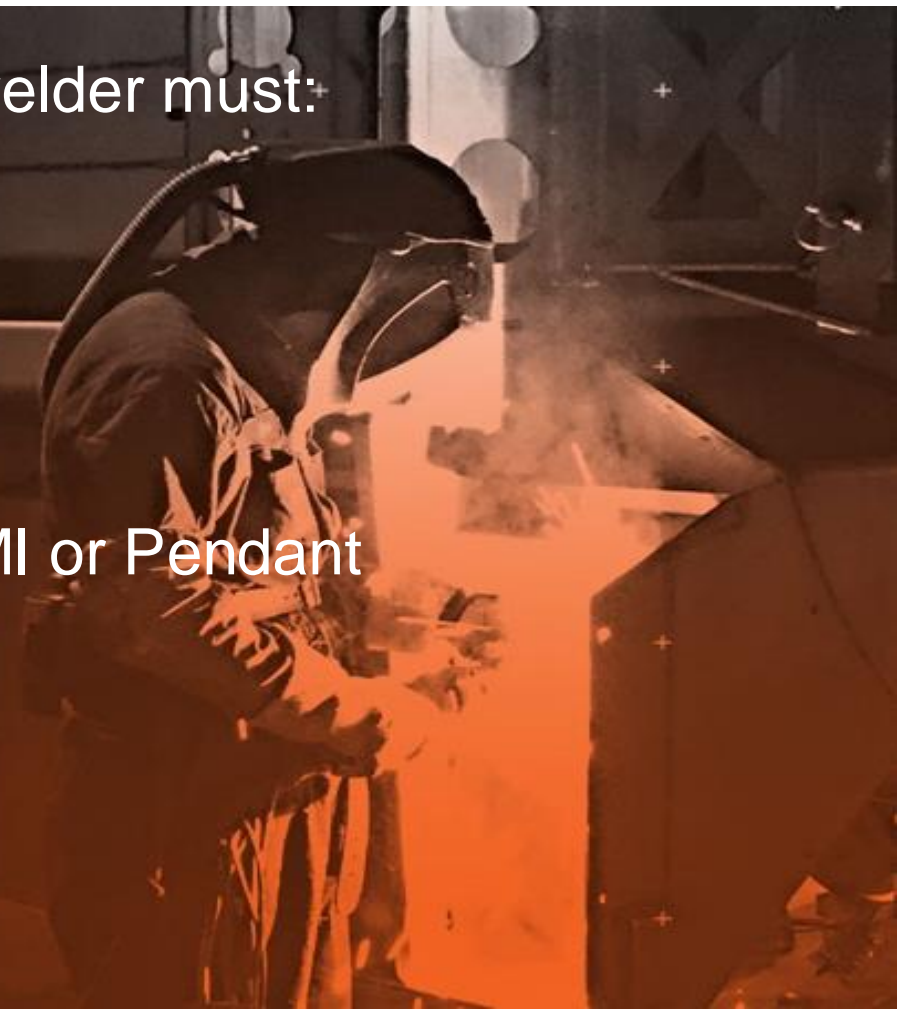
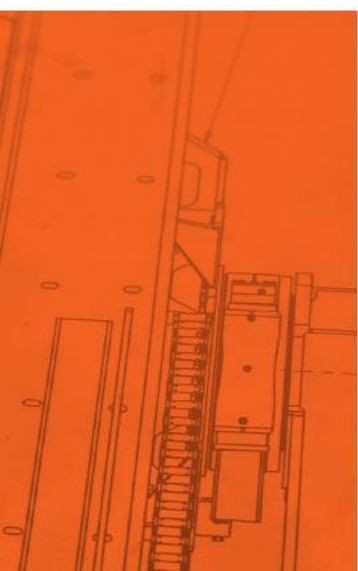
Case Study - Viki

Voice Initiated Kinetic Intelligence

The Challenge; Low throughput

To reposition the part for processing the welder must:

1. Stop work
2. Lift their weld helmet
3. Put the torch down
4. Walk to the HMI, or find pendant
5. Remove gloves
6. Initiate the motion command on HMI or Pendant
7. Put gloves back on
8. Walk back to part
9. Pick up torch
10. Lower helmet
11. Start work



Case Study - Viki

The Solution

Viki-OS brings unparalleled speed and intelligence, allowing you to manufacture at the speed of thought.

Key Features:

- **Voice-Enabled Intelligence:** Seamlessly interact with our positioner using natural voice commands.
- **Efficiency Redefined:** Experience improved performance and productivity with less down-time.
- **User-Friendly Interface:** Intuitive commands for effortless navigation and use.

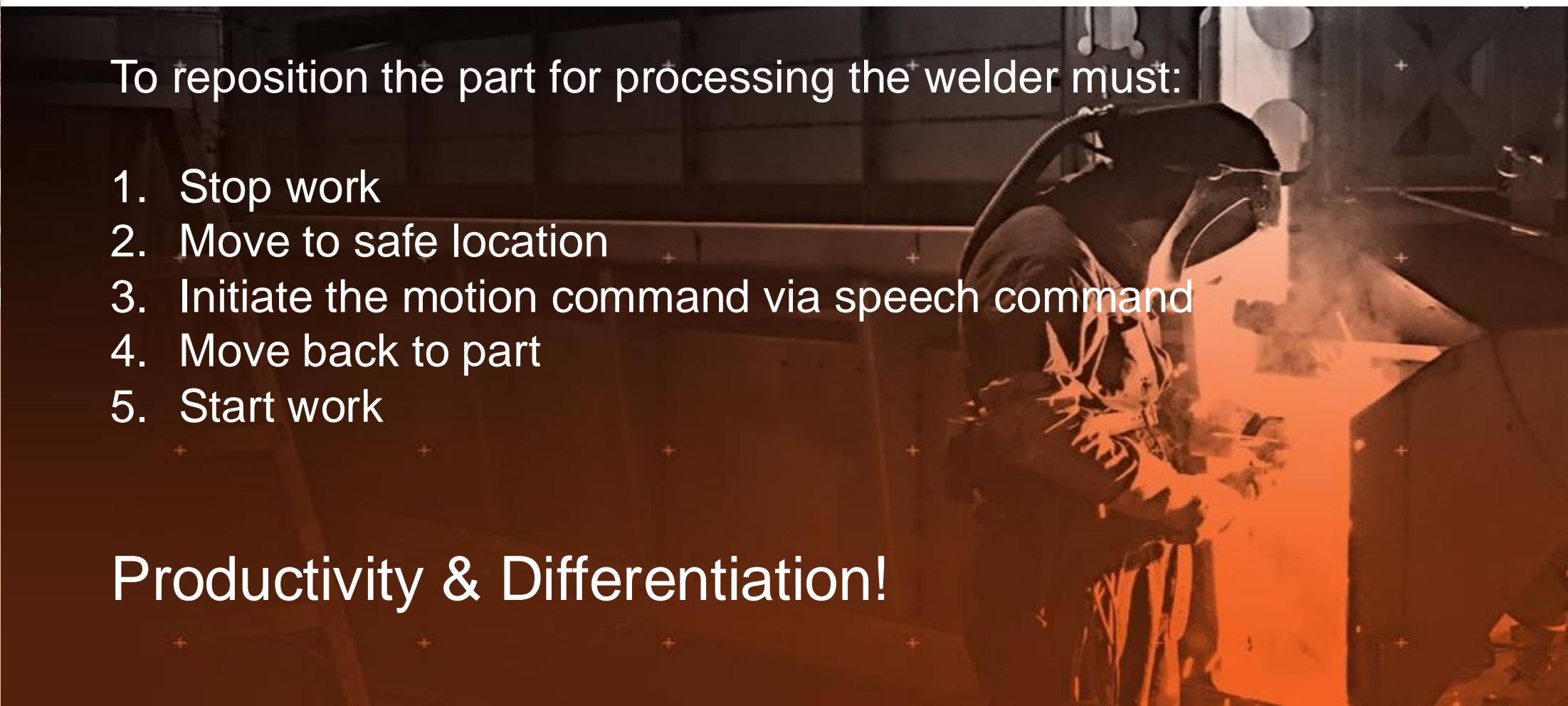
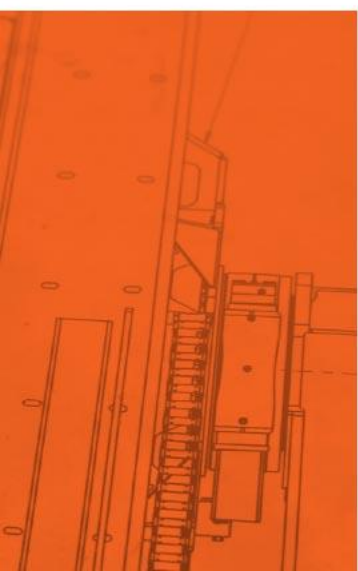
Case Study - Viki

Improved throughput & less operator fatigue

To reposition the part for processing the welder must:

1. Stop work
2. Move to safe location
3. Initiate the motion command via speech command
4. Move back to part
5. Start work

Productivity & Differentiation!

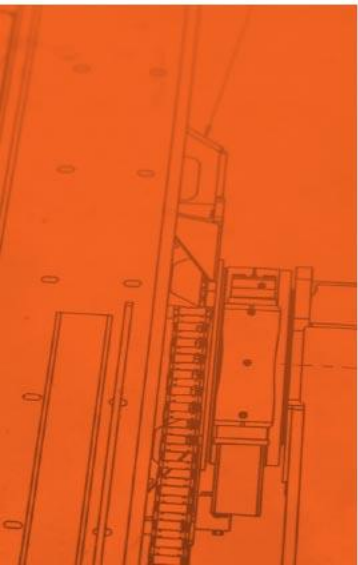


Challenges and Considerations



Barriers to Adoption:

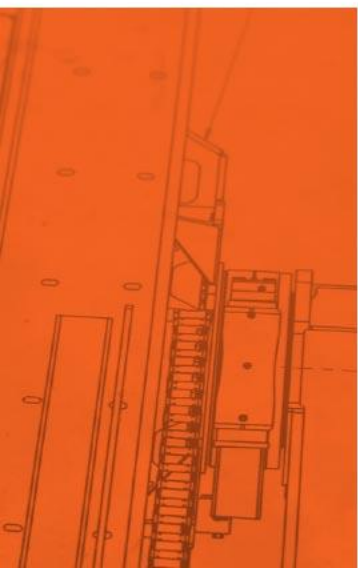
- Training, Employees need to understand intent
- How will the employees embrace AI technology?
- Is my product and process fit for AI?
- Can my workforce take advantage of the technology?



Legal and Ethical Issues:

- Human dislocation
- Data privacy
- Security
- Compliance

Future AI Opportunities



- Connected machines capture process data
 - Data can be used for predictive maintenance
 - Improved up-time
-
- Process intelligence
 - Improved quality
 - In-process quality verification
 - Enhanced ergonomics
-
- AI enhanced human machine interface
 - AI assisted production optimization
 - Collaborative process intelligence

Q&A

Remember, I'm not an AI expert, please take it easy on me 😊