Applied AI in EHS

From Foundations to Real-World Impact

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INTRODUCTION

Why AI in EHS Needs Clarity

Artificial Intelligence (AI) is everywhere, yet for many organizations, it remains poorly understood. If ten people were asked to define AI, it's likely no two answers would be the same. As of today, there is no single legal or universally recognized definition of AI. The technology itself is still in its infancy, with governments and regulatory bodies actively working to define and govern its use across industries.

As a result, when people talk about "AI," they are often, and sometimes unknowingly, referring to very different concepts. This lack of clarity creates challenges for Environmental, Health, and Safety (EHS) professionals who are being asked to understand, evaluate, and adopt AI responsibly within highly regulated environments.

This guide is designed for EHS professionals, leaders, and decision-makers who want to understand how AI can support their work while maintaining the rigor and accountability their field demands.

For the purposes of this guide, we define AI as an umbrella term that refers to the use of computing machines to solve problems traditionally requiring human intelligence, including pattern recognition, predictive modeling, scenario analysis, and process optimization.

At Cority, we extend this definition further when considering AI's role in EHS. We believe AI should augment human capabilities, not replace them. The goal of AI is to enhance productivity, improve decision-making, and ultimately support a higher quality of life. In EHS, this distinction is critical: technology must empower trained professionals, not attempt to substitute human judgment.

KEY DEFINITION

AI in EHS

The use of computing machines to solve problems traditionally requiring human intelligence, with the goal of augmenting human capabilities, not replacing them.

CHAPTER 1

Understanding AI as a Spectrum of Capability

AI is not a single solution or technology. Rather, it exists along a spectrum, with each level designed to achieve specific objectives.

At one end of the spectrum are basic automation capabilities, such as rules-based workflows or simple field auto-fill functions. At the other end are highly advanced cognitive automation solutions, similar to IBM Watson's ability to independently analyze information and write code.

While advanced cognitive AI can deliver transformative outcomes, it also introduces greater complexity, higher costs, limited availability, and longer implementation timelines. For many organizations, especially within EHS, the most sophisticated AI is not always the most effective choice.

This creates what can be described as the Goldilocks problem. Organizations must determine what level of AI functionality is "just right" for their specific needs: powerful enough to deliver value, but practical enough to implement, trust, and scale.

CRITICAL CONSIDERATION

The most sophisticated AI isn't always the most effective. Success comes from finding the right balance: powerful enough to deliver value, practical enough to implement and trust.

CHAPTER 2

The Purpose of AI: Human and Machine Working Together

When evaluating AI, it's important to remember that usefulness is not defined by novelty or complexity. Some of the most impactful AI solutions are those that are relatively simple, easy to implement, and narrowly focused on a specific outcome.

In practice, AI and human involvement converge in three primary scenarios:

- Tasks in which AI clearly outperforms humans, such as processing large volumes of data at speed and scale.
- Tasks in which AI falls well short of human capability, including assessing human intent, behavior, or providing direct safety support.
- Tasks where outcomes are significantly improved when humans leverage AI to augment their skills and decision-making.

In the context of EHS, AI currently excels at repetitive tasks, data collection, aggregation, and analysis, often at a scale far beyond human capability. Conversely, AI remains limited in areas requiring contextual understanding, ethical judgment, and human interaction.

When combined thoughtfully, however, AI and human intelligence can form a powerful partnership, enabling stronger insights, better decisions, and more proactive risk management.

THE PARTNERSHIP PRINCIPLE

AI excels at
Speed, scale, pattern recognition, data processing

Humans excel at
Context, judgment, ethics, human interaction

Together
Stronger insights, better decisions, proactive risk management

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CHAPTER 3

How AI Is Transforming the EHS Sector

Having established what AI is and how it complements human expertise, we can now explore how these concepts translate into practical transformation within EHS programs.

EHS programs have historically relied on manual processes and reactive approaches. Today, Applied AI is helping organizations transition toward more proactive, data-driven models.

AI is already being used to automate highly manual and repeatable tasks such as data collection, quality assurance, risk analysis, and notification workflows. By reducing administrative burden, organizations can free up valuable time for EHS professionals to focus on higher-value initiatives.

Beyond automation, AI is increasingly leveraged to generate actionable insights from historical performance data and emerging trends. These insights allow organizations to forecast potential risks, identify leading indicators, and anticipate future performance outcomes.

Importantly, this transformation is not about replacing EHS professionals—it is about augmentation. AI supports decision-making, surfaces insights from large datasets, and enables new forms of interaction and communication within EHS workflows.

TRANSFORMATION IN ACTION

Today's AI enables EHS teams to

- Automate repetitive data collection and quality assurance
- Generate actionable insights from historical trends
- Forecast risks and identify leading indicators
- Focus time on strategic safety initiatives

CHAPTER 4

Core AI Use Cases Across the EHS Lifecycle

Understanding how AI transforms EHS requires moving from theory to application. Several AI use cases have emerged as particularly well suited to EHS environments, each addressing different aspects of the safety and compliance lifecycle:

Task Assistance

AI-powered task assistance focuses on increasing efficiency by automating repetitive administrative work and streamlining workflows. This enables EHS teams to spend less time on manual tasks and more time on strategic safety initiatives.

Insights and Artifacts

In this category, AI helps detect, interpret, and classify patterns within collected data. By surfacing relevant insights more quickly, AI supports better-informed decisions and more timely action.

Expert Solutions

Expert solutions leverage machine learning tools such as computer vision to interpret complex data. These capabilities reduce user burden during data collection and provide prescriptive guidance to support point-in-time decisions.

Personalization and Engagement

AI can also curate more intuitive and adaptive user experiences within EHS software. By learning from user behavior, preferences, and actions, AI can improve engagement, strengthen safety culture, and support better program outcomes.

CHAPTER 5

From AI to Applied AI in EHS Workflows

While AI as a concept can feel abstract, Applied AI brings practical value to EHS organizations.

Cority defines Applied AI as the use of proven AI capabilities embedded directly into standardized EHS workflows. Rather than introducing entirely new systems or processes, Applied AI integrates seamlessly into the tools EHS professionals already use.

This distinction matters because AI often struggles to demonstrate real-world value when deployed without context. Applied AI focuses on solving tangible problems such as improving compliance, reducing risk, and simplifying reporting.

For example, Applied AI can automatically surface trends across thousands of incident reports, validate inspection data in real time, or generate summaries for leadership, all without requiring users to change how they work.

Cortex AI, Cority's EHS AI software, represents one example of how these principles can be applied in practice, deploying AI agents across operations to help teams focus on their most important work while maintaining trust, transparency, and control.

APPLIED AI VS. STANDALONE AI

Applied AI integrates into existing workflows you already use

Standalone AI requires learning new systems and processes

Result: Faster adoption, clearer value, less disruption

CHAPTER 6

Generative AI: Opportunities and Risks in EHS

The rise of Generative AI tools such as ChatGPT has sparked significant interest across EHS teams. Generative AI refers to technologies capable of generating text, images, or other data based on patterns learned from training data.

In EHS, Generative AI offers potential value in areas such as summarizing incident reports, identifying trends, or supporting scenario analysis. However, these capabilities also introduce risk if not carefully managed.

Open-ended prompts can lead to misinterpretation, incomplete insights, or fabricated information (sometimes called "hallucinations," where the AI generates plausible-sounding but inaccurate data). Additionally, unregulated data sources can compromise the accuracy and reliability of outputs, a critical concern in regulated environments.

Responsible use requires clear prompts, vetted data sources, and human oversight to ensure outputs are accurate, relevant, and compliant.

GENERATIVE AI: USE WITH CAUTION

Risks in EHS contexts

- Fabricated or inaccurate information
- Misinterpretation of open-ended prompts
- Unvetted data sources compromising reliability

Safeguards required

- Clear, specific prompts
- Vetted, quality data sources
- Human oversight and validation

CHAPTER 7

Ethics, Trust, and Responsible AI Adoption

Ethical considerations are central to the adoption of AI in EHS. AI should complement, not replace, trained professionals, particularly in domains requiring specialized expertise and accountability.

Organizations are encouraged to start with simple, well-defined use cases to build trust and confidence. As users become more comfortable, AI capabilities can be expanded gradually.

Trust is built through transparency, governance, and clear demonstrations of value. When implemented responsibly, AI can enhance safety, sustainability, and efficiency without compromising human oversight.

BUILDING TRUST IN AI

Start simple
Choose well-defined use cases

Be transparent
Explain how AI makes decisions

Show value
Demonstrate clear benefits early

Expand gradually
Build confidence before scaling

Maintain oversight
Keep humans in the loop

CHAPTER 8

The Future of AI in EHS

The journey of AI within EHS is still unfolding. While today's applications focus on automation, insights, and predictive analysis, the real opportunity lies in applying AI more deeply across everyday workflows.

Applied AI enables organizations to move from reactive programs to proactive risk management by embedding intelligence directly into inspections, incident management, reporting, and decision-making. When paired with human expertise, AI can reduce administrative burden, improve compliance, surface leading indicators, and support safer, more sustainable operations, without compromising trust or accountability.

As AI continues to evolve, education, governance, and well-defined use cases will remain essential. Organizations that invest thoughtfully, start with practical applications, and build confidence over time will be best positioned to realize long-term value.

FURTHER LEARNING

- https://www.assp.org/about/artificial-intelligence---safety
- https://www.nist.gov/artificial-intelligence
- https://www.iso.org/files/live/sites/isoorg/files/developing_standards/who_develops_standards/docs/use%20of%20AI.pdf
- https://www.cority.com/blog/the-world-of-ehs-is-changing-cortex-ai-is-the-next-step/
- https://www.cority.com/cortex-ai/

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