Illinois EPA's Approach to AI Adoption

Improving Experience, Efficiency and Environmental Impact

Connecting Purpose and Technology

- Align AI with EPA's mission
- Advance public service through innovation
- Build trust through responsible use
- Ensure AI is a force multiplier, not a replacement

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Strategic Alignment for Impact

Employee Experience

Empower staff with tools that reduce manual work and improve access to information
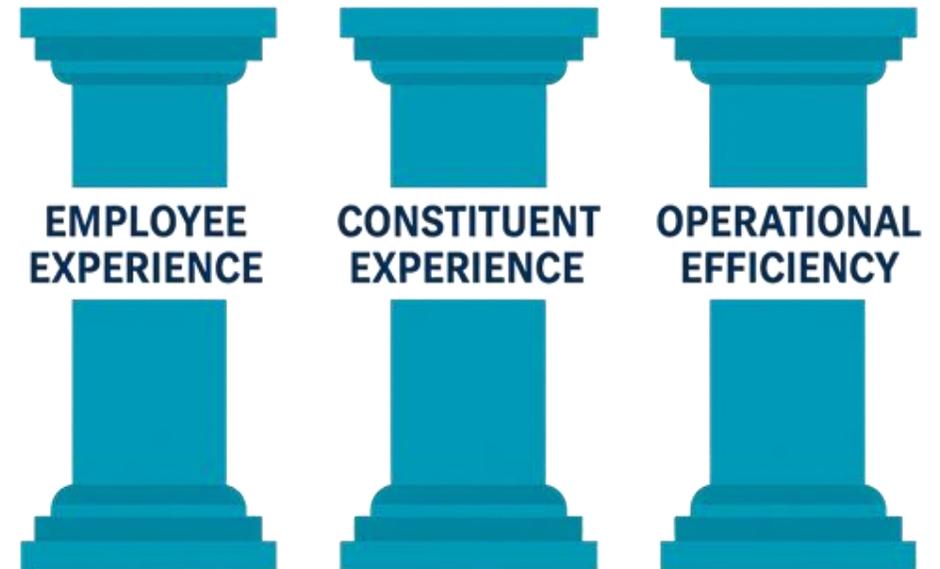
Constituent Experience

Enhance responsiveness, transparency, and clarity in public engagement
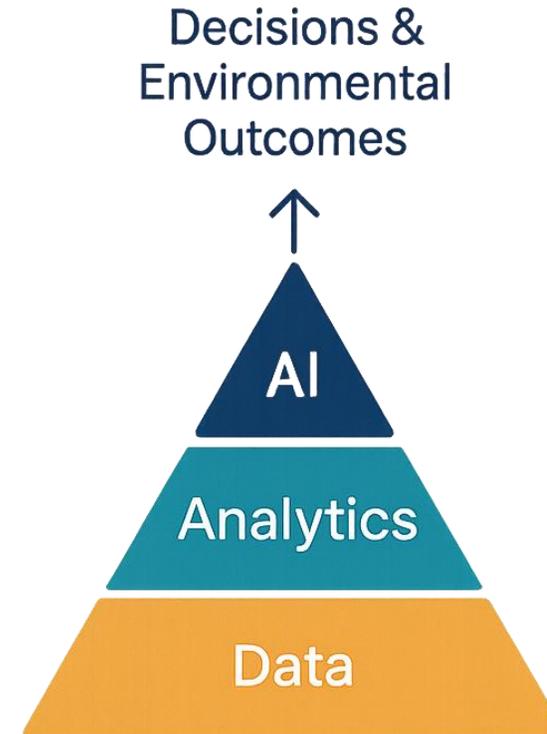
Operational Efficiency

Streamline document handling, data analysis, and routine workflows

STRATEGIC GOALS

EMPLOYEE EXPERIENCE

CONSTITUENT EXPERIENCE

OPERATIONAL EFFICIENCY

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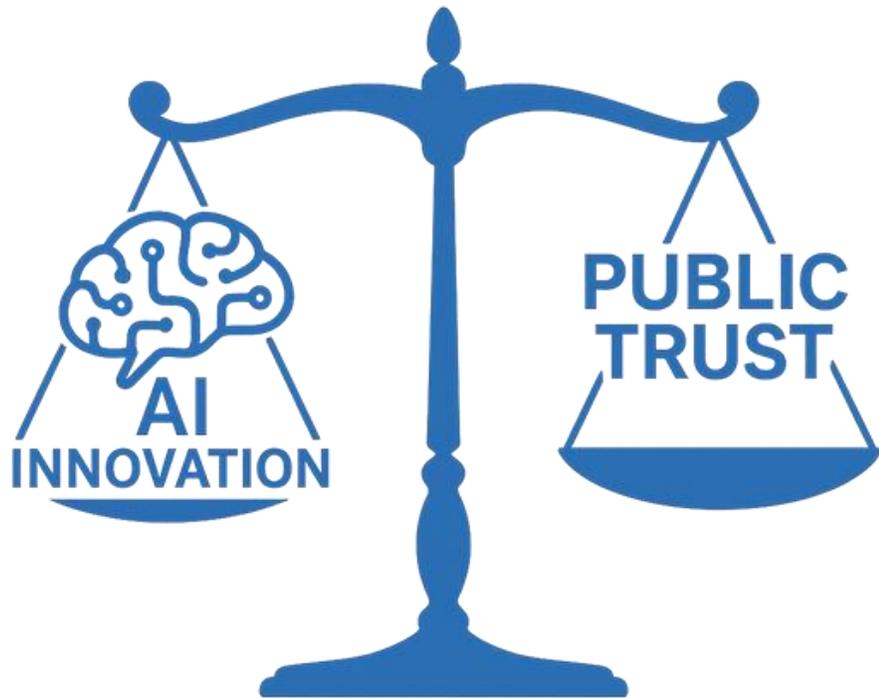Illinois Department of
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Strong Data, Strong Decisions

- **Volume & Variety** – Air quality sensors, compliance records, geospatial data, lab results

- **Quality and Accuracy** – Clean, complete, and validated data to avoid bad outputs

- **Governance** – Clear ownership, definitions, and privacy protections

- **Integration** – Break down silos so data flows where it is needed

Decisions & Environmental Outcomes

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AI

Analytics

Data

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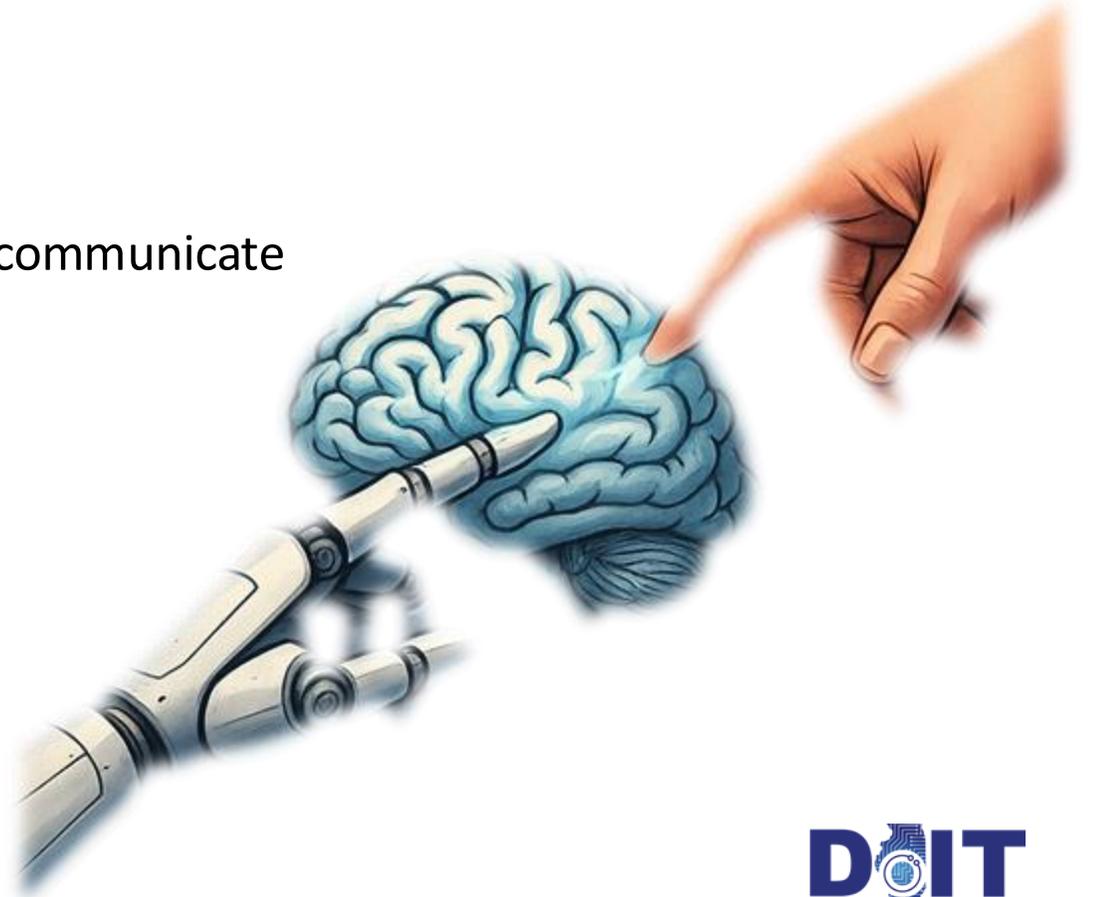Illinois Department of Innovation & Technology

Guardrails for Responsible AI

- Human-in-the-loop

- Transparent Systems

- Clear Accountability

- Ethical Data Handling

- Start Small, Scale Smart

AI 101: Systems that Mimic Human Tasks

- **Machine Learning**: recognizing patterns from data

- **Natural Language Processing**: understanding how we communicate

- **Generative AI**: creating new content

- **Agentic AI**: acts towards goals automatically

- **Bots vs Agents**: scripted vs. adaptive

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AI 101: Prompt Engineering

What It Is

Designing input prompts to obtain better outputs

Why It Matters

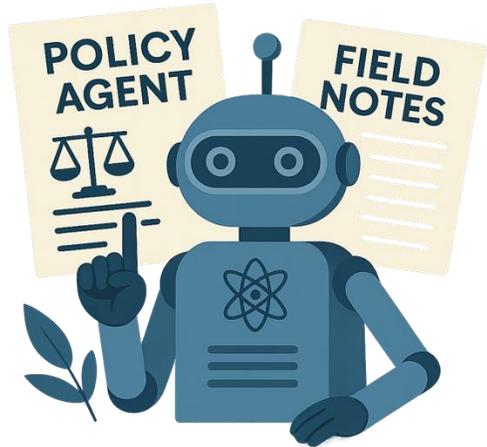Improved prompts can lead to more useful, accurate and relevant results

Create a graphic of an EPA field inspector.

A realistic, professional digital illustration of a field inspector modeled after Director James Jennings of the Illinois EPA. He is wearing a blue EPA field jacket with an ID badge, standing confidently in front of a stream. The style is polished and photorealistic, suitable for use in an official government presentation or publication. A photo of Director Jennings is uploaded for reference.

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Policy Agent for Field Inspectors

- **Challenge:** Reference complex regulations in the field

- **AI Solution:** Agentic assistant suggests citations, drafts NOVs, summarizes field notes

- **Benefits:** Faster processing, fewer errors, reduced manual effort

- **Caveat:** Human review still required

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Permit Application Review and Compliance

- **Challenge:** Manual review of complex permit applications (e.g., NPDES, air emissions) is time-consuming and can have errors

- **AI Solution:** NLP + Machine Learning

  - Parse and interpret application

  - Cross-reference with applicable regulations

  - Identify missing or inconsistent information

  - Flag compliance risks

  - Recommend permit conditions tailored to facility type and environmental context

- **Benefits:** Faster processing, improved enforcement, increased transparency

- **Caveat:** Human oversight for final determination, complex scenarios, and edge cases that require regulatory discretion

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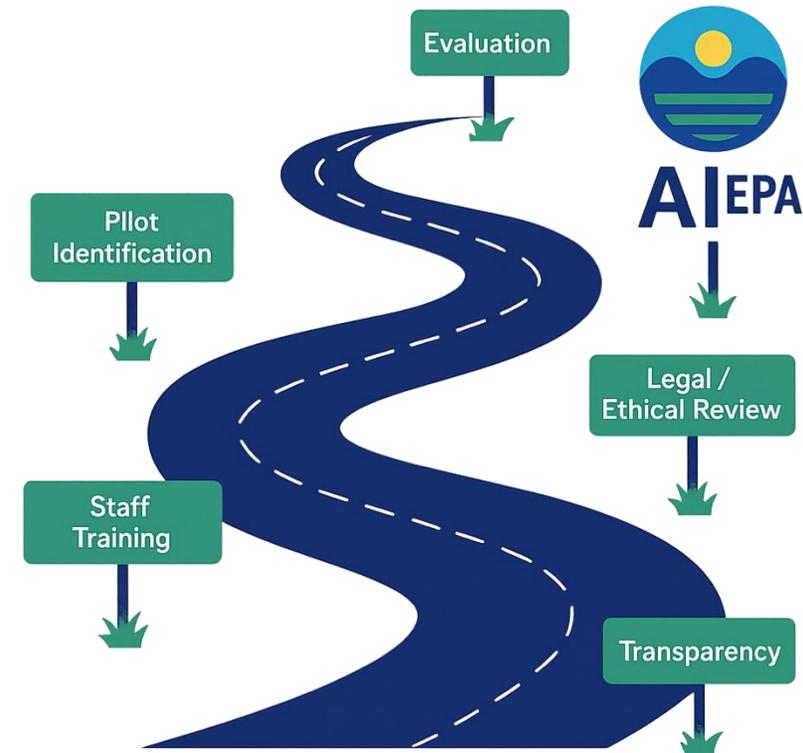
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Inspection Scheduling

- **Challenge:** Manual scheduling of inspections can lead to inefficient resource allocation and higher-risk sites may be overlooked while lower-risk sites are visited too frequently

- **AI Solution:** Machine Learning and Data Analytics

  - Analyze historical inspection records, violations, permits and compliance trends

  - Integrate geospatial and environmental risk data

  - Score and rank facilities by risk and potential impact

  - Generate optimized inspection schedules

- **Benefits:** Maximize inspection value, improve outcomes, increase efficiency in fairness and resource allocation

- **Caveat:** AI should assist not replace human-decision making. Final scheduling should incorporate inspector knowledge, local context, and real-time conditions.

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Implementation Pathway

- Identify and prioritize high-impact pilot areas

- Establish governance

- Train and engage staff early

- Ensure ethical and legal review

- Evaluate outcomes before scaling

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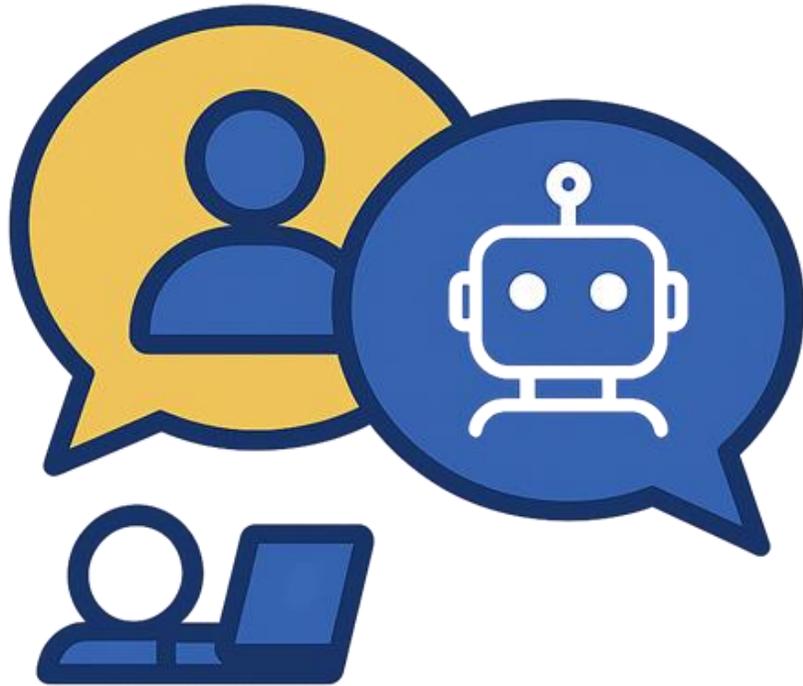Illinois Department of
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Challenges and Risks

- Bias & Fairness

- Transparency & Explainability

- Privacy & Security

- Trust & Change Management

- Over-Reliance On Automation

Closing and Q&A

- AI is a force multiplier
- EPA has a duty to lead responsibly
- Let's learn from each other

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