

ChatGPT for Front-line Workers in Manufacturing

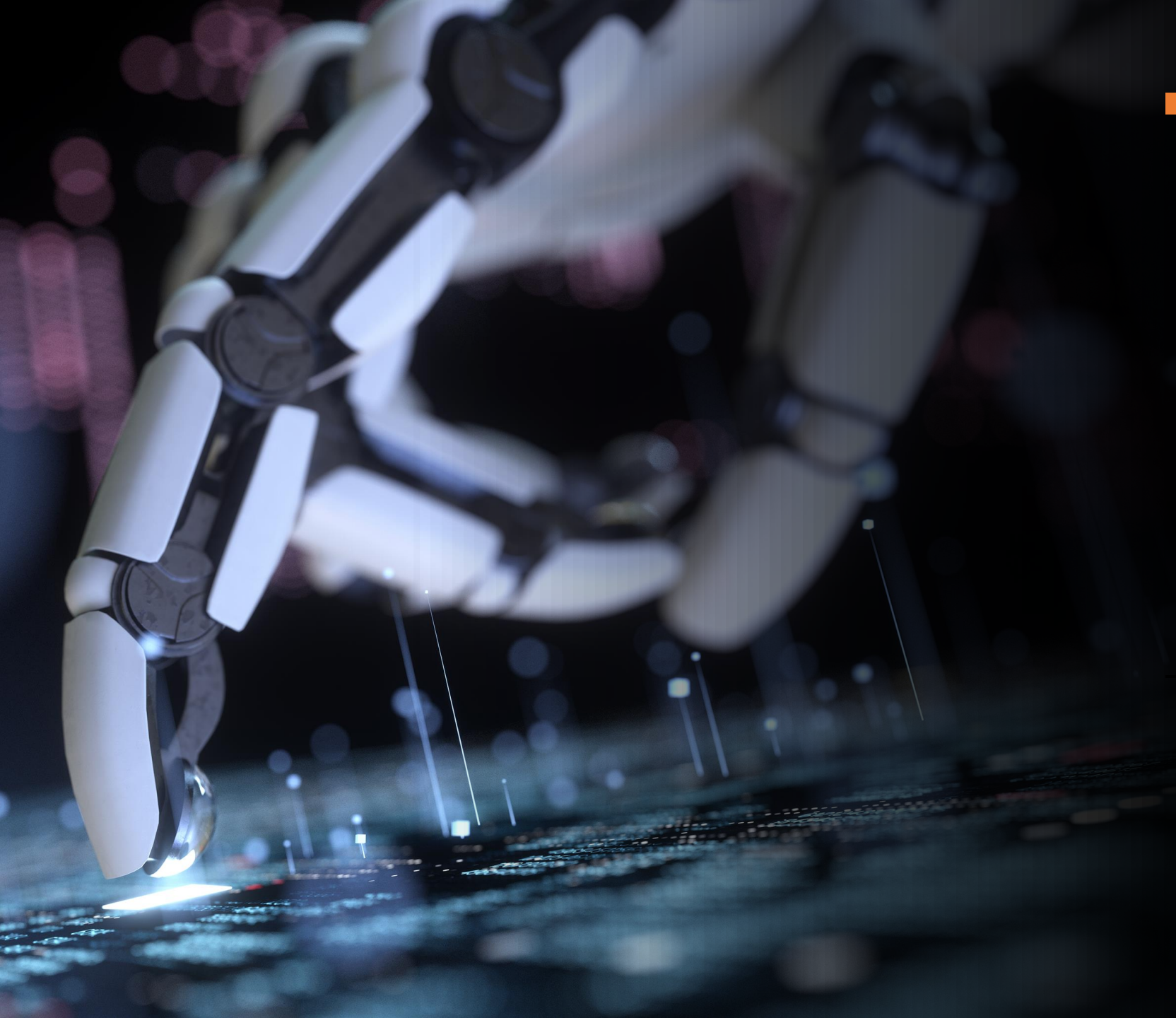
Leveraging Artificial Intelligence for Real-time Operational Guidance

Adrienne Kroll, Management Systems & Quality



Agenda

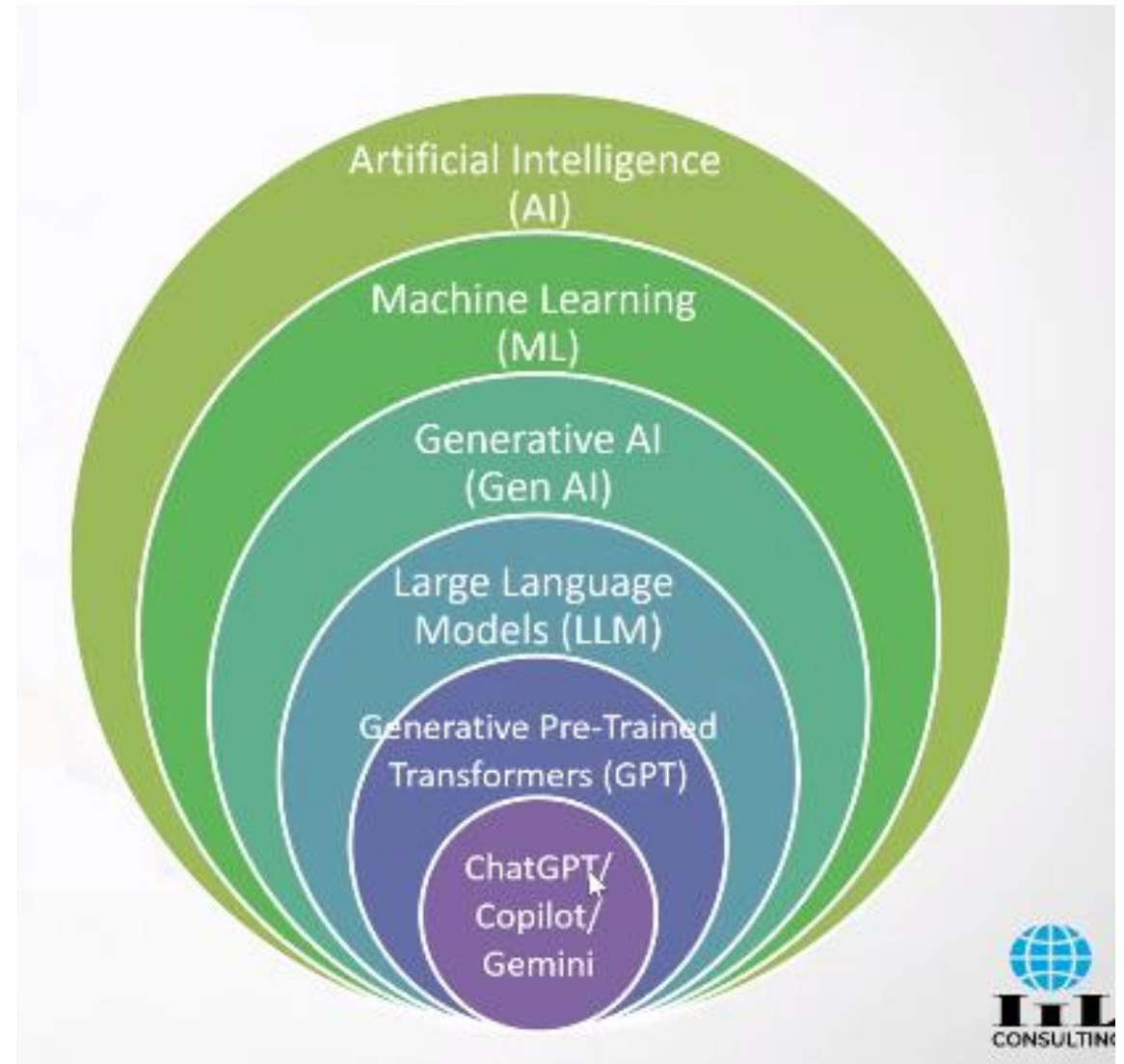
- Introduction to ChatGPT
- Manufacturing Landscape & Trends
- ChatGPT in Our Daily Work
- Optimizing Prompt Results
- Getting Started with ChatGPT
- Ongoing Considerations



Welcome to
the Future of
Manufacturing!

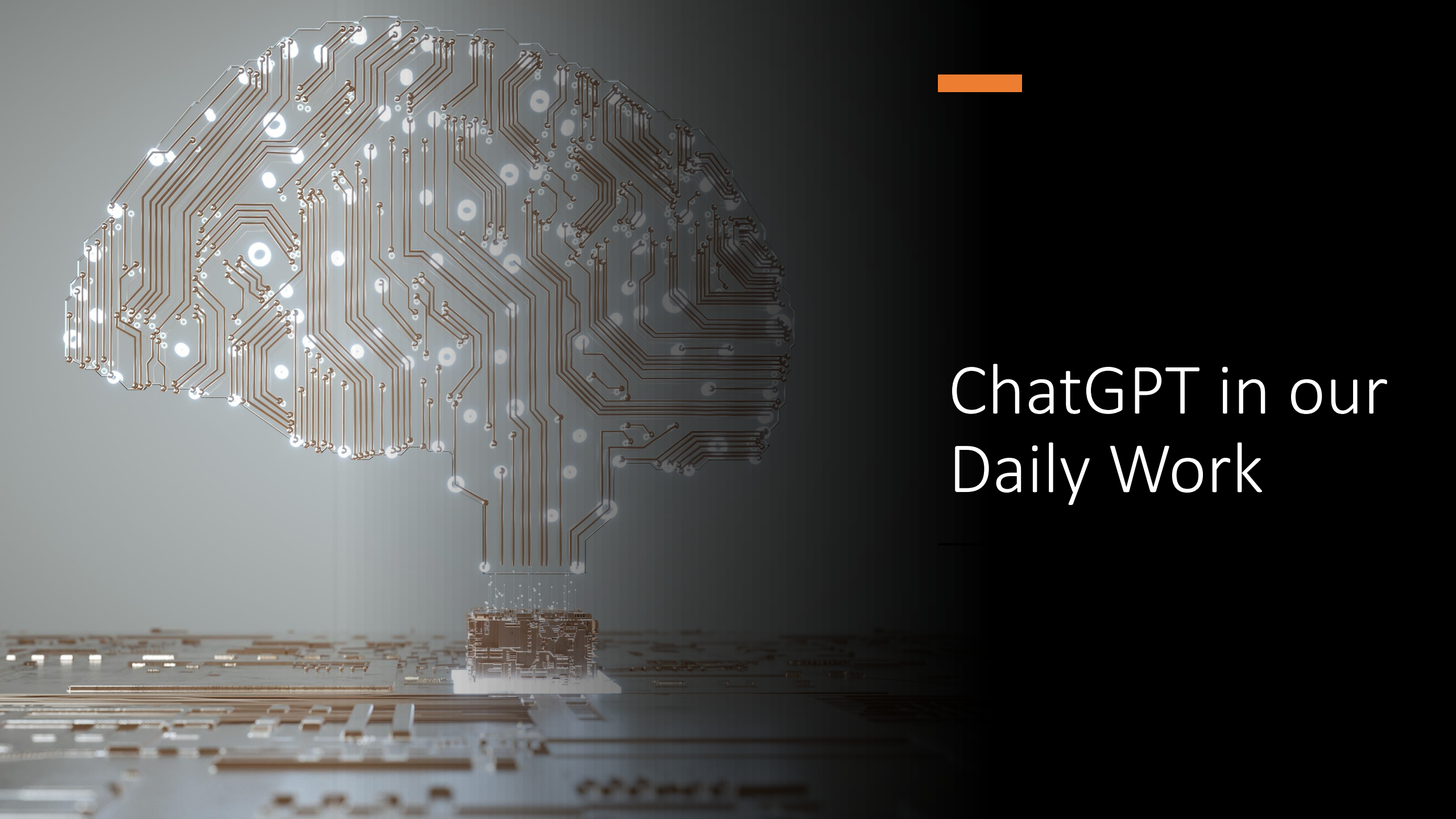
Artificial Intelligence vs. ChatGPT

- Artificial Intelligence, is a broad field of computer science focused on creating systems capable of performing tasks that typically require human intelligence. These tasks include problem-solving, understanding natural language, recognizing patterns, and learning from experience.
- ChatGPT, on the other hand, is a specific application of AI (LLM) developed by OpenAI, backed by Microsoft, and released in November 2022. Focuses on generating human-like text based on the input it receives.



The importance of AI in manufacturing spans from enhancing efficiency & productivity to enabling more adaptable manufacturing processes. Examples of current AI trends in manufacturing includes:

Productivity and Efficiency Gains	A report by McKinsey Global Institute suggested that AI could potentially deliver an additional economic output of around \$13 trillion by 2030, boosting global GDP by about 1.2 percent annually .
Predictive Maintenance	According to a study by Deloitte, predictive maintenance can reduce the time required to plan maintenance by 20-50%, increase equipment uptime and availability by 10-20%, and reduce overall maintenance costs by 5-10% .
Quality Control	A report from Capgemini found that manufacturers implementing AI in their operations could increase their operational efficiency by up to 20% . AI systems, particularly those utilizing computer vision for quality inspection, have demonstrated the capability to reduce defect detection times by up to 90% and improve detection accuracy significantly.
Supply Chain Optimization	A survey by the Manufacturing Leadership Council highlighted that over 40% of manufacturers are using AI-based solutions for supply chain forecasting and planning , experiencing improvements in supply chain efficiency and responsiveness.
Workforce Impact	Despite fears of job displacement, the World Economic Forum's "Future of Jobs Report 2020" suggests that by 2025, automation and AI will create 97 million new jobs across various sectors, including manufacturing.



ChatGPT in our Daily Work

Front-line Worker in Manufacturing

An employee who is directly involved in the production of goods. These workers are typically on the manufacturing floor, operating machinery, assembling products, conducting quality checks, or performing maintenance. They are crucial to the manufacturing process as they handle the physical creation and assembly of the products that the company sells.



POLL

What do you think is most important to Front-line Workers in Manufacturing?



Communication



Quality



Knowledge & Change Management



Safety



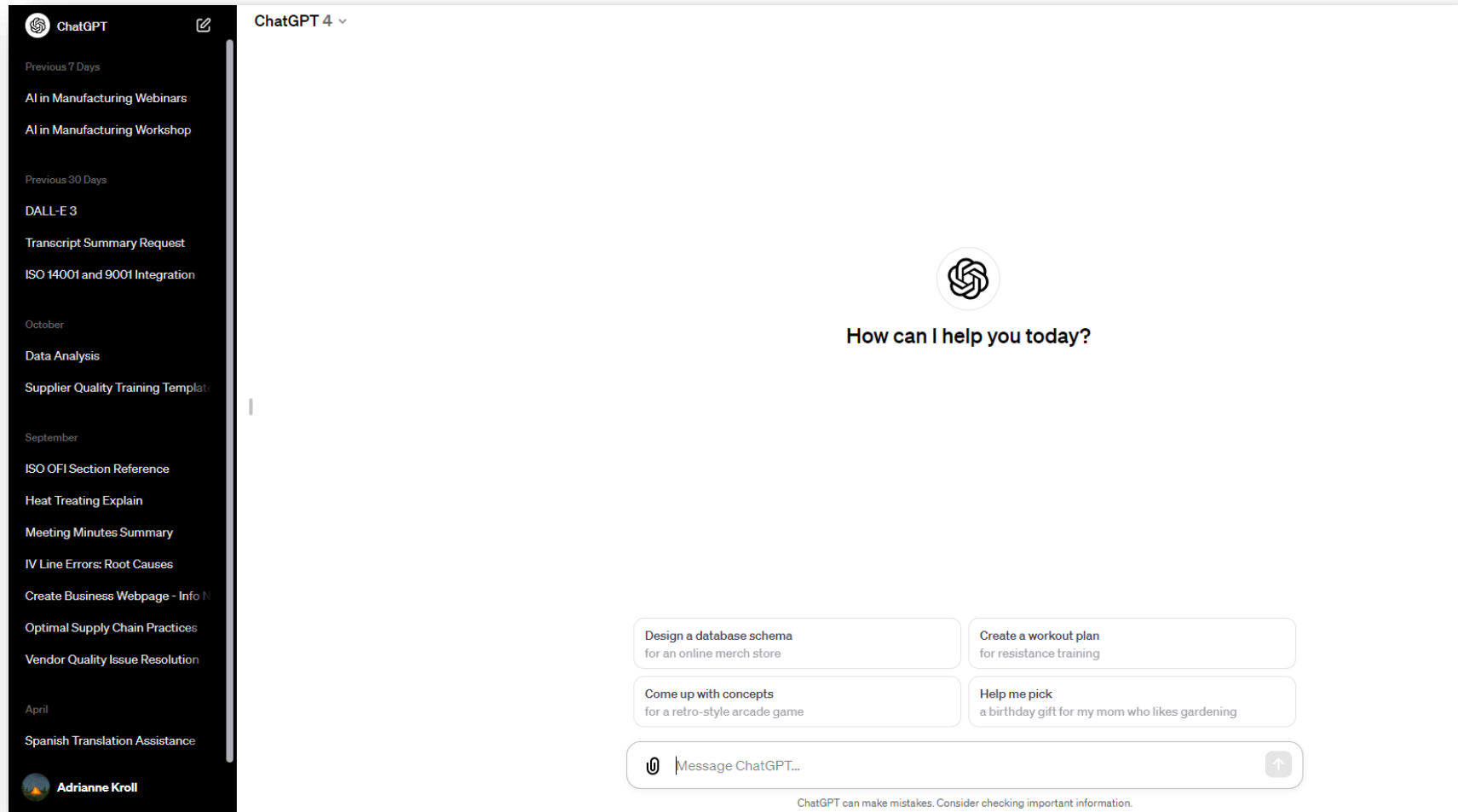
Continuous Improvement



All of the above

Accessing ChatGPT

Visit chat.openai.com and create an account.

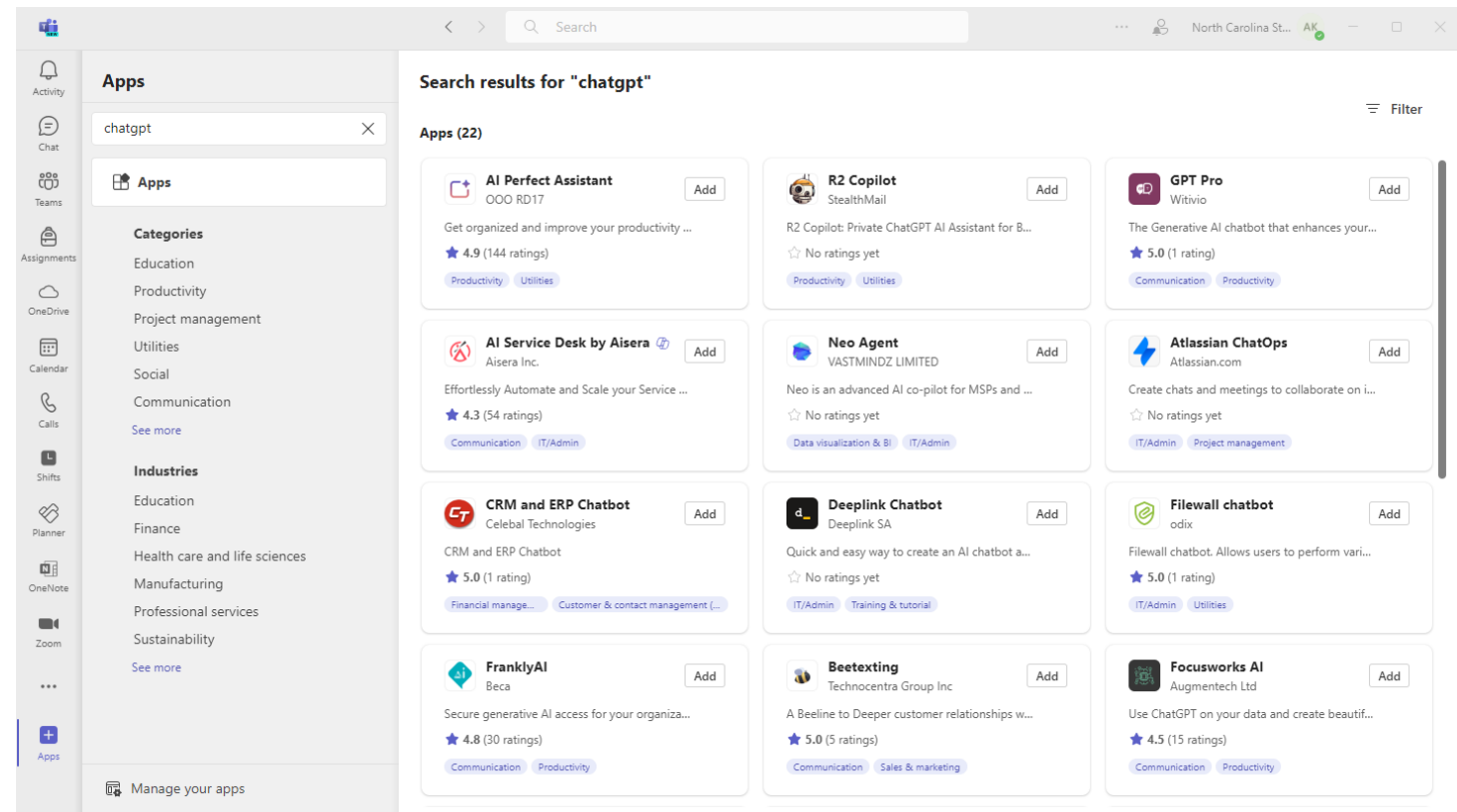


The screenshot displays the ChatGPT web interface. On the left is a dark sidebar with the ChatGPT logo and a list of previous conversations categorized by time periods: 'Previous 7 Days', 'Previous 30 Days', 'October', 'September', and 'April'. The main chat area is white and features the OpenAI logo at the top center, followed by the text 'How can I help you today?'. Below this are four suggested prompts in rounded rectangular boxes: 'Design a database schema for an online merch store', 'Create a workout plan for resistance training', 'Come up with concepts for a retro-style arcade game', and 'Help me pick a birthday gift for my mom who likes gardening'. At the bottom of the chat area is a text input field with a placeholder 'Message ChatGPT...' and a send button. A small disclaimer at the very bottom reads 'ChatGPT can make mistakes. Consider checking important information.'

Communication

Making Teamwork Better with ChatGPT

- Translates Languages
- Sends reminders and alerts
 - Integration with Slack, Microsoft Teams, Trello, Jira, custom systems
- Enhancing internal communication tools
 - Summarizes emails & meeting transcripts, helps with conflict resolution, helps with writing responses
- Feedback and suggestions
 - By acting as a feedback tool, ChatGPT can gather inputs from workers about workplace issues, improvement suggestions, or safety concerns. This feedback can be anonymized and analyzed to improve workplace practices and employee satisfaction.



Scenario

Addressing Employee Feedback

Background:

- Steve leads the effort at Tiger, Inc. to gather feedback on workplace issues & improvements.

Problem:

- Some employees have recently started to complain that no one is addressing the ideas they have submitted. Steve would like to organize the information by type of issue and develop an action plan for Management to use to start addressing the concerns.





Outcome & Benefits

Solution & Outcome:

- Management now has an actionable plan to begin addressing staff concerns.

Benefits:

- Increased employee morale
- Continuous improvement in the facility
- Manageable plan for Leadership

Quality

Keeping Quality Top-Notch

-
- **Analyzes data** – ChatGPT can look at production data and tell us if something is wrong. (*Diagrams & Data GPT*)
 - **Troubleshooting help** - ChatGPT can offer solutions based on what has worked before.
 - **Suggests improvements** – ChatGPT can propose better ways to do our tasks.
 - **Innovation ideas** - ChatGPT can help us think of new ways to use materials or streamline processes.



Scenario

Machine Operator Troubleshooting with AI Assistance

Background:

- Jackson is a machine operator at 'ModernTech Manufacturing,' a company that specializes in automotive components. He has been operating CNC (Computer Numerical Control) machines for several years. The company recently integrated ChatGPT as an AI assistant to help operators with real-time troubleshooting.

Problem:

- One morning, Jackson noticed that the CNC machine started producing parts with uneven finishes, which wasn't typical. He checked the machine settings, and everything seemed normal. Unsure of the next steps and with a production target to meet, he decided to seek assistance.



Outcome & Benefits

Solution & Outcome:

- The issue was resolved with much faster diagnosis using ChatGPT. Jackson saved valuable production time and prevented further production of defective parts. Jackson's Supervisor was able to create a training document to train others.

Benefits:

- Real-time troubleshooting assistant
- Reduction in downtime
- Helping ensure consistent product quality
- Instilled confidence in Machine Operator



Knowledge & Change Management

Knowledge Management with ChatGPT

- Training & Onboarding
 - Providing new employees with easy access to training materials, instructional content, and answers to frequently asked questions. Continuous learning.
- Documentation & Reporting
 - ChatGPT can assist in generating and maintaining documentation and reports.
 - Helping workers compile daily reports, log incidents, or create maintenance records, reducing the administrative burden and allowing them to focus more on their core work responsibilities.
 - Developing pictures for training material and SOPs.



Scenario

Helping Employees Find Information

Background:

- Cliff is a newly hired Quality Manager at ACME Corporation. He is not new to quality management but is new to quality management processes and procedures at ACME.

Problem:

- During a recent leadership meeting, there was some discussion and confusion about who is responsible for generating, assigning, and following up on corrective actions as well as how long departments have to respond to corrective actions. It was discovered that this information is not easy to locate or being communicated to staff.





Outcome & Benefits

Solution & Outcome:

- The SOP and process are now more readily available for employees to access and use.

Benefits:

- Reduction in confusion about process steps
- Better adherence to processes & procedures
- Helping ensure consistent standard work
- Instilled confidence in team members



Safety

Staying Safe with ChatGPT

- **Provides safety tips** – Get quick advice on how to handle hazardous materials.
- **Monitors safety conditions** – ChatGPT can alert us if it detects something dangerous in the workplace.
- **Provides safety alerts** - ChatGPT can be programmed to send real-time safety alerts or reminders about wearing protective equipment, following safety protocols, or preparing for inspections. This proactive communication helps maintain high safety standards.

Scenario

Keeping Safety First

Background:

- Tina is the Safety Manager at Steel Toes, LLC. The company is expanding and taking on additional people and equipment resources.

Problem:

- The company is growing and needs to acquire additional forklifts and hire additional forklift drivers. This prompts Tina to think about whether the business is up to date on the most recent guidelines for operating forklifts in the facility.



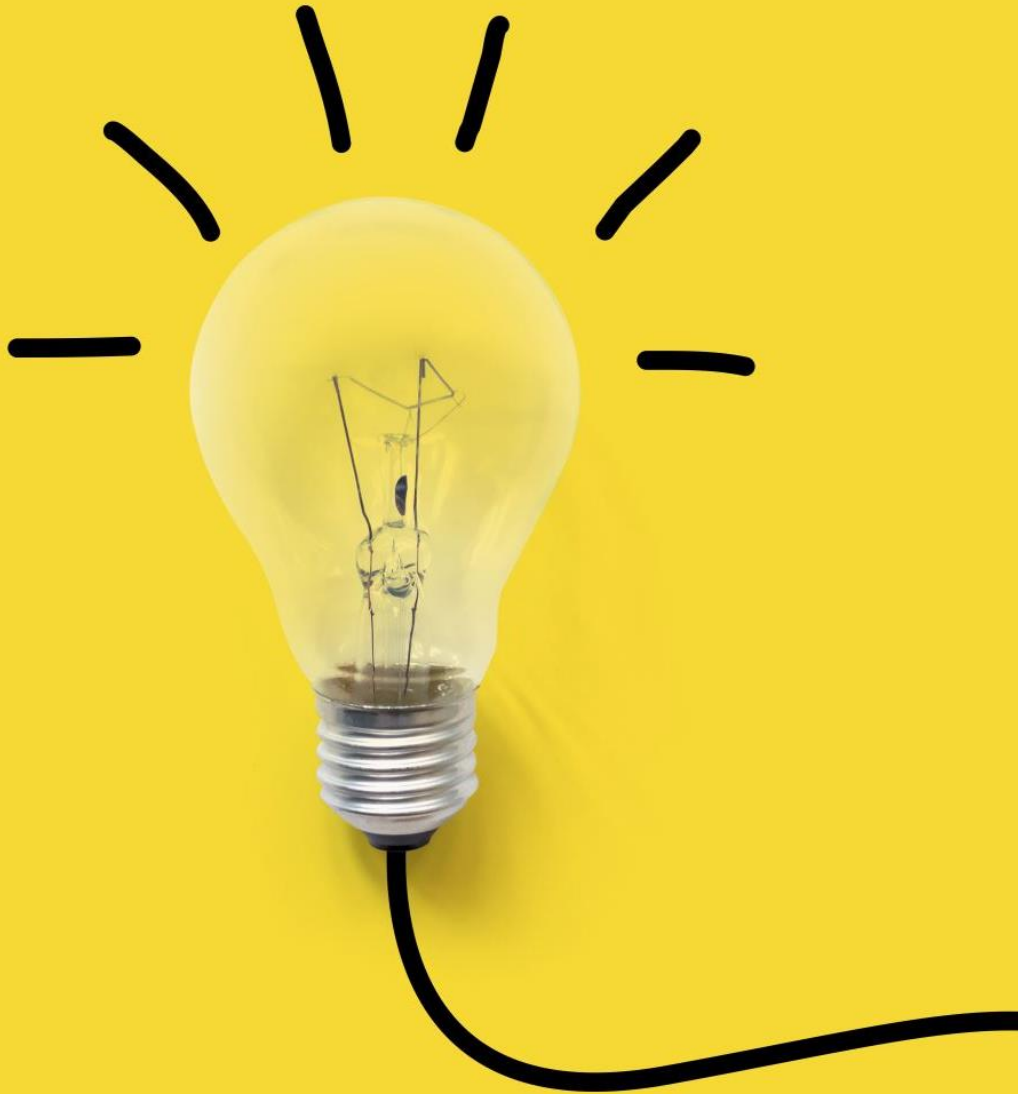
Outcome & Benefits

Solution & Outcome:

- Tina's proactive approach helped ensure that business processes are keeping up with business growth and that staff are properly following statutory & regulatory requirements.

Benefits:

- Reduction in audit findings or company fines
- Properly trained staff; safer work environment
- Better adherence to processes & procedures



Continuous Improvement

Continuous Improvement with ChatGPT



Customer / Supplier feedback



Audit results



Change Management

Scenario

Rolling Out a New ERP System

Background:

- Kate, the Owner of Summit Fabrication Co., is always interested in continuous improvement and implementing best practices where possible.

Problem:

- The company is growing quickly, and Kate has decided to implement a new ERP system. She meets with the Leadership team to determine the best next steps.



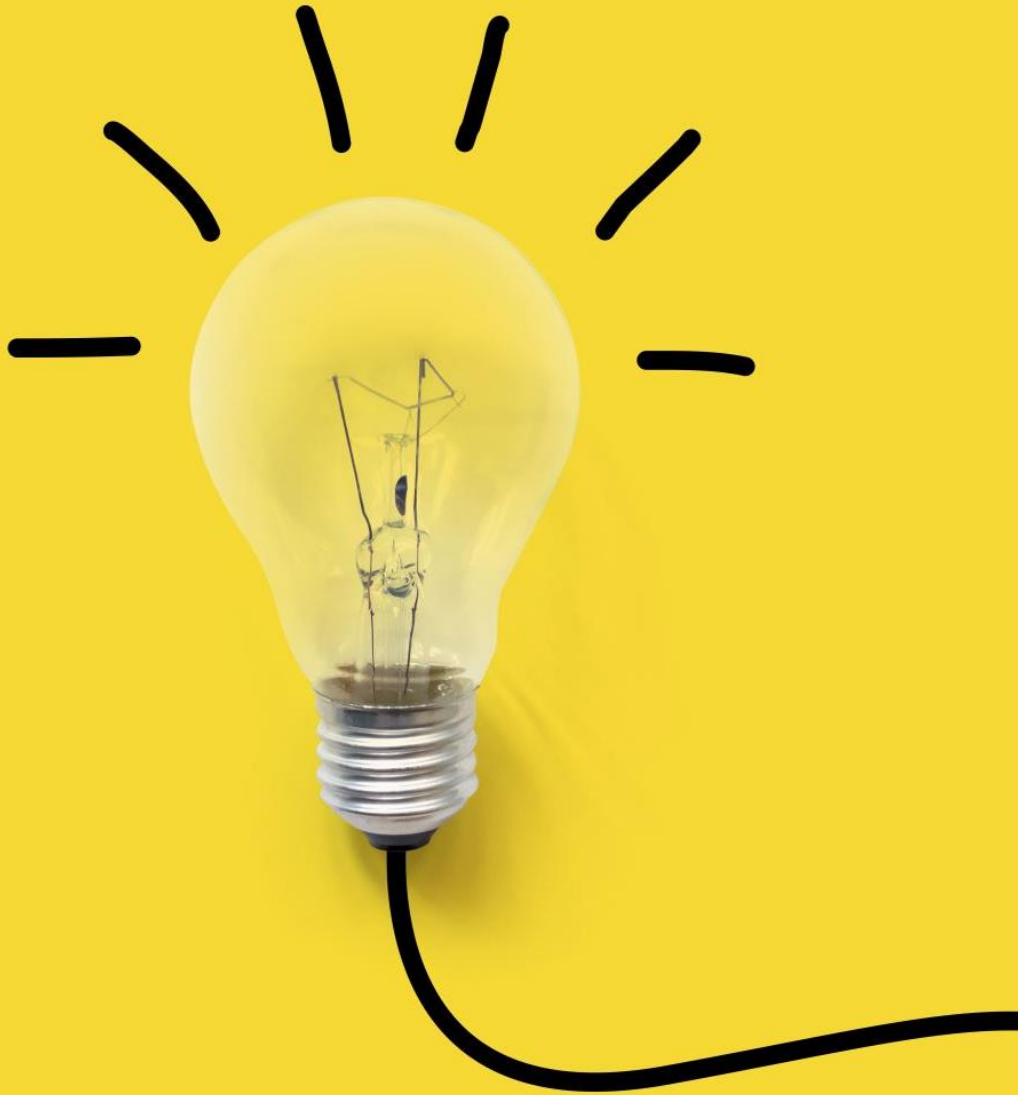
Outcome & Benefits

Solution & Outcome:

- Kate had a better idea, up front, of the risks involved with making this change and now had a more efficient plan for roll out. All of this, along with a plan to communicate with staff, helped ensure a smoother transition.

Benefits:

- Reduction in risk & better cost control
- Smoother transition
- Increased buy-in for the new tool



Optimizing Results from ChatGPT

Task

- use action verbs (e.g., generate, give, write, analyze)

Context

- limit endless possibilities
 - ✓ What is the user's background?
 - ✓ What does success look like?
 - ✓ What environment are they in?

Exemplars

- provide examples

Persona

- who do you want the AI to be (think of someone you wish you had access to for the task you're facing)

Format

- what do you want the end result to look like (e.g., table format with 3 column headers)

Tone

- provide the feeling you are going for (e.g., casual, formal, enthusiastic)

Let's put it all together...

You are a production supervisor for an Assembly process [persona], and you are having continuous issues with poor quality related to frequent turnover of staff [context]. Write an email to your boss, Stephanie Tanner, sharing this news [task]. This email should not be too long and should be conveyed in a positive & confident tone [format & tone]. Use a format like the following [format & exemplar]:

Subject: Concern Regarding [Issue]

Dear [Boss's Name],

I hope this email finds you well. I am writing to bring to your attention a concern that I have regarding [issue]. After reviewing the situation, I believe it is important to discuss this matter with you.

I have noticed that [insert specific issue and examples of behavior or actions]. I am concerned that this behavior may have a negative impact on our team and the company as a whole. I would like to suggest that we discuss this issue in order to find a solution and prevent it from happening in the future.

I would be more than happy to provide you with any additional information or insights that may help you understand the situation better. I would also appreciate any feedback or suggestions you may have on how we can address this issue.

Thank you for your time and attention to this matter. I look forward to hearing from you soon.

Best regards,



Getting Started with ChatGPT



Needs Assessment – identify areas where AI / ChatGPT can provide the most value. Gather feedback from front-line workers



Evaluate Infrastructure – ensure reliable internet connectivity & access to devices (computers, tablets, etc.)



Tool Training – customize & train GPT with manufacturing specific knowledge and company specific SOPs, machine manuals, etc.



Integrate – integrate GPT with existing MRP/ERP or other in-house software

Getting Started with ChatGPT



User Training – train front-line workers; organize workshops & demo sessions to familiarize them with the system



Safety Protocols - set guidelines on when to rely on ChatGPT and when to seek human expertise, especially concerning safety-critical decisions.



Gather Feedback – establish a system for workers to provide feedback; some of this is built into the GPT itself

Ongoing Considerations

- **Continuous Monitoring & Updates:**
 - Regularly update the system with new information, processes, or changes in the manufacturing environment. Monitor performance & uptime.
- **Data Security & Privacy:**
 - Ensure that interactions with ChatGPT are secure and adhere to data protection regulations. Protect sensitive data & intellectual property.
- **Pilot Testing:**
 - Roll it out in a controlled environment or specific section of the manufacturing floor to evaluate its performance. Use insights from the pilot phase to make any necessary adjustments.
- **Scaling & Expansion:**
 - After successful pilot testing, expand the implementation to other areas or departments. Evaluate the need for additional customization or training for different sections.
- **Awareness & Promotion:**
 - Communicate the benefits and capabilities of AI to all employees. Encourage its use and showcase success stories to motivate workers.





Questions

