

Hardware Defect Detected
 • Error 5150-4
 • Error 957-72

PPS Check Passed
 Employee #453-2112

Low Stock Part
 • Part#: 2278-4A4B1

VISION AI OVERVIEW & SOLUTIONS

Leveraging Enabling Technologies to Connect the Entire Manufacturing Enterprise

Our AI Partners



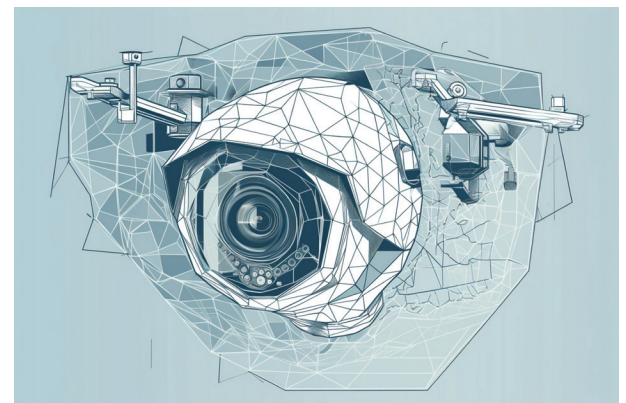
Vision AI is the technology that allows computers to “see” and understand the physical world. It’s been used in bounded use cases for decades and has evolved to become one of the most feasible business applications in artificial intelligence because of its broad applications in production, inspection and quality control, workplace safety, and workplace augmentation. According to Gartner, vision AI represents one of the highest feasibility technologies, allowing manufacturers to drive medium to high business outcomes with high technical feasibility and low risk.

With advances in technology and lowered barriers to entry, Vision AI has also transformed into an unbounded platform for the capture of unstructured data. Capable of solving unique challenges that only Vision AI can accomplish, the technology is now table stakes and further complements Industry 4.0 strategic initiatives by combining structured and unstructured data pipelines to improve data capture, process innovation, and operational excellence.

Challenges

Vision AI is an essential tool for improving revenue, managing costs, and mitigating workforce shortages and other impactful manufacturing headwinds that may be stifling business objectives.

- Workforce and Skillset Shortages
- Cost of Poor Quality
- Compliance
- Productivity
- Traceability
- Workplace Safety
- Scaling Operations in Support of Business Growth



Benefits with Vision AI

Reduce inspection costs by

 **50%**¹

Reduce unplanned maintenance by 30%²



Increase output by

25%



and decrease waste by 15%³



Reduce defect rates by 50%⁴

Robots assisted by vision systems can boost productivity by up to

 **40%**⁵

Vision AI Use Cases

The following highlights some of the most feasible and widely adopted use cases in manufacturing that will get your organization up and running with meaningful business impact:

- **Real-time Quality Control:** High-resolution cameras combined with AI can inspect products at every production stage and identify minute defects that might escape the human eye. This leads to higher quality output, reduced waste, and improved brand reputation. For example, organizations that deployed AI-enabled quality control could see a reduction in defect rates by as much as 50% and save up to 50% on inspection costs. Given its high feasibility and business outcome, quality control is also the most widely adopted use case in manufacturing. If you want to start somewhere-start with quality control use cases.
- **Predictive Maintenance:** Cameras can now monitor equipment for subtle changes in vibration, temperature, movement, or wear patterns. AI algorithms analyze this data to predict potential failures before they occur, preventing costly downtime and ensuring smooth operation. Factory equipment often contributes to costly downtime, and implementing predictive maintenance can reduce unplanned maintenance events by as much as 30%.
- **Optimized Production Lines:** AI can analyze the flow of materials and products on a production line in real time, identifying bottlenecks and suggesting adjustments. This dynamic optimization increases throughput, reduces waste, and improves efficiency. A study found that AI-powered production line optimization can increase output by up to 25% and decrease waste by 15%. This is an excellent example of the evolution of machine vision towards a more holistic capability. Instead of just monitoring a single cell, cameras installed in the ceiling or over production lines now can reference a wide range of situations, allowing organizations to use cameras to gather more systemic insight within the plant and thus transform how they optimize their value stream.
- **Optimized Robotics and Automation:** AI vision enhances the capabilities of robots, equipping them with the ability to navigate complex environments, manipulate delicate objects, and adapt to changes in production workflows. This opens doors to increased automation, improved worker safety, and greater production flexibility. A study by the International Federation of Robotics found that collaborative robots assisted by vision systems can boost productivity by up to 40%.
- **Enhanced Worker Safety:** Most manufacturers track worker safety incidents after they've occurred. Cameras not only help determine the root cause for a particular incident, but they can also be used to identify unreported safety incidents, unreported injuries, and utilized to support a more proactive workplace safety culture. AI vision can detect unsafe practices and hazardous conditions in real-time, triggering alerts and even shut down equipment to prevent accidents. This can significantly improve worker safety and reduce workplace injuries, and ultimately drive the organization to be more proactive about its actions to protect employees.

Vision AI Infrastructure

Cameras, Edge Compute, Networking, Edge Software, whether VMs, Containers, Software, ML Pipelines and Integration with Business Applications, Databases, and Hyperscalers.

Helix Services

- Advisory and Consulting: Understand our manufacturing clients business objectives, challenges, culture, people, and process to identify the most effective use cases to execute vision AI initiatives
- Custom Fixture Design, 3D Printed Prototypes, and Scaled Production Hardware
- Model Design, Training, Optimization, and Maintenance
- Data Orchestration and Automation
- Infrastructure Design: Cameras, Mounting, Networking, Edge Compute, Cybersecurity, Software, and knowledge to implement successful vision AI use cases
- AI Operations, Scale and Use Case Expansion

Let's Build Together

Whether you are starting or accelerating your manufacturing AI journey, tap into Helix's deep manufacturing domain knowledge, data orchestration and artificial intelligence experience, and provide methodology and infrastructure to fit your Vision AI business use cases.

For more information about CNXN Helix Center for Applied AI in Manufacturing, contact one of our manufacturing experts today!

1. •Accenture. (2020, October 29). How AI is changing quality control in manufacturing. 2. •McKinsey & Company. (2020, June 15). Industry 4.0: How smart factories are changing the world. 3. •Accenture (Case Study) Co-creation for smarter manufacturing. 4. •Accenture. (2020, October 29). How AI is changing quality control in manufacturing. 5. •International Federation of Robotics. (2022, December 12). World Robotics Report 2022: Industrial Robots.

Helix Manufacturing Team

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