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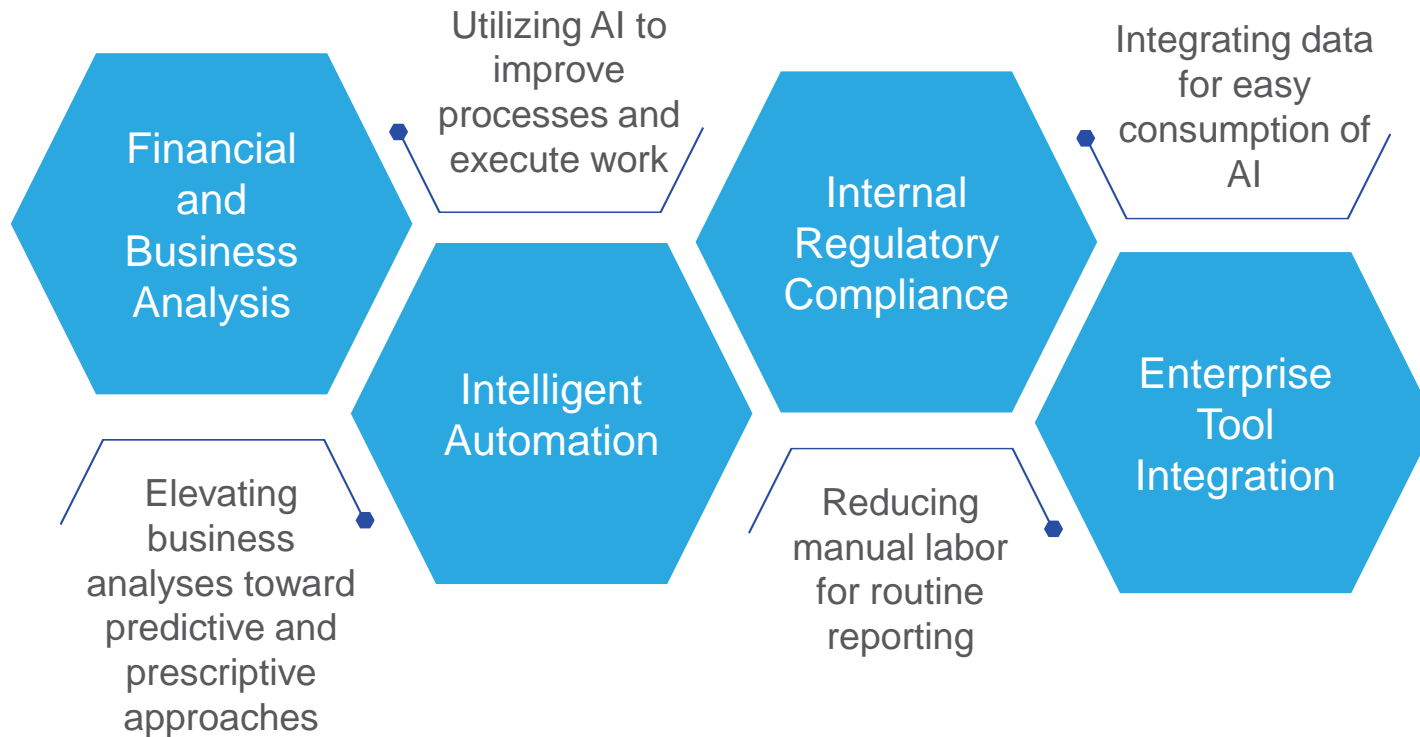
Artificial Intelligence at INL

Battelle Energy Alliance manages INL for the
U.S. Department of Energy's Office of Nuclear Energy



Idaho National Laboratory

M&O opportunities: Integrating AI into everyday use as a utility, enabler and driver



Our 5-year goal is for AI to be embedded across multiple channels, tools, and solutions providing key insights, measures, efficiencies, intelligent automations, and research outcomes.

VISION

AI that is instantly available, enabling the business and operations to make the right decisions, to see and exploit opportunities and to drive the business forward

DRIVERS

- New insights and improved decision making
- Reduce and eliminate highly repetitive and mundane work
- Improved process resiliency
- Improved tools for innovation
- Improved workforce competency and engagement



Current AI Usage

AiVA – INL’s “AI Virtual Assistant”

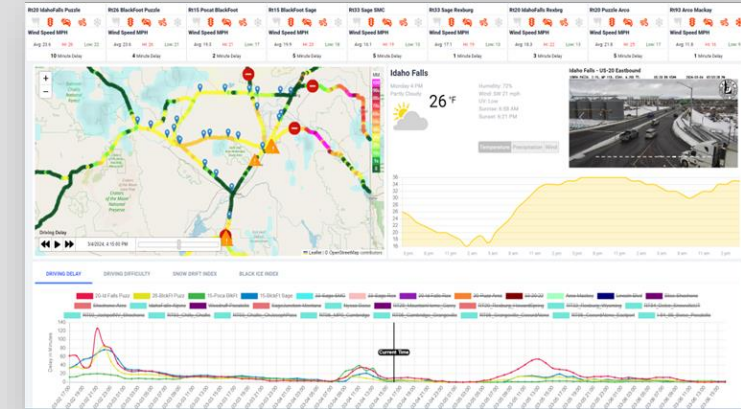
- AiVA leverages Microsoft OpenAI ChatGPT 4 Turbo on the Azure Gov Cloud, providing a secure, INL network-based AI assistant that meets stringent security and privacy standards.
- Assists employees by providing timely and accurate information, helping to streamline research, enhance productivity, support decision-making, and solve complex problems.
- Designed to answer questions, assist with data analysis, facilitate access to information, and offer support on a wide range of topics relevant to the work at INL, ensuring that staff can focus on their critical tasks in research and development

Key Points

- In-transit data is encrypted
- Input is not shared with others
- Monitoring ensures ethical and appropriate use
- Chat session is forgotten once it ends

IBM Watson Weather Tool

- Using machine learning and analytical models, created a hyper-accurate predictive forecast to the MM level to capture unique microclimate patterns
- Highways and interstate routes in and around INL, as well as major routes in Idaho are displayed in a public facing cloud-based environment
- The weather platform has increased highway safety and given INL a tool to make decisions about weather-related curtailment or delays in operations with a very high degree of certainty



Key Points

- Enhanced Forecast Accuracy
- Advanced Intelligence
- Personalization and User Engagement
- Disaster Preparedness

INL SimSearch Explorer

- INL SimSearch Explorer harnesses the power of artificial intelligence (AI) and machine learning (ML) to streamline searches for applicable operating experience knowledge
- Uses natural language processing to analyze vast amounts of data in the DOE OPEXShare and Occurrence Reporting and Processing System (ORPS) reports based on keyword or phrase searches
- Results are prioritized by their similarity to the search, allowing employees to quickly identify the most pertinent information
- Department of Energy collaboration: The tool is available through an easy code container that any laboratory can set up once they sign a government-use agreement with INL.

Key Points

- Simplified Search
- Unlocking the Potential of AI/ML
- Department of Energy Collaboration:

Future: Strengthen management and operational activities across the lab through AI



Financial and business analysis

- Financial analysis and predictions
- Contract reviews
- Human capital management: Skills analysis and job descriptions
- Ideation and gap exploration
- Predictive maintenance
- Quality control



Intelligent automation

- Real time step-based coaches and assistants
- Resume screening and candidate matching
- Software development and testing
- Content creation
- Technical and knowledge support



Internal regulatory compliance

- Information categorization
- Asset tracking and auditing
- Legal documentation
- Risk assessments, monitoring, and investigations



Enterprise tool integration

- Enterprise-wide solutions
- Exploratory tools
- Low code tools
- Copilots, personas, integrations, model augmentation (RAG)
- Application of modern technologies, patterns and frameworks



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Battelle Energy Alliance manages INL for the U.S. Department of Energy's Office of Nuclear Energy. INL is the nation's center for nuclear energy research and development, and also performs research in each of DOE's strategic goal areas: energy, national security, science and the environment.