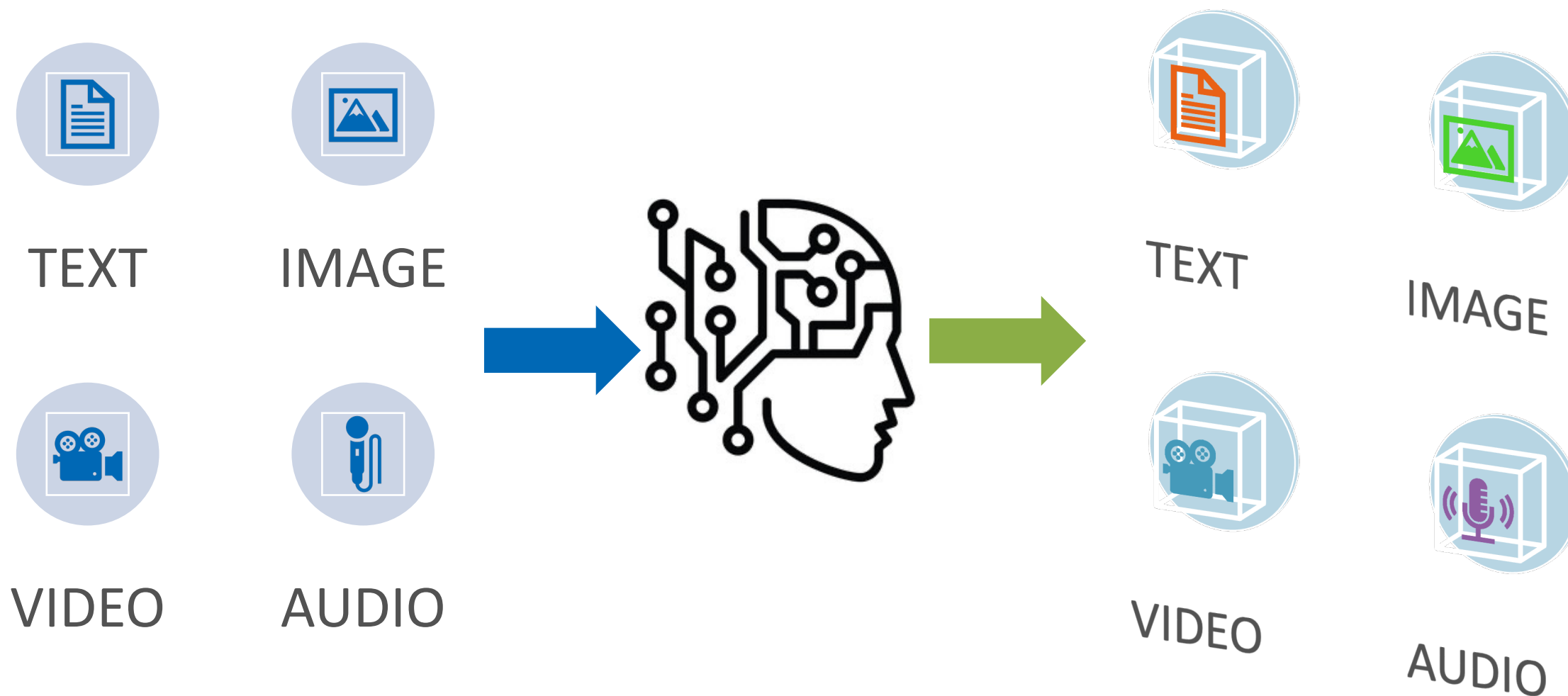


Leveraging Generative AI in the Department of Defense: Opportunities and Challenges

Darren W Pulsipher – Chief Solution Architect Public Sector



Simplified Generative Artificial Intelligence



Use Cases Text-to-Text



Content Creation

- Blog Posts
- Product Descriptions
- Social Media Posts
- Communication Enhancement
- Automated Article Generation
- Translation



Summarization

- Creating newsletters
- Summarizing internal documents
- Reviewing Literature
- SEO Optimized content
- Customer Support



Evaluation

- Form evaluation and summarization
- Report generation
- Log file evaluation
- Status of environment

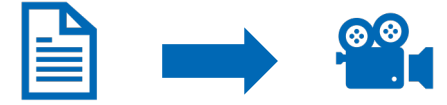
Text to Audio



- Accessibility and Inclusion
- E-Learning and Education
- Podcasting and Audio Content Creation
- Automated Customer Support
- Navigation and Directions
- Entertainment and Gaming
- Language Translation
- Audio Books and Narration
- Public Address Systems

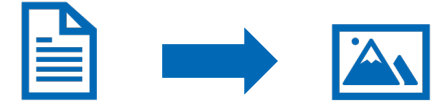
- Assistive Technology
- Automated Voice Responses
- Language Learning Apps
- Medical and Healthcare
- Broadcast and Media
- Museum Exhibits and Tours
- Training Simulations
- Proofreading and Editing

Text to Video Use Cases



- Video Content Creation
- E-Learning and Training
- Visualizing Data
- Storyboarding
- Video Prototyping
- Narrative Generations
- Advertising and Marketing
- Presentations
- Automated Video Responses
- Language Learning
- Content Localization
- Video Summaries
- Social Media Content

Text to Image



- Educational Materials
- Advertising and Marketing
- Web Design
- Fashion Design
- Science Visualization
- Geographic Scenes
- Personalized Content
- Data Visualization
- Concept Visualization
- Story Illustration
- Design and Creativity
- Product Mockups
- Art Generation
- Architectural Visualization
- Interior Design
- Fantasy Worlds

Building New Solutions through Combining AIs

Voice to Text to Text to Text to Video

- Transcribe my podcast create a summary of the podcast then produce it in six languages and generation a social media clip in each language



Text to Text to Text to Video

- Maintenance Crew asks questions of AI that evaluates the current aircraft state and generates a video on how to fix the problems found.



Operating Modalities of GenAI

Public

- AI trained with General knowledge
- Interaction with the general public

Private

- Data from private organizations or individual
- Interaction with people from one organization

Community

- Data from a community of organizations
- Interaction with people from a set of organizations

Managing GenAI Models (Pre-trained Models)

Prompt Engineering

- Low Data Volume
- Low Training Cost
- Low Technical Difficulty
- Low Performance Gain

Prompt Optimization

- Medium Data Volume
- Low Training Cost
- Medium Technical Difficulty
- Medium-High Performance Gain

Fine Tuning

- Large Data Volume
- Medium Training Cost
- Low Technical Difficulty
- Medium-High Performance Gain

Re-enforced Learning

- Large Data Volume
- High Training Cost
- High Technical Difficulty
- High Performance Gain

Opportunities of Generative AI in the DoD

IMAGE AND VIDEO ANALYSIS
FOR ENHANCED ISR
CAPABILITIES

CYBERSECURITY AND THREAT
DETECTION

NATURAL LANGUAGE
PROCESSING FOR
COMMUNICATION AND
INTELLIGENCE ANALYSIS

DECISION SUPPORT SYSTEMS
FOR IMPROVED STRATEGIC
AND TACTICAL DECISION-
MAKING

NATURAL LANGUAGE USER
INTERFACE

???

Benefits of Generative AI in Military Applications



Enhanced situational awareness through real-time data analysis



Increased operational efficiency and reduced human workload



Improved decision-making accuracy and speed



Simplification of complex situations and systems

Challenges and Risks

Ethics

Privacy

Bias

Accountability

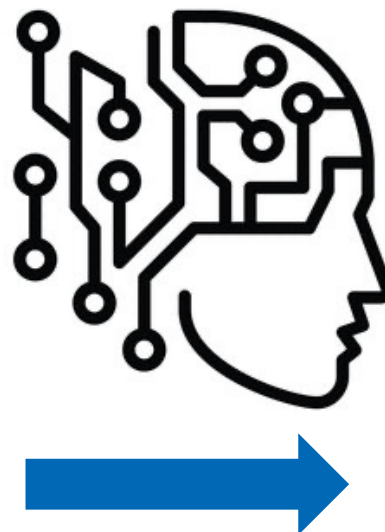
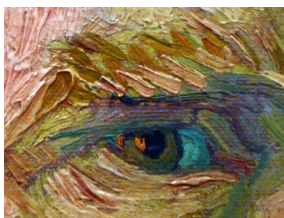
Legal &
Regulatory

Compliance

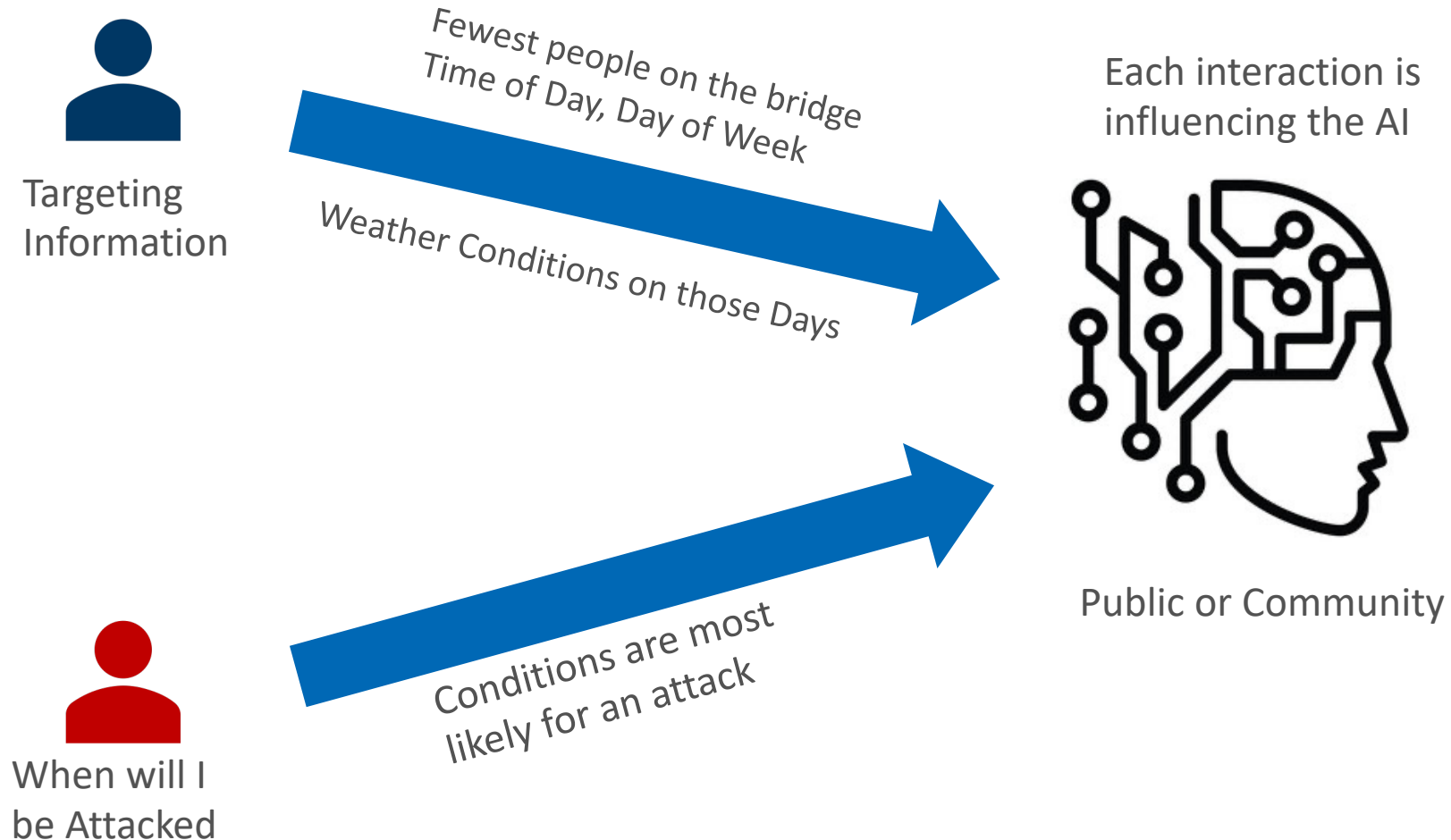
Liabilities

Data Leakage

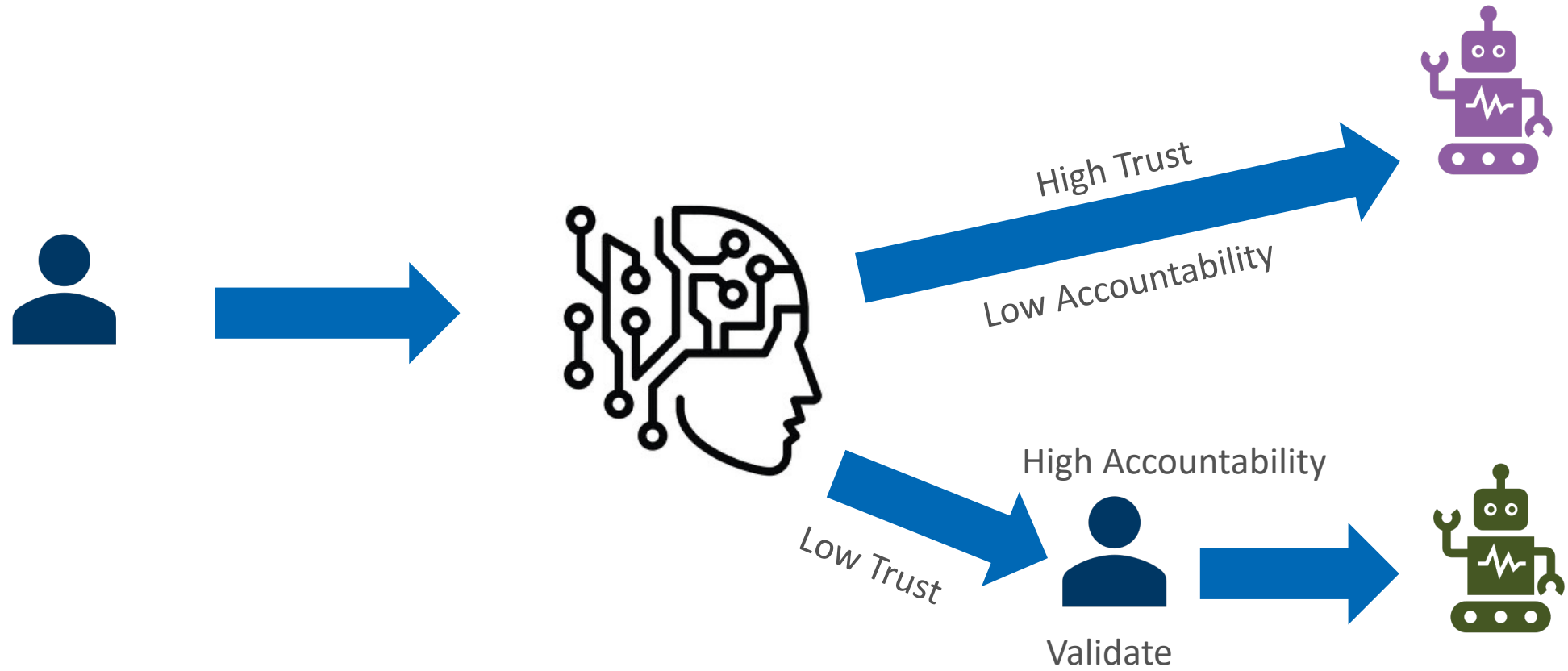
Bias (Training and Generation)



Data Leakage (Generation)



Accountability & Trust



Best Practices for Implementing Generative AI

DETERMINE BEST OPERATING MODALITY

VALIDATE AI RESPONSE WHERE ACCOUNTABILITY IS HIGH

COLLABORATION BETWEEN AI EXPERTS, LEGAL ADVISORS,
AND MISSION OPERATIONS

CONTINUOUS MONITORING AND ASSESSMENT OF AI
SYSTEMS

ESTABLISHING A FRAMEWORK FOR RESPONSIBLE AI USE

ETHICAL GUIDELINES AND PRINCIPLES FOR GENERATIVE AI
APPLICATIONS

Getting More Information

- Embracing Digital Transformation Podcast
- Weekly News Brief
- Interviews with Experts in the field of AI, Cloud, Edge, Cybersecurity, Adv Comms



Getting More Information

- LinkedIn Group
Embracing Digital Transformation
- Email:
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