
AI IN GOVERNMENT
DECEMBER 2022
AI IN GOVERNMENT
FEATURED PRESENTATION
THURSDAY
DEC. 15, 2022
VIRTUAL EVENT
11:30AM-1:00PM EST
cognilytica
DR. CHAKIB CHRAIBI
CHIEF DATA SCIENTIST & ACTING
ASSOCIATE DIRECTOR
NTIS-DEPARTMENT OF
COMMERCE

Agenda

Where AI We?

AI in Gov

NTIS Innovation Framework

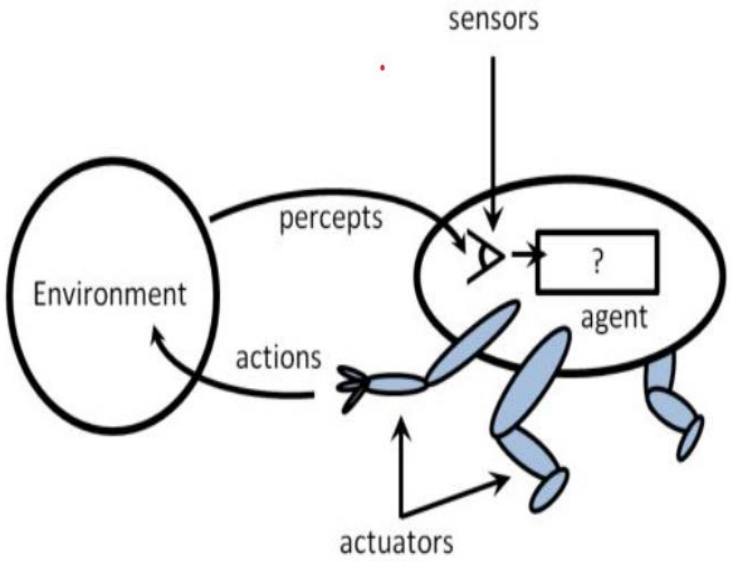
USE CASES

CONCLUSION AND FUTURE DIRECTIONS

Q&A

NTIS: Public-Private Partnership to Accelerate Data Innovation and AI Adoption in Government

AI



NAI/ANI

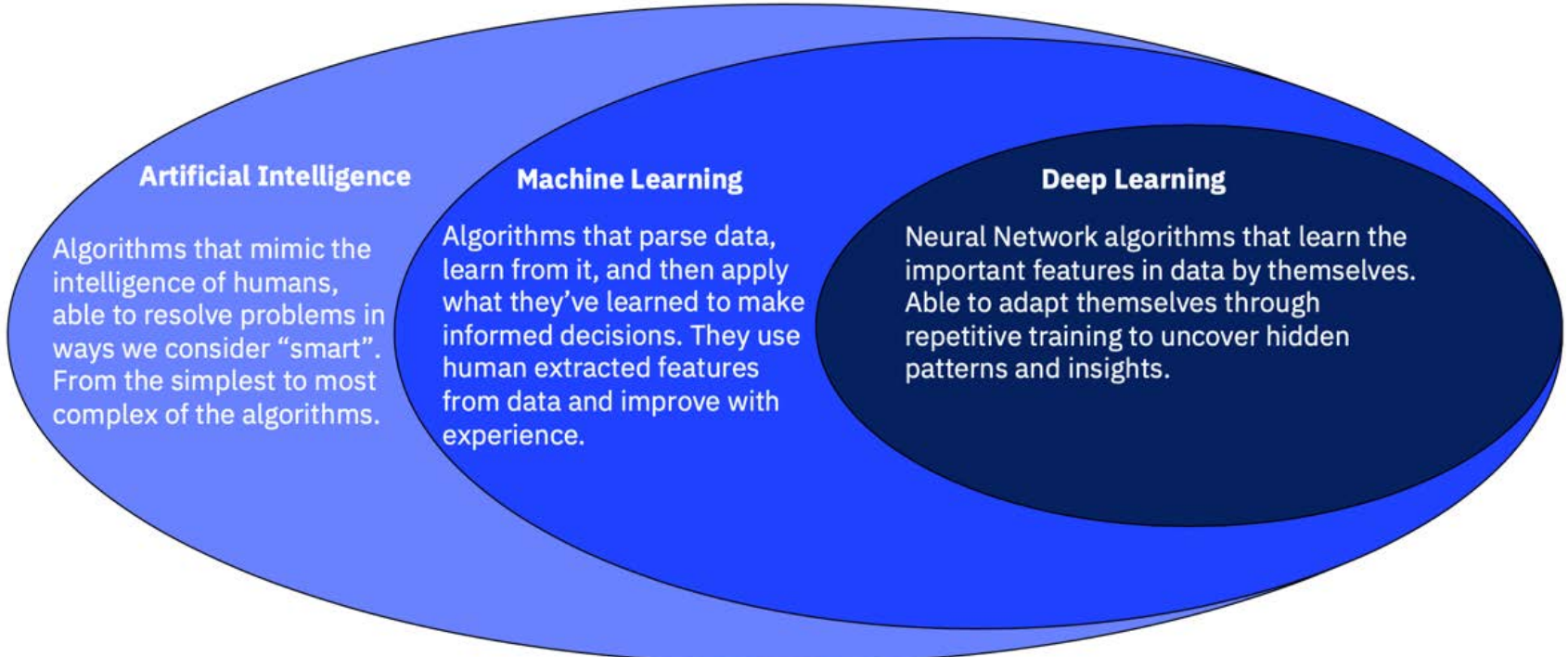
- Narrow/Weak AI
- Application Specific

GAI/AGI

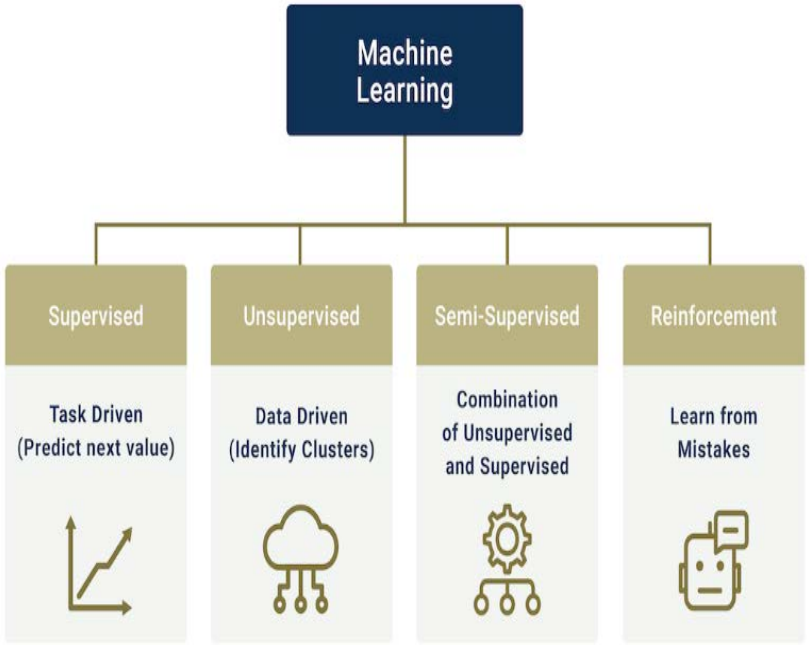
- General/Strong
- Human Intelligent Action

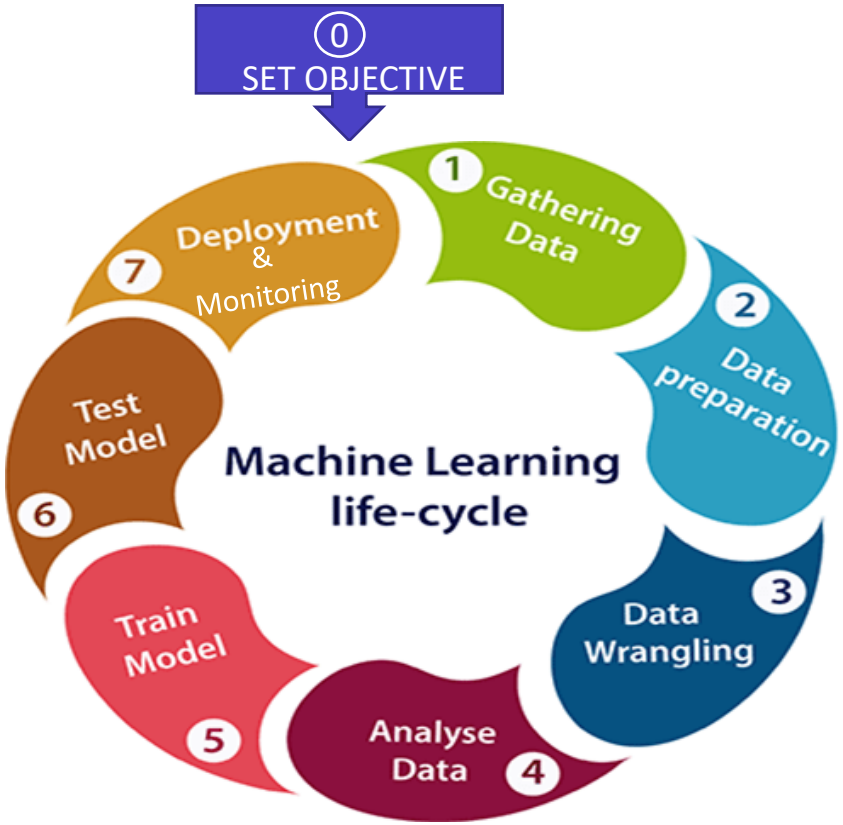
SAI/ASI

- Super
- Exceeds Human Intelligence



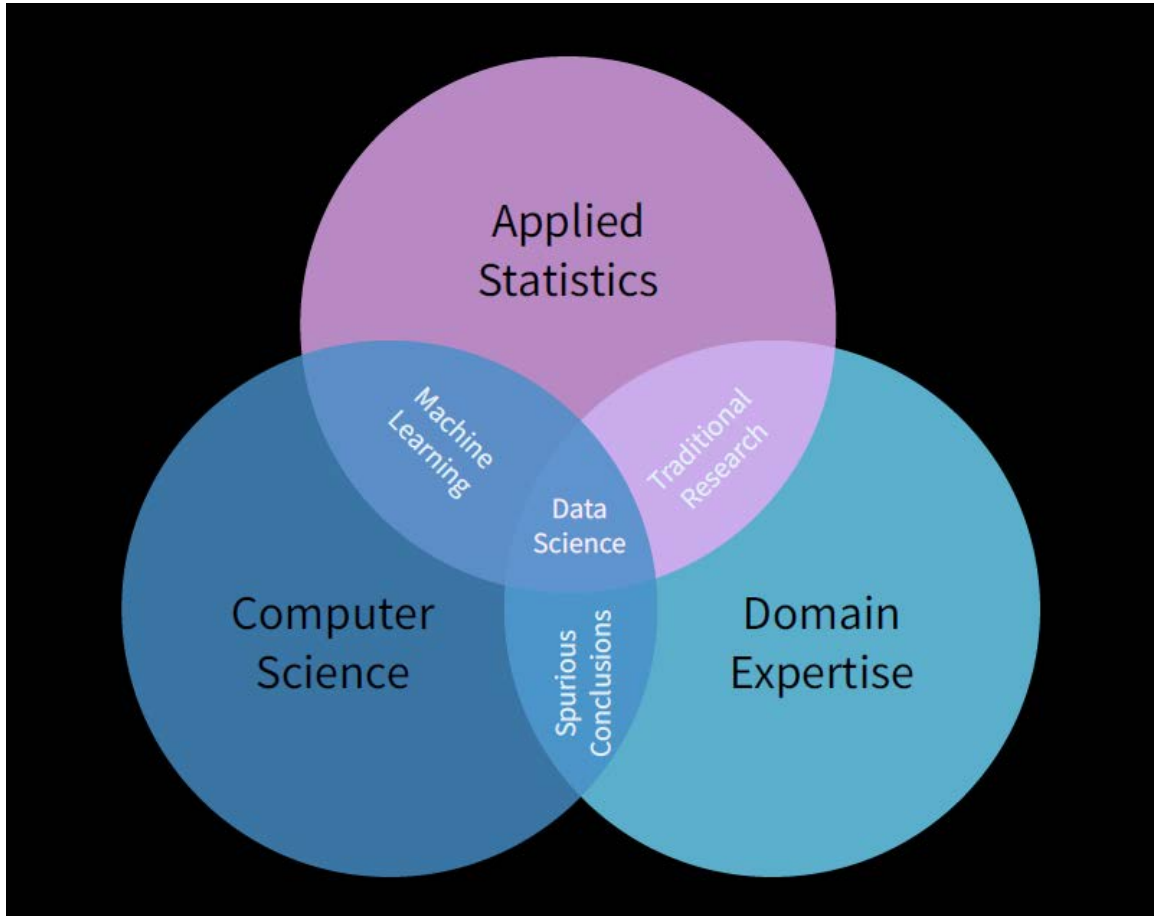
Machine Learning

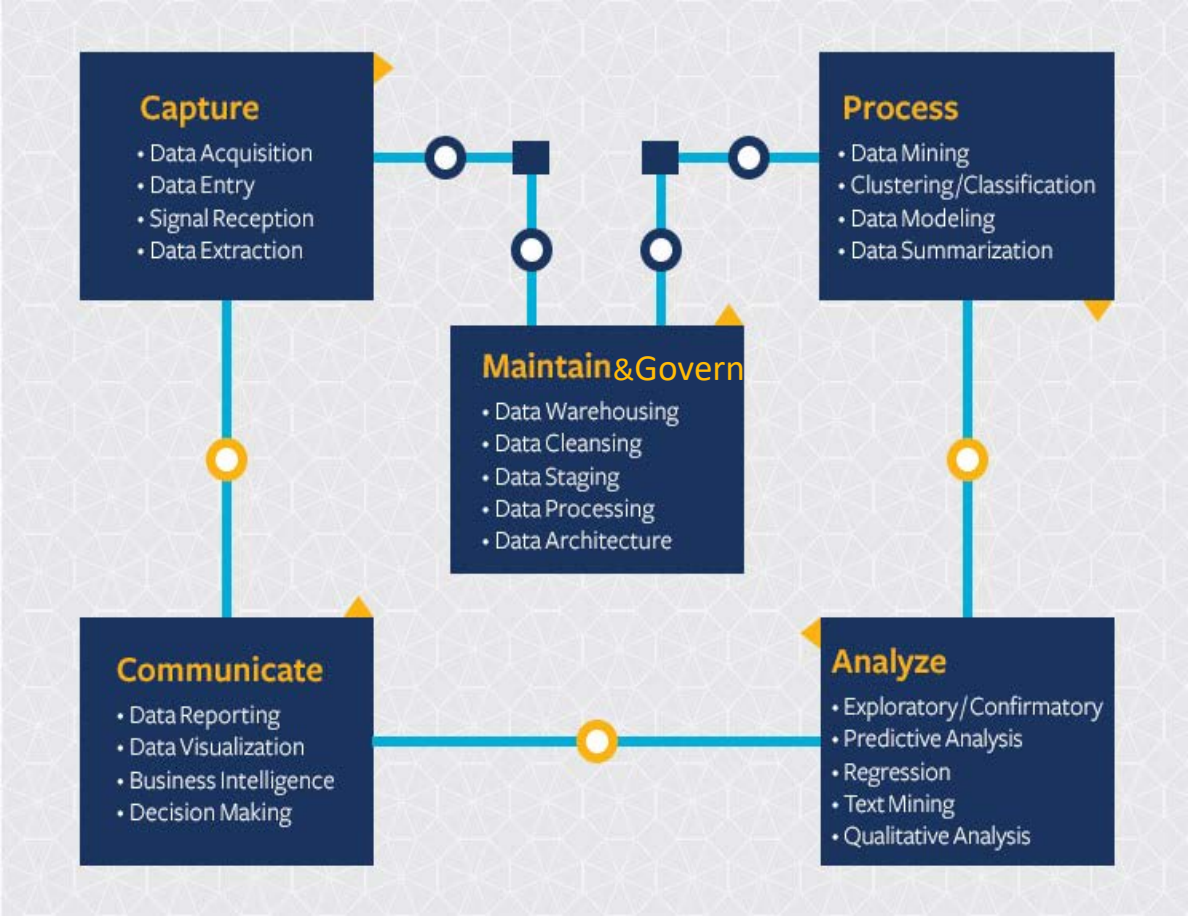




Machine Learning
AI systems that generalize from examples
Deep Learning
AI systems that generalize from examples, in many steps, with intermediate representations

Data Science





Where AI We?

AI is constantly changing our world.

One of the Biggest Problems in Biology Has Finally Been Solved

U.S. Department of Energy expected to announce breakthrough in nuclear fusion research

Use artificial intelligence to combat climate change

World Hunger predicted to be Solved by AI by 2035*

DeepMind breaks 50-year math record using AI; new record falls a week later

MIT solved a century-old differential equation to break 'liquid' AI's computational bottleneck

The discovery could usher in a new generation of weather forecasting and autonomous vehicle driving virtual agents.

" image generated by DALLE-2 with the prompt "man with an ambiguous expression holding a martini in the style of Picasso"

autonomous cars will one day ferry us from place to place.

Scrutinising AI requires holistic, end-to-end system audits

*Fake News

ANI

Artificial Narrow Intelligence
aka
Weak AI

NARROW CAPABILITY

AGI

Artificial General Intelligence
aka
Strong AI

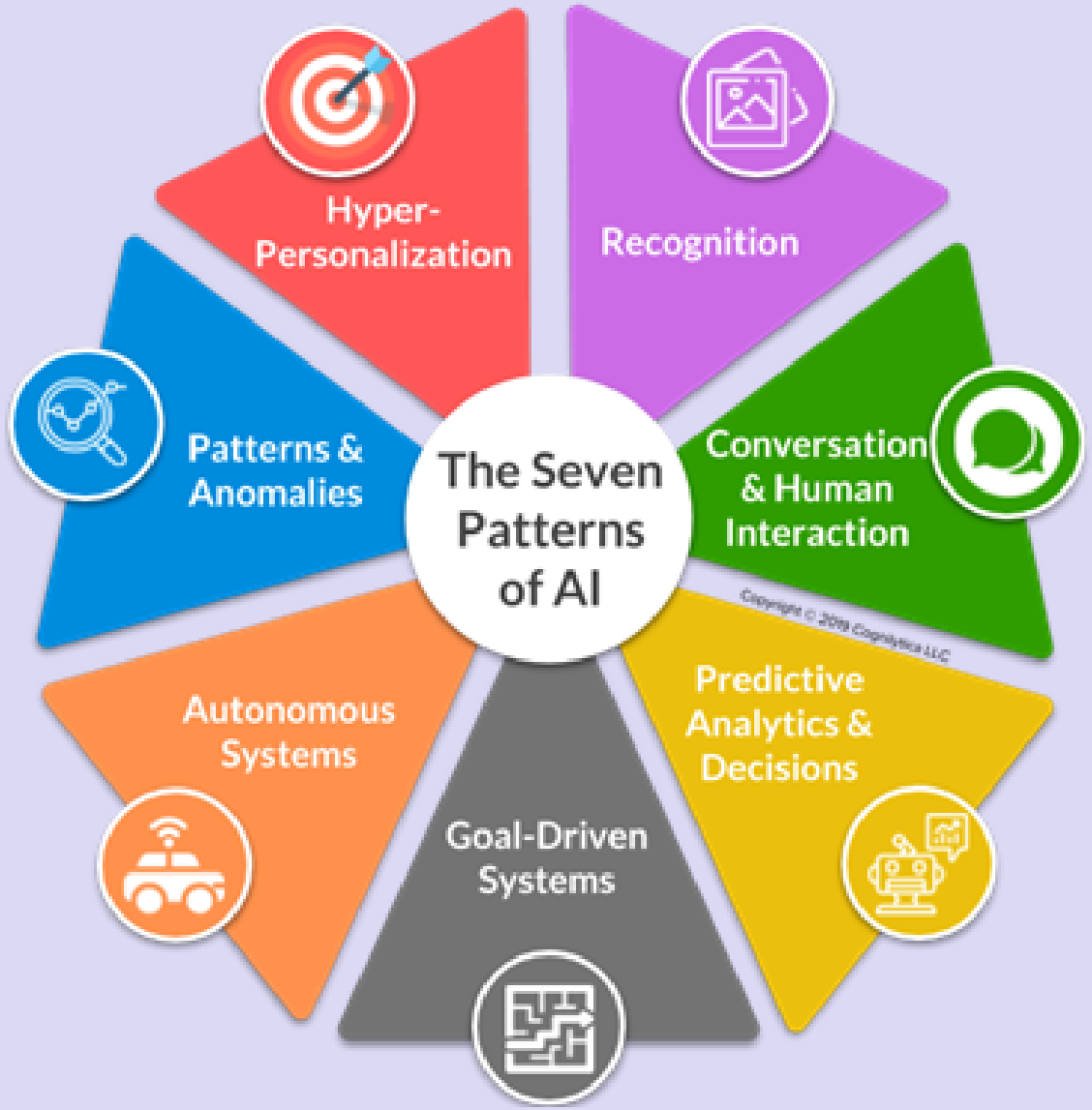
GENERAL CAPABILITY

ASI

Artificial Super Intelligence
aka
Strong AI

TRANSCENDENT CAPABILITY

AI Patterns



Source: Cognilytica

AI Image Recognition

Drones are being used to help save the critically endangered Clanwilliam cedar in the Western Cape

- ✓ Identify and determine objects or other desired things of unstructured content. This content could be images, video, audio, text, or other primarily unstructured data.
- ✓ Image recognition examines each pixel in an image to extract relevant information in the same way that humans do. AI cams can detect and recognize a wide range of objects that have been trained in computer vision.
- ✓ AI enables computers to parse huge swaths of data, learn from disparate inputs, recognize patterns, and adapt decision-making and responses over time.

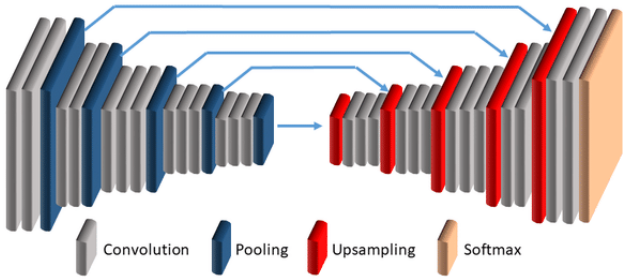
Computer Vision

- Biological Vision Evolution

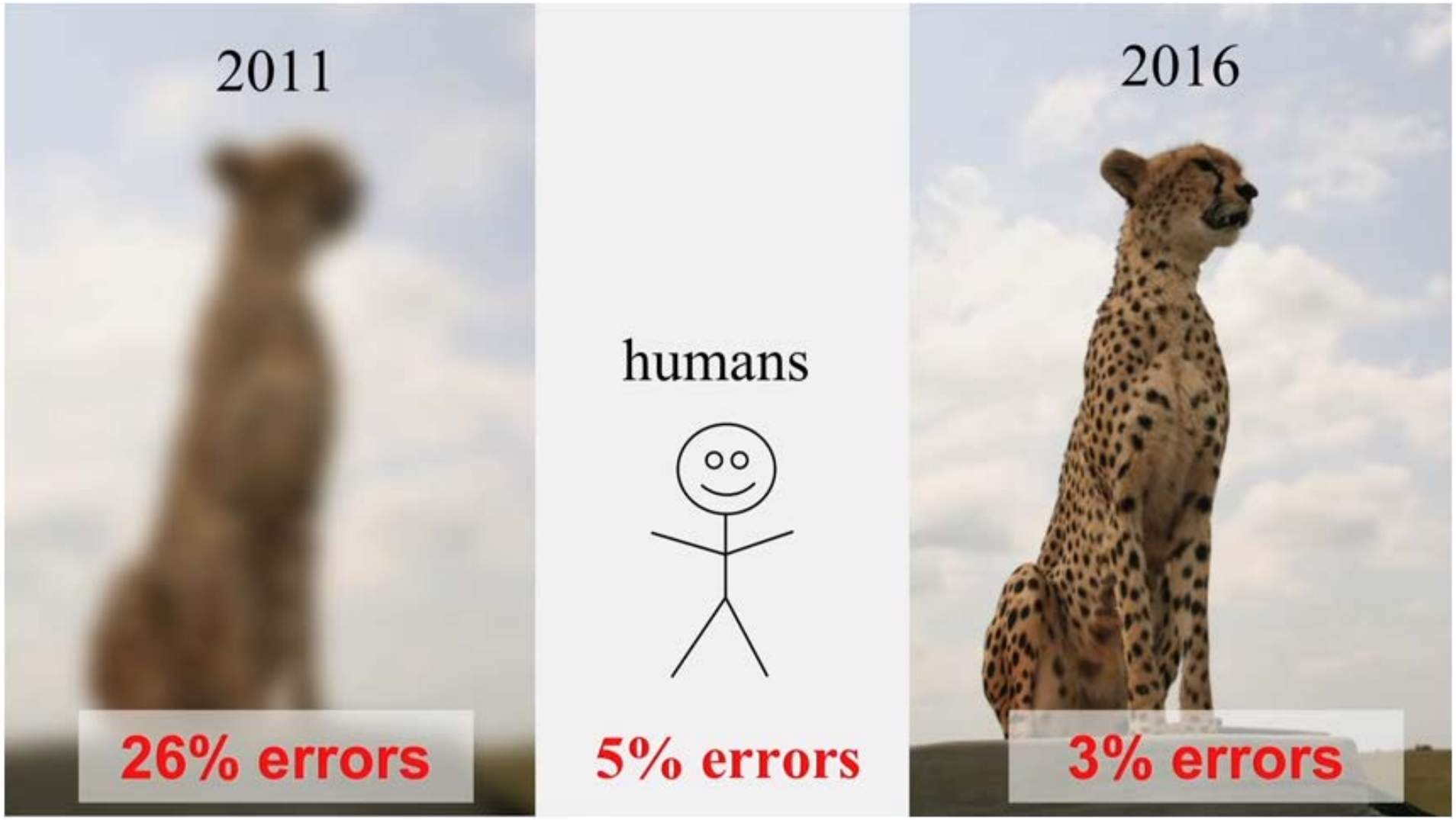
-543 million years

- Machine Vision Evolution

1940s

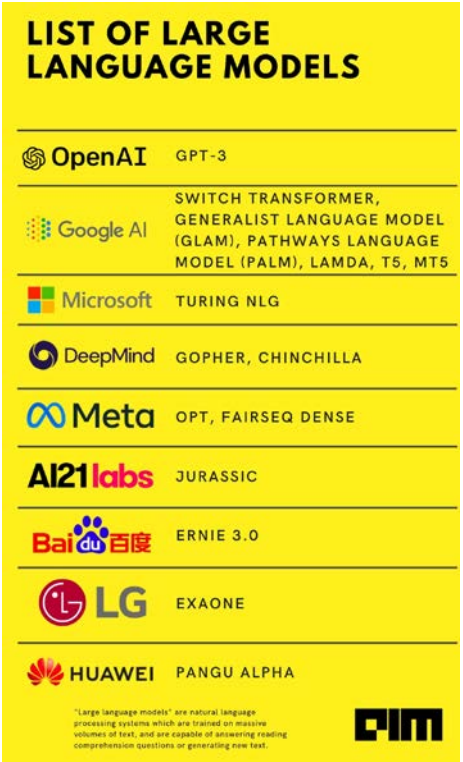


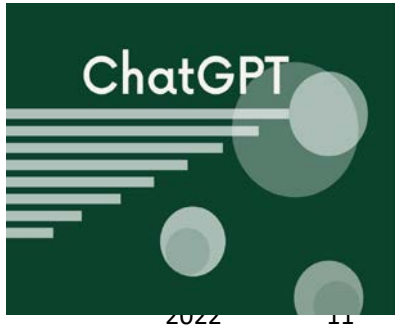
AI vs Human



Conversation and Human Interaction

- AI models are capable of communicating with humans through natural conversation and interaction including voice, text, images, and written forms.
- Large language models (LLMs)—machine learning algorithms that can recognize, summarize, translate, predict, and generate human languages based on very large text-based datasets—are likely to provide the most convincing computer-generated imitation of human language yet.
- Generative Pre-trained Transformer (GPT) is a text generation deep learning model trained on the data available on the internet. It is used for question & answers, text summary generation, machine translation, classification, code generation, and conversation AI. GPT-4 is expected to be released next year to include 100 Trillion parameters!



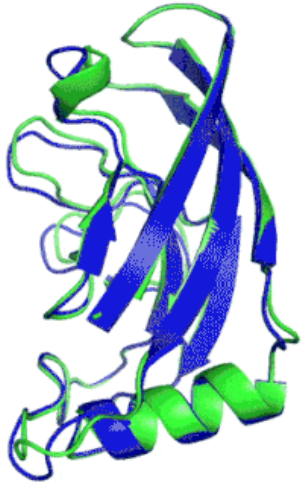


AI for Protein Folding – AlphaFold2

- Nearly everything your body does, it does with proteins. Understanding what individual proteins do is therefore crucial for most drug development and for understanding many diseases. And what a protein does is determined by its three-dimensional shape.
- A protein is made up of a ribbon of amino acids, which folds up into a knot of complex twists and twirls. Determining that shape—and thus the protein's function—can take months in a lab.
- DeepMind has set up a public database that it's filling with protein structures as AlphaFold2 predicts them. It currently has around 800,000 entries, and DeepMind says it will add more than 100 million—nearly every protein known to science—in the next year.

DeepMind AI AlphaFold Solves 50-Year-Old Grand Challenge of Protein Structure Prediction

T1037 / 6vr4
90.7 GDT
(RNA polymerase domain)



T1049 / 6y4f
93.3 GDT
(adhesin tip)

- Experimental result
- Computational prediction

AI Relentless Progress

AI breakthroughs

2016	Object recognition Human parity
2017	Speech recognition Human parity
2018	Machine reading comprehension Human parity
2018	Machine translation Human parity
2019	Conversational QnA Human parity
2020	Image captioning Human parity

Source: Microsoft

AI in Government

Executive Orders

- ✓EO 13859: Maintaining American Leadership in Artificial Intelligence
- ✓EO 13960: Promoting the Use of Trustworthy Artificial Intelligence in the Federal Government
- ✓EO 14035: Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce
- ✓EO 14028: Improving the Nation's Cybersecurity

NATIONAL ARTIFICIAL INTELLIGENCE INITIATIVE

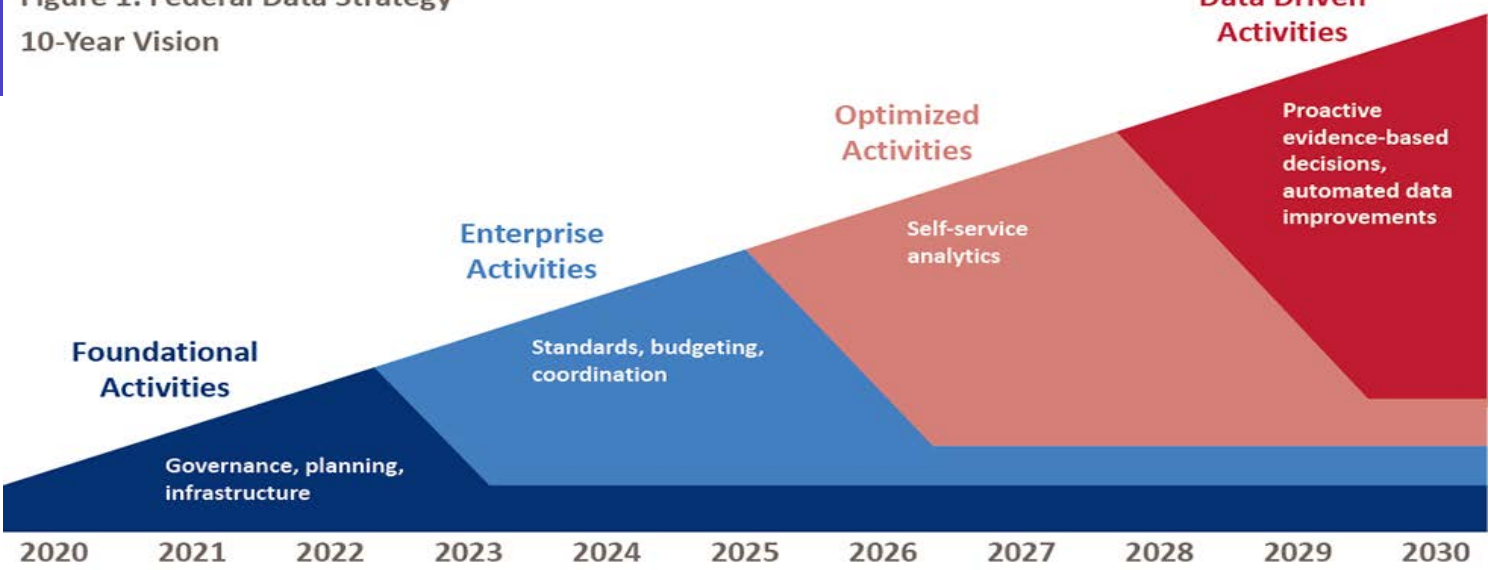
OVERSEEING AND IMPLEMENTING THE UNITED STATES NATIONAL AI STRATEGY

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

BLUEPRINT FOR AN AI BILL OF RIGHTS

MAKING AUTOMATED SYSTEMS WORK FOR THE AMERICAN PEOPLE

Figure 1. Federal Data Strategy 10-Year Vision

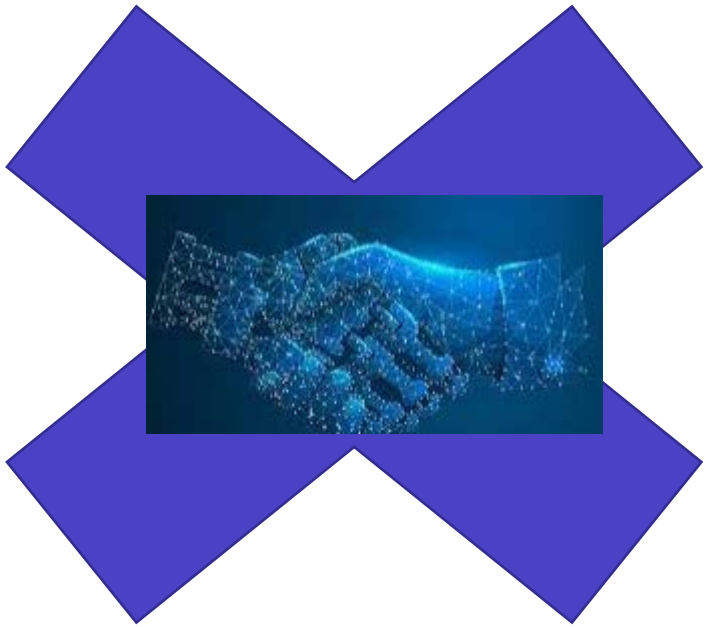


While there are 15 different funding agencies within NAICS 54, 53% of the contracts and 87% of contract value sit within the Department of Defense (DoD).

Source: Brookings Institution

AI Adoption Challenges

- Data Challenge
- Innovation Challenge
- Integration Challenge
- Change Management
- Modern IT Infrastructure
- Scarce Talent



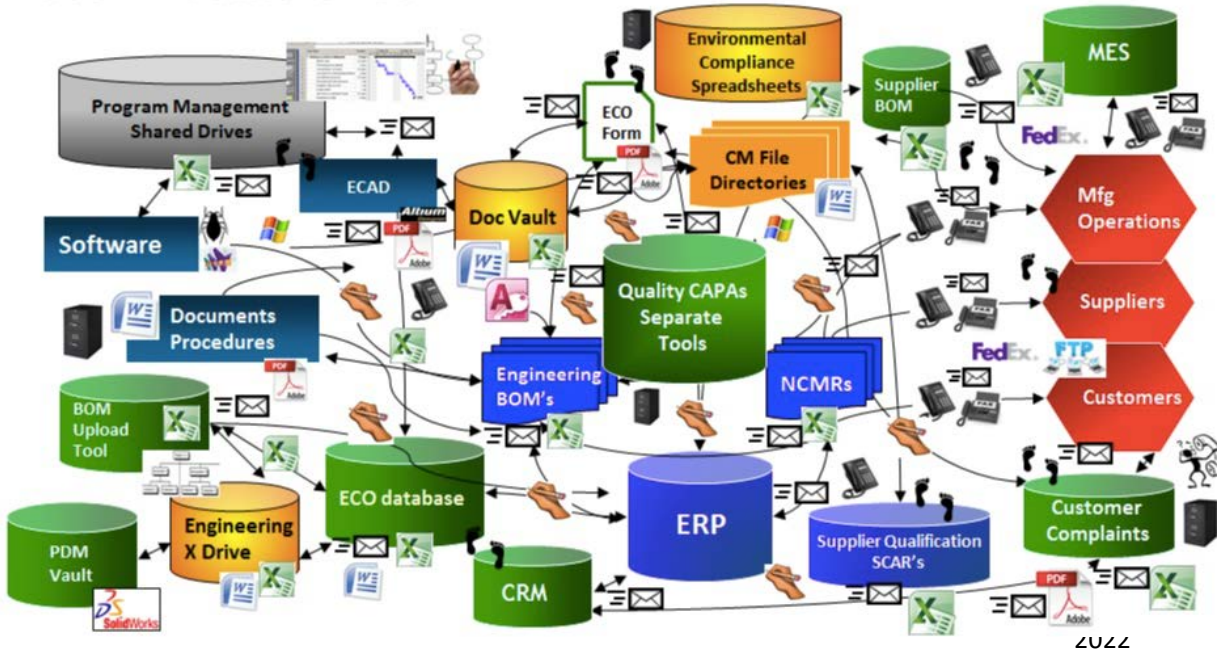
Data Challenge

COVID-19
Coronavirus Disease 2019

The New York Times

Bottleneck for U.S. Coronavirus Response: The Fax Machine

Disconnected Silos



NTIS: Public-Private Partnership to Accelerate Data Innovation and AI Adoption in Government

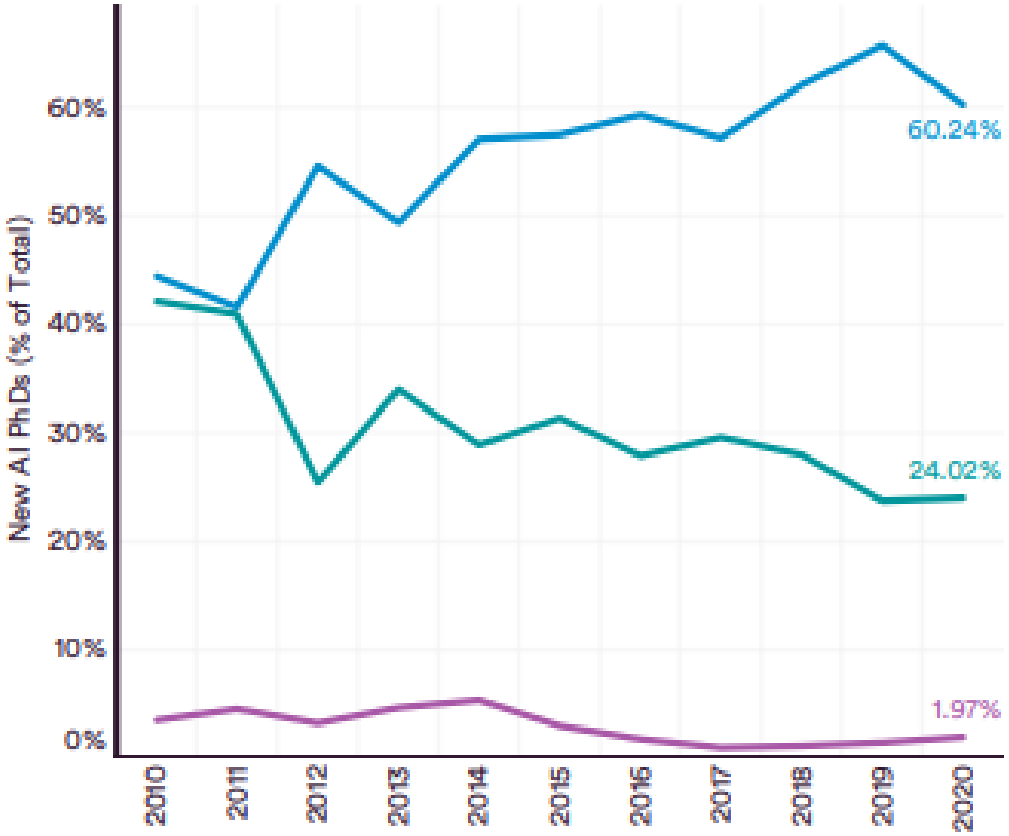
Skills and Workforce

Data Science Talent Gap

The U.S. Bureau of Labor Statistics sees strong growth in the data science field and predicts the number of jobs will increase by about 28% through 2026. To give that 28% a number, that is roughly **11.5 million** new jobs in the field.

EMPLOYMENT of NEW AI PHDS (% of TOTAL) to ACADEMIA, GOVERNMENT, or INDUSTRY in NORTH AMERICA, 2010–20

Source: CRA Taulbee Survey, 2021 | Chart: 2022 AI Index Report



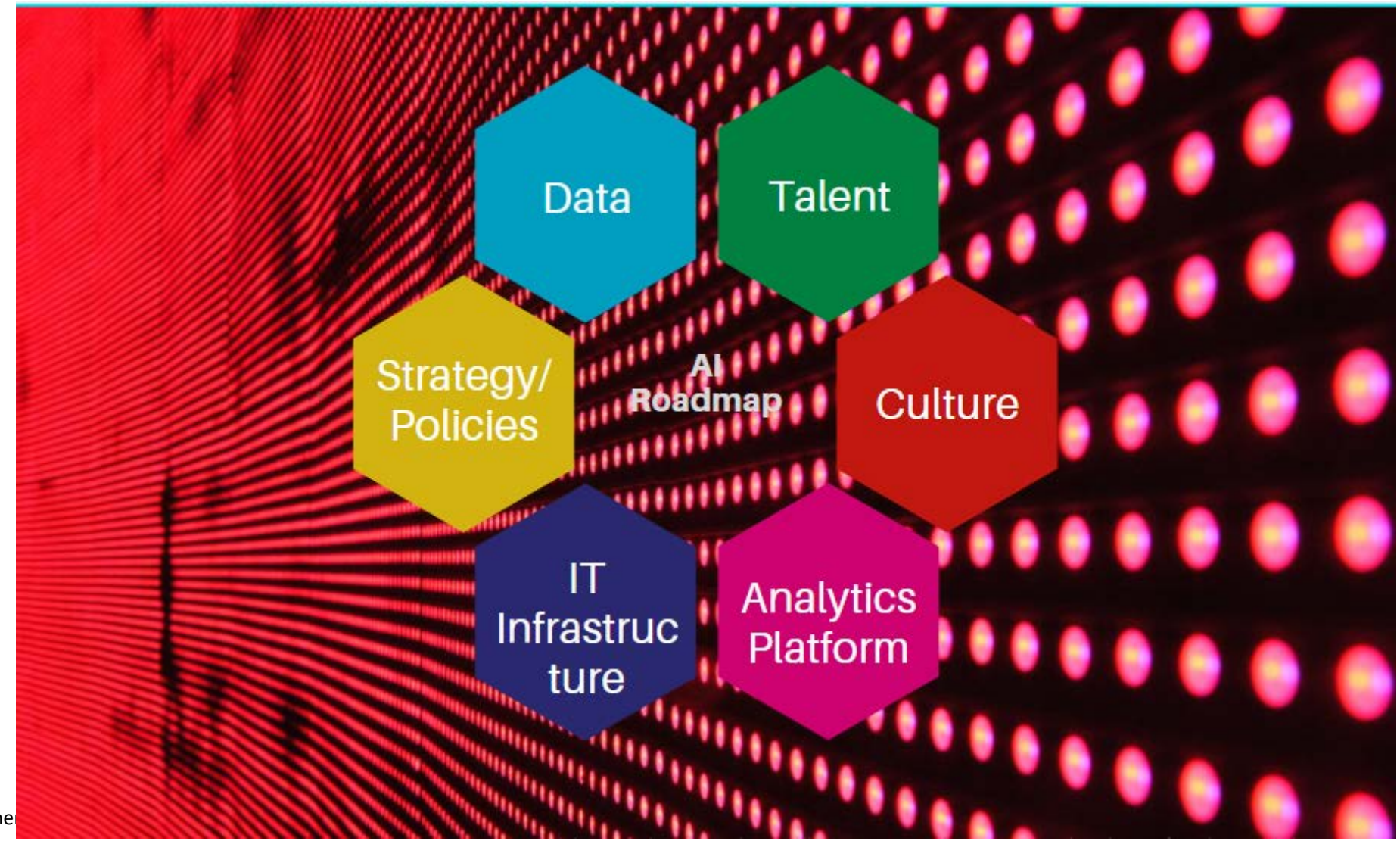
OPM Announces New 'Data Scientist' Job Title

Officials hope that an "unofficial" data science marker for federal jobs could help both with recruitment of new federal workers as well as improve evidence-based policymaking and data management efforts.

Data Science Projects Factors for Failure

- According to Gartner, over 85% of data science projects fail.
- Data Science Factors for Failure include:
  - Solving the Wrong Problem
  - Applying the Wrong Process
  - Siloed Data
  - Shortage of Skills
  - Overlooking Data Culture and Ethics
  - Poor Transparency
  - Deployment and Operationalization

The Golden Hexagon



Time to be BOLD

- Innovate and work towards a better understanding of AI, ensuring its responsible use, and targeting a high level of trustworthiness.
- Develop a roadmap that defines what priorities and impactful actions to take towards ensuring the US leadership in the development and use of trustworthy AI systems in the public and private sectors.
- Democratize AI: How to provide access to data, processing power, and talent across all sectors to share benefits and enhance economic competitiveness?
- Empower everyone with Data and AI Literacy while supporting initiatives to support and promote a diverse AI workforce and advance AI research across the nation.

A Bridge to Success

Government to Government Solutions

Mission: To promote the Commerce Department's and Federal data priorities, including open access and open data, by providing information and data services to the public, industry, and other federal agencies in ways that enable U.S. innovation and economic growth.

The NTIS' approach allows Government entities to focus on the more strategic aspects of their core mission while we deliver:

- Unique, Innovative and Flexible Solutions
- Economies of Scale and Savings
- Operational Efficiencies
- Collaboration and Transparency
- Customer and Quality Service

The NTIS Authority

Joint Venture Partnerships: Authority allows NTIS to enter into JVP agreements with industry to provide new or improved information products or services.

The Authority:

- National Technical Information Act of 1988 (15 U.S.C 3704b)
- NTIS is authorized to enter into joint ventures and share revenue under 15 U.S.C. § 3704b (a)(1)(A)
- NTIS is authorized to receive funds under 15 U.S.C. §§ 1153 and 3704b note.

15 U.S. Code § 3704b. National Technical Information Service

(a) Powers

(1) The Secretary of Commerce, acting through the Director of the National Technical Information Service (hereafter in this section referred to as the "Director") is authorized to do the following:

(A) Enter into such contracts, cooperative agreements, joint ventures, and other transactions, in accordance with all relevant provisions of Federal law applicable to such contracts and agreements, and under reasonable terms and conditions, as may be necessary in the conduct of the business of the National Technical Information Service (hereafter in this section referred to as the "Service").

NTIS Value Proposition

Accelerated Project Setup: NTIS strives to initiate projects quickly through collaboration with the customer and with our established relationship with the Joint Venture Partners (JVP).

Highly Collaborative: NTIS remains closely involved through the lifetime of the project.

Extremely Diverse Skillset Pool: Through the NTIS vetted JVP pool and the ability for them to partner with any other entity, we offer unprecedented access to industry expertise.

Customer ownership: The customer fully drives the Agile project, ensuring that its business needs are accomplished.

Reduced Invoicing burden: NTIS vets work performed, evaluates performer invoicing and requests agency's approval prior to authorizing payment.

Empowering Federal Agencies to Leverage Data as a Strategic Asset

Joint Venture Partner (JVP) Authority

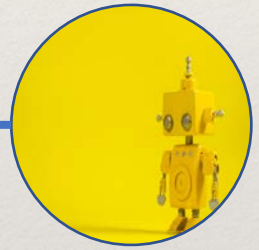
Enterprise Data Platform
Data Governance & Mgt

Data Analytics &
Visualization Solutions

Fraud & Anomaly
Detection

Machine Learning, NLP,
Artificial Intelligence

UNITED STATES DEPARTMENT OF COMMERCE
NTIS
National Technical Information Service



RPA
Augmented Intelligence

Joint Venture Partner (JVP) Initiative

Evidence-Based Decision
Making

Emerging
Technologies

AI for Cybersecurity

UNITED STATES DEPARTMENT OF COMMERCE
NTIS
National Technical Information Service

Data Driven Solutions

Improving quality control of data collection.

Big Data integration platform

Detecting complex fraud patterns

Developing data driven decision-making capability

JAIC - Accelerating DOD's artificial intelligence efforts

Multi Nation / Multi Platform Data integration

Cloud infrastructure, Secure Data Broker and Data Lakes

Predicting potential fraudulent claims

NLP Analytics for parsing of Job announcements.

Assistive Technology & Alternate Format documents

Connecting federal research to the private sector.

Data Transformation and BI solutions

NTIS JVP Partners (currently 43)

1901 Group
Booz | Allen | Hamilton
McKinsey&Company
Grant Thornton
sas
CIVIS ANALYTICS
RTI INTERNATIONAL
United Solutions
ALLWYN
IBM
Hypatia PROJECT
PEGA
BigR.io EMPOWERING DATA
excella CONSULTING
KPMG
ASET PARTNERS SYSTEMS ENGINEERING AND TECHNOLOGY
Deloitte.
ICF INTERNATIONAL
SRI International
ESRI
1QBit

UNITED STATES DEPARTMENT OF COMMERCE NTIS National Technical Information Service

Joint Venture Partners*

Note: NTIS JVP's can partner with other JVP on the list below or with other industry partner, including Academic Institutions that are not on the list.

*** Current list of Joint Venture Partners** : NTIS | NTIS Joint Venture Partners

1	1901 Group	12	Customer Value Partners	23	Jaxon	34	SRI International
2	1Qbit	13	Cybraics	24	KPMG	35	TCG
3	ABSC	14	Deloitte Consulting	25	ManTech	36	The Center for Organizational Excellence
4	ABS Group	15	D&B Government Solutions	26	McKinsey & Company	37	The National Institute for Hometown Security
5	Allwyn Corporation	16	Esri	27	Onai Inc.	38	The Obscidion Group
6	Ampcus, Inc.	17	Excella Consulting	28	Pegasystems	39	Tyler Technologies
7	AMTUSC Quantum Works	18	Grant Thornton Public Sector	29	Proveo Automation	40	UiPath
8	Ardent Management Consulting	19	Hassett & Willis Associates	30	RIVA Solutions	41	Uncharted Software
9	BigR.io	20	Hypatia Project	31	RTI International	42	United Solutions
10	Booz Allen Hamilton	21	IBM Corporation	32	SAIC	43	IPUMS at the University of Minnesota
11	Civis Analytics	22	ICF Incorporated	33	SAS Institute		

The NTIS Process

Ideate

Create 7600 A&B, discuss Current Status, Needs, Challenges & Priorities as well as business needs

Conceptualize

Jointly Develop Problem Statement (PS), whiteboarding, create opportunity announcement

Propose

Receive & Evaluate Technical (written and oral presentation) & Financial Proposals

Implement

Select Partner(s) and Kick off project(s)

Secret Sauce: The Whiteboarding Session

- Meeting with all interested JVPs
  - In-Person
  - Via video conferencing
- Agency explains Data Mission and general requirements
- JV Partners poses questions and comments: “what about…”, “have you considered….”, “timeline….”, “MVP…”
- Allows for better understanding by JVPs <u>thereby providing more targeted proposals</u>

NTIS Framework Summary

- Easy access to solutions – **collaboration** reduces the time to start
- **Fed-to-Fed** services allow for transparent communication and exchange of ideas
- Wide range of industry expertise from a **diverse group of partners** to include industry and academia
- **NTIS manages JVP relationship** and ensures customer satisfaction – your agreement is with NTIS
- Agile deployment allows the ability to test different strategies to achieve the optimal solution with **potentially no paperwork/ change of specifications**
- High satisfaction rate as demonstrated by the **repeat customers**
- Reduced **invoicing burden**

- **Mission**: The mission of the JAIC is to transform the DoD by accelerating the delivery and adoption of AI to achieve mission impact at scale.
- JAIC has now been integrated into the Department of Defense's Chief Digital and Artificial Intelligence Office (CDAO), which is responsible for the acceleration of the DoD's adoption of data, analytics, and AI to generate decision advantage across, from the boardroom to the battlefield.

- **Objectives:** Business Transformation Intelligence, Augmented Cybersecurity, Strategic Advantage, Disaster Support.
- **Problem**: "Our adversaries in cyberspace are automating their attacks." The U.S. Defense Department needs to develop the capability to more quickly detect cyber intrusions and enable a more rapid response.
- **Solution:** Increase the use of Automation and Machine Learning tools to monitor the data sources to make informed decisions, identify efficiencies for early detection, accuracy of detection, and timely mitigation, if not prevention of threats.

Cybersecurity Challenges

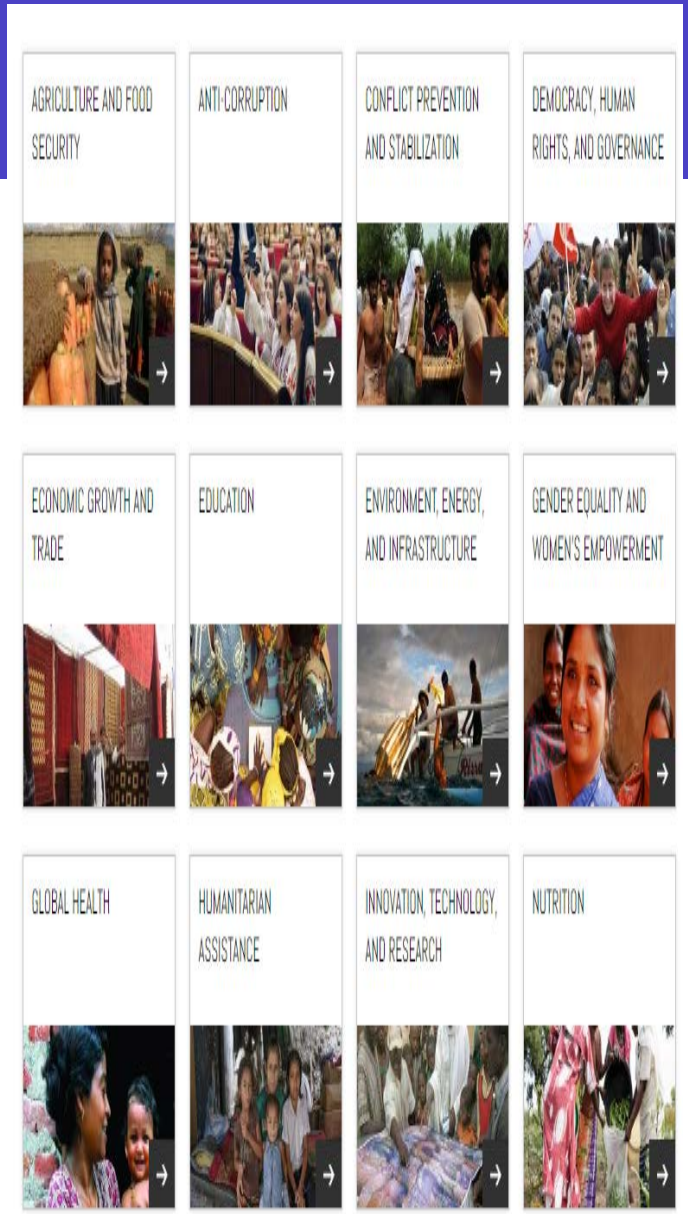
- The enterprise attack surface is massive and continuing to grow and evolve rapidly. The global cybersecurity threat landscape is changing, and internet users now face ever-evolving threats to their data and privacy.
- Hundreds of attack vectors
- Big shortfalls in the number of skilled security professionals
- Masses of data that have moved beyond a human-scale problem
- There are massive, largely automated botnets infecting consumer devices and social engineering or phishing attacks that try to fool users into giving away their money and data.
- Artificial intelligence is now the latest weapon in the cyber security armory.

Prevent Network Penetration

- SEARCH-T, a novel information retrieval system that ingests cyber log data and uses tensor decomposition.
- Rather than applying machine learning methods to the detection of new threats, we have used unsupervised methods to accelerate investigations, and more effectively use the tools cyber experts have at their disposal.
- 60 days of network log activity/4 million IPs/Identify one additional IP from a malicious actor from an original 6 that were manually flagged.

USAID

- **Mission**: The U.S. Agency for International Development leads the U.S. Government's international development and disaster assistance through partnerships and investments that save lives, reduce poverty, strengthen democratic governance, and help people emerge from humanitarian crises and progress beyond assistance.
- USAID transforms. It transforms families, communities, and countries – so they can thrive and prosper. Whether by preventing the next global epidemic, responding to a devastating earthquake, or helping a farmer access tools to grow her business.



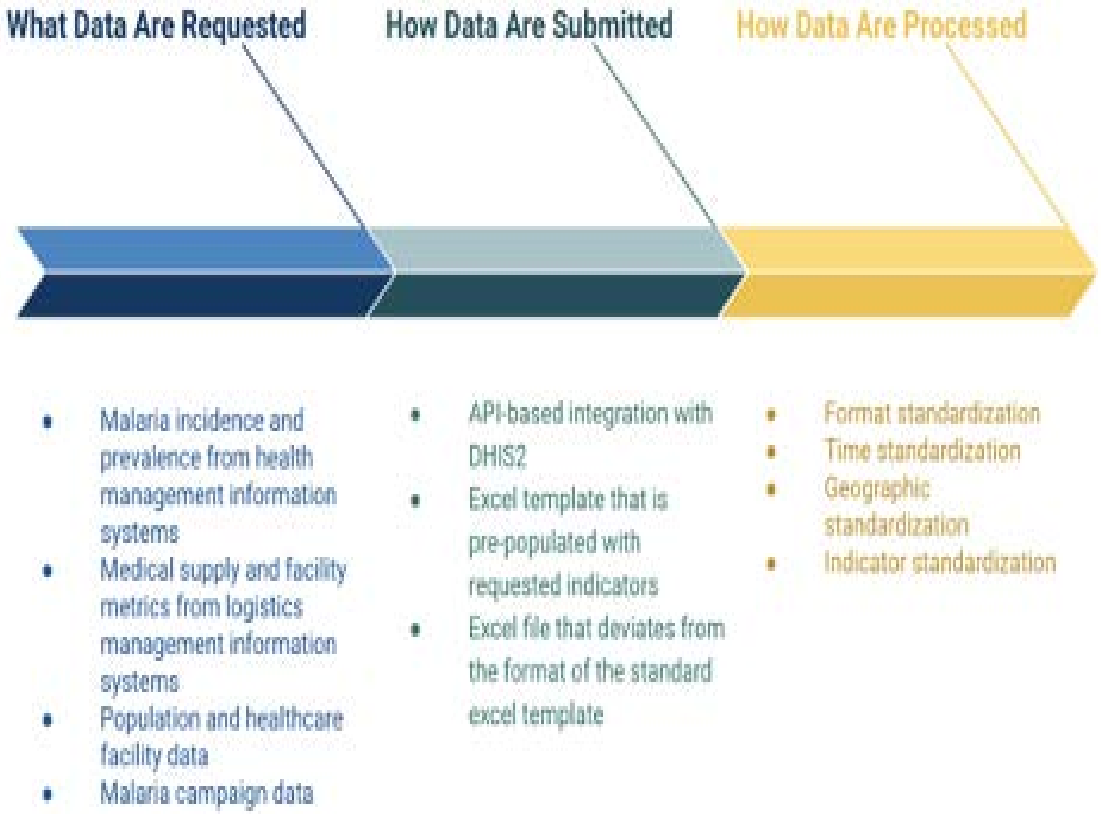
Malaria

- Malaria is one of the world's oldest and deadliest diseases.
- Eliminated in the United States in the early 1950s, malaria remains a major global health security and economic threat—nearly half of the world's population is still at risk.
- Malaria parasites are spread by infected female Anopheles mosquitoes when they bite.
- Early symptoms, such as fever, headache, and chills, may be mild and difficult to recognize. If not treated, malaria can rapidly progress to severe illness and death.
- The World Health Organization estimated that there were about 241 million malaria cases and 627,000 deaths worldwide in 2020.

USAID PMI

- The U.S. President's Malaria Initiative (PMI) supports 24 partner countries in sub-Saharan Africa and three programs in the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria.
- PMI delivers cost-effective, life-saving malaria interventions—such as insecticide-treated bed nets, indoor residual spraying, and essential medicines—alongside catalytic technical and operational assistance to equip and empower partner countries to end malaria. PMI is a multi-agency initiative, led by USAID and co-implemented with the U.S. Centers for Disease Control and Prevention (CDC) within the U.S. Department of Health and Human Services (HHS).

M-DIVE



NTIS: Public-Private Partnership to Accelerate Data Innovation and AI Adoption in Government

The U.S. Government, through PMI and the U.S. contribution to the Global Fund, played a leading role in helping partner countries and saving lives.

In FY 2021 PMI benefited **700 million people**

Together with our partners, PMI has helped **save 10.6 million lives and prevent 1.7 billion malaria infections** worldwide since 2000

PMI DELIVERED:

45.7m mosquito nets (ITNs)
TO PROTECT: **91.4m** people

Insecticide to spray **5.8m** homes (IRS)
TO PROTECT: **21.2m** people

34m seasonal preventive treatments (SMC)
TO PROTECT: **8.4m** children

155.3m rapid diagnostic tests (RDTs)
TO PROTECT: **155.3m** people

16.2m preventive treatments in pregnancy (IPTp)
TO PROTECT: **5.4m** women

113.6m malaria medicines (ACTs)
TO PROTECT: **113.6m** people

Since 2006, in countries where PMI works, global efforts have supported:

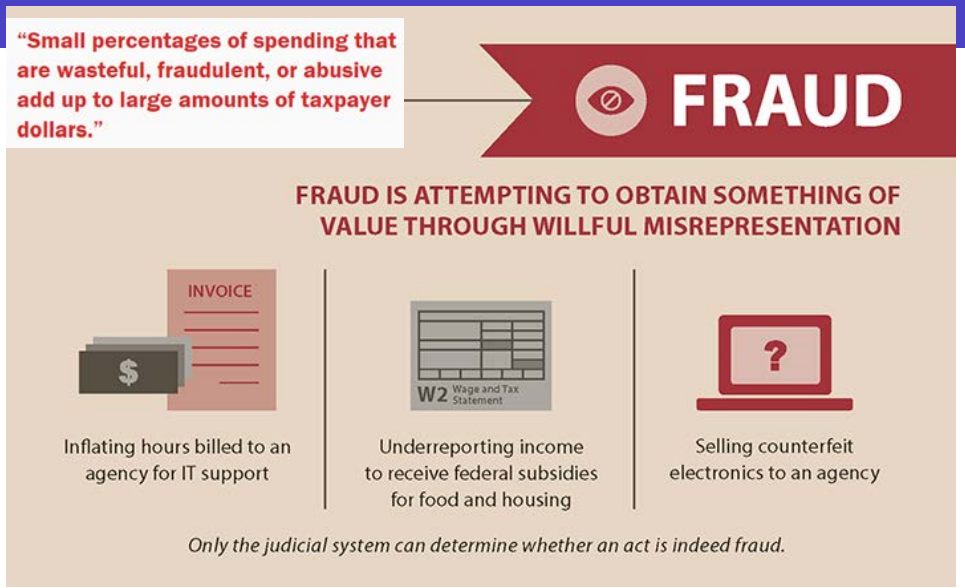
↓43%
AVERAGE DECREASE IN CHILD DEATH RATE FROM ALL CAUSES[i]

↓26%
DECLINE IN MALARIA CASE RATES[ii]

↓42.7%
DECLINE IN MALARIA DEATH RATES[ii]

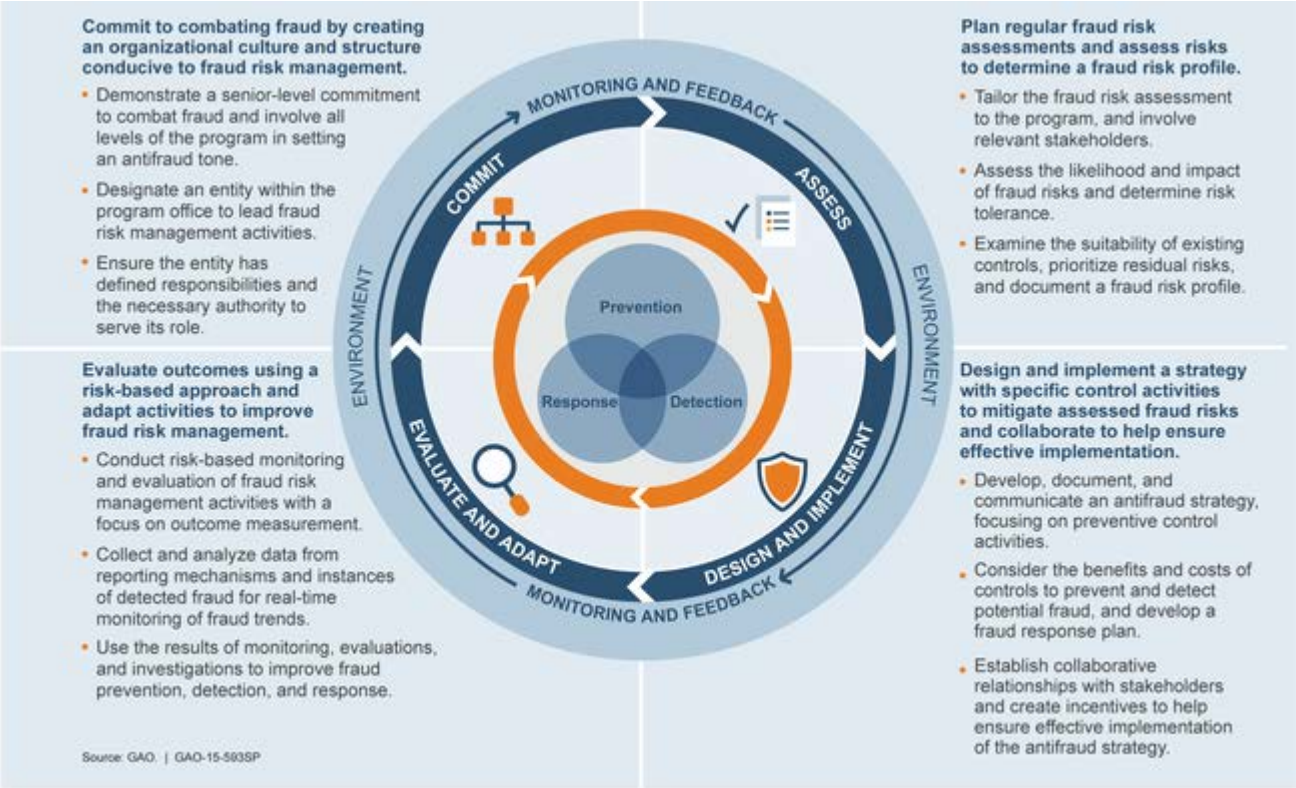
Fraud, Waste, and Abuse (FWA)

One of the 2019 Payment Integrity Information Act is “reducing government-wide improper payments, including fraud”



JULY 22, 2015

NEW GAO REPORT FINDS SERIOUS VULNERABILITIES TO WASTE AND FRAUD WITH MEDICARE PROVIDER LIST



Federal agencies made an estimated $281 billion in improper payments in FY 2021—up from about $206 billion for FY 2020. This estimate is likely understated since it doesn’t include improper payments related to COVID-19 funding (UI, SBAPP). In fact, cumulative federal improper payment estimates have totaled about $2.2 trillion since FY 2003.

Machine Learning for Fraud Detection

- Traditionally fraud detection algorithms use rules-based approaches that must keep expanding as fraud evolves and result in a high number of false positives. ➔ Inefficient and Hard to Scale
- Machine Learning algorithms are faster, scalable, adaptable, and more accurate. They are more effective than humans at uncovering non-intuitive patterns or subtle trends. ➔ Scalable and more Effective

Rules and machine learning are complementary tools for fraud detection

Combating Health Care Fraud, Waste, and Abuse

- HHS has over a trillion-dollar portfolio. HHS OIG's multi-disciplinary, geographically dispersed team needs to have "data at their fingertips," meaning they need to easily and rapidly access and analyze data to identify and target potential fraud schemes and areas of program waste and abuse.
- How can HHS-OIG use data even more to accelerate that process? How to empower staff to use data proactively?
- Cloud-based platform with an enterprise dashboard and analytics capabilities to enable staff to identify emerging issues through data and automated risk assessments, and then effectively prioritize the activities of oversight and enforcement resources.

Department of Labor - OCIO

- **Mission**: To foster, promote, and develop the welfare of the wage earners, job seekers, and retirees of the United States; improve working conditions; advance opportunities for profitable employment; and assure work-related benefits and rights.
- The Department of Labor administers federal labor laws to guarantee workers' rights to fair, safe, and healthy working conditions, including minimum hourly wage and overtime pay, protection against employment discrimination, and unemployment insurance.

DOL – OCIO EDP

Enterprise Data Platform

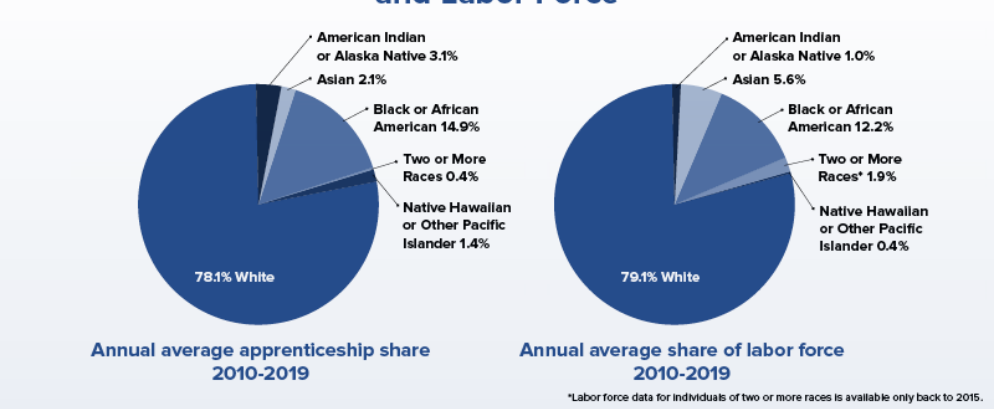
DOL's Office of the Chief Information Officer

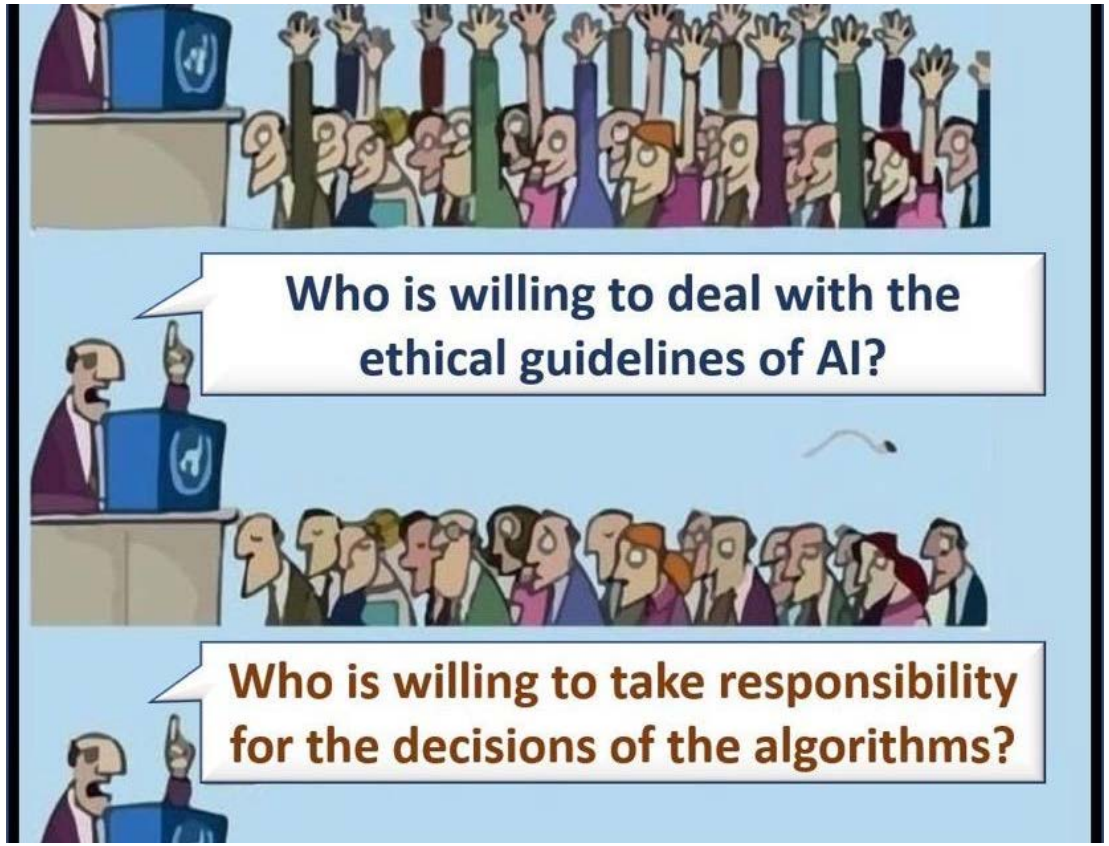
Outcome: Developed a big data-integration system, integrating 15 legacy data-centric system applications.

Apprenticeships

- Registered Apprenticeship is an industry-driven, high-quality career pathway where employers can develop and prepare their future workforce, and individuals can obtain paid work experience, receive progressive wage increases, classroom instruction, and a portable, nationally-recognized credential.

Figure 2: Comparison of Apprenticeship Distribution and Labor Force

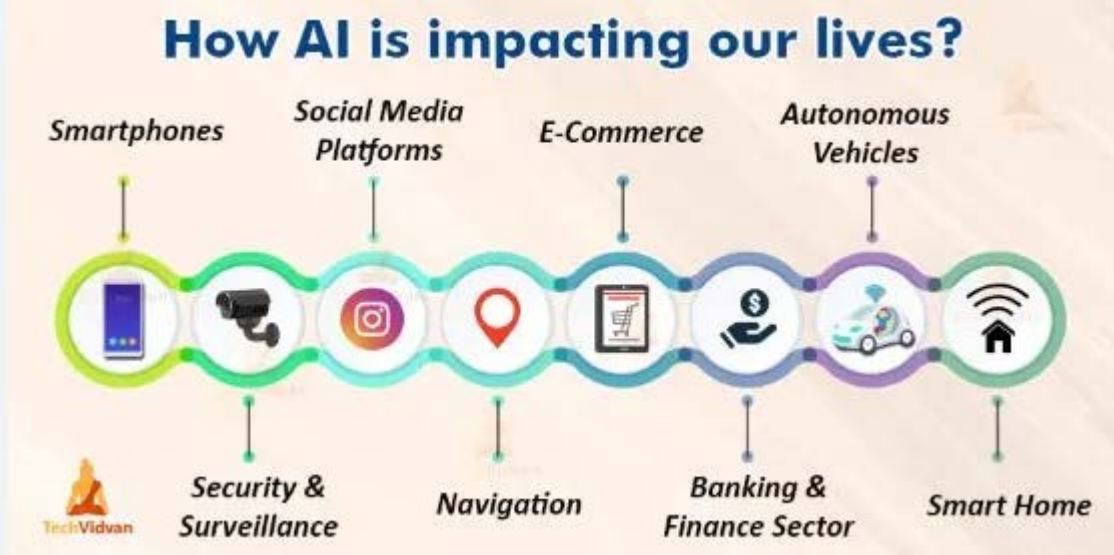




- Trustworthy AI is valid and reliable, safe, fair and where bias is managed, secure and resilient, accountable and transparent, explainable and interpretable, and privacy-enhanced.
- AI systems are socio-technical in nature, meaning they are a product of the complex human, organizational, and technical factors involved in their design, development, and use.

Trustworthy AI

AI is Everywhere



APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN MILITARY

The main applications of artificial intelligence are as follows, and they will advance in the upcoming years:

- Cybersecurity
- Warfare systems
- Logistics and transport
- Target recognition
- Warfare healthcare
- Threat monitoring & situational awareness
- AI & data information processing
- Combat simulation & training

Bias in hiring: 5 key terms

Automated hiring software is subject to regulations administered by the U.S. Equal Employment Opportunity Commission.

Adverse (disparate) impact
"A substantially different rate of selection in hiring, promotion or other employment decision which works to the disadvantage of members of a race, sex or ethnic group."
The discrimination can be unintentional. Replacing *impact* with *treatment* means it was intentional. *Adverse* is synonymous with *disparate* and both are commonly used.

Facially neutral
An employment practice that doesn't appear to be discriminatory but nonetheless has adverse impact on a protected class.

Four-fifths rule
The rule of thumb quantifying adverse impact as a selection rate for one group that is less than four-fifths (80%) of the group with the highest rate. Hiring tools have algorithms for calculating the ratios.

Protected class
The EEOC lists nine categories of groups protected from discrimination: race, color, religion, sex, age, national origin, disability, genetic information and victims of retaliation for complaints or legal action.

Uniform Guidelines on Employee Selection Procedures
EEOC guidance to help employers comply with anti-discrimination laws. It defines adverse impact, the four-fifths rule and defenses against violations, such as showing that an employment decision was "job related" or motivated by "business necessity."

NTIS: Public-Private Partnership t and AI Adoption in Government

DOC-NIST AI RMF

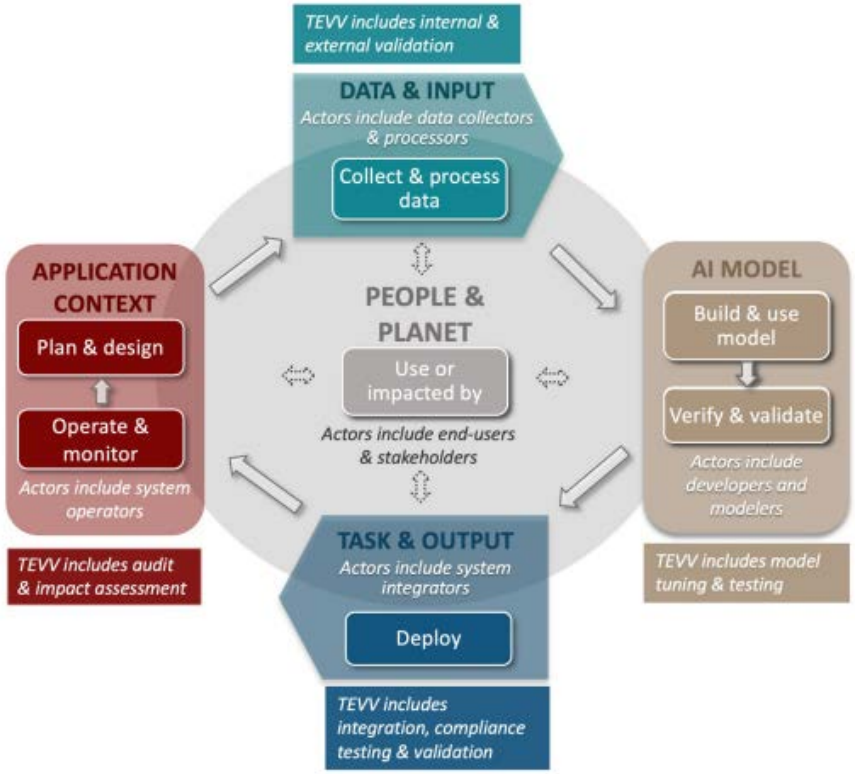


Figure 1: Lifecycle and Key Dimensions of an AI System. Modified from OECD (2022) OECD

- Valid & Reliable / Safe / Fair / Secure & Resilient / Transparent and Accountable / Explainable and Interpretable / Privacy-Enhanced

Lifecycle	Activities	Representative Actors
Plan & design	Articulate and document the system's concept and objectives, underlying assumptions, context and requirements.	System operators, end-users, domain experts, AI designers, impact assessors, TEVV experts, product managers, compliance experts, auditors, governance experts, organizational management, end-users, affected individuals/communities, evaluators.
Collect & process data	Data collection & Processing: gather, validate, and clean data and document the metadata and characteristics of the dataset.	Data scientists, domain experts, socio-cultural analysts, human factors experts, data engineers, data providers, TEVV experts.
Build & use model	Create or select, train models or algorithms.	Modelers, model engineers, data scientists, developers, and domain experts. With consultation of socio-cultural analysts familiar with the application context, TEVV experts.
Verify & validate	Verify & validate, calibrate, and interpret model output.	
Deploy	Pilot, check compatibility with legacy systems, verify regulatory compliance, manage organizational change, and evaluate user experience.	System integrators, developers, systems/software engineers, domain experts, procurement experts, third-party suppliers with consultation of human factors experts, socio-cultural analysts, and governance experts, TEVV experts, end-users.
Operate & monitor	Operate the AI system and continuously assess its recommendations and impacts (both intended and unintended) in light of objectives and ethical considerations.	System operators, end-users, domain experts, AI designers, impact assessors, TEVV experts, product managers, compliance experts, auditors, governance experts, organizational management, end-users, affected individuals/communities, evaluators.
Use or impacted by	Use system/technology; monitor & assess impacts; seek mitigation of impacts, advocate for rights.	End-users, affected individuals/communities, general public; policy makers, standards organizations, trade associations, advocacy groups, environmental groups, civil society organizations, researchers.

Figure 2: AI actors across the AI lifecycle.

NTIS: Public-Private Partnership to Accelerate Data Innovation and AI Adoption in Government

DOC – Data Ethics Framework

DRAFT

Privacy and Confidentiality

Establish measures to protect privacy and confidentiality.

Apply responsible data stewardship throughout the data lifecycle.

Fairness and Inclusiveness

Ensure collected data are fair and complete and representative of all audiences.

Mitigate/Remove unintended bias from data and data processing.

Adopt best practices to ensure inclusiveness.

Democratize data practice and data-driven impact monitoring.

Transparency and Accountability

Exercise transparency throughout the data lifecycle.

Use data to increase accountability.

Establish responsibilities and facilitate oversight.

Foster a culture of responsible data practices.

Safety and Security

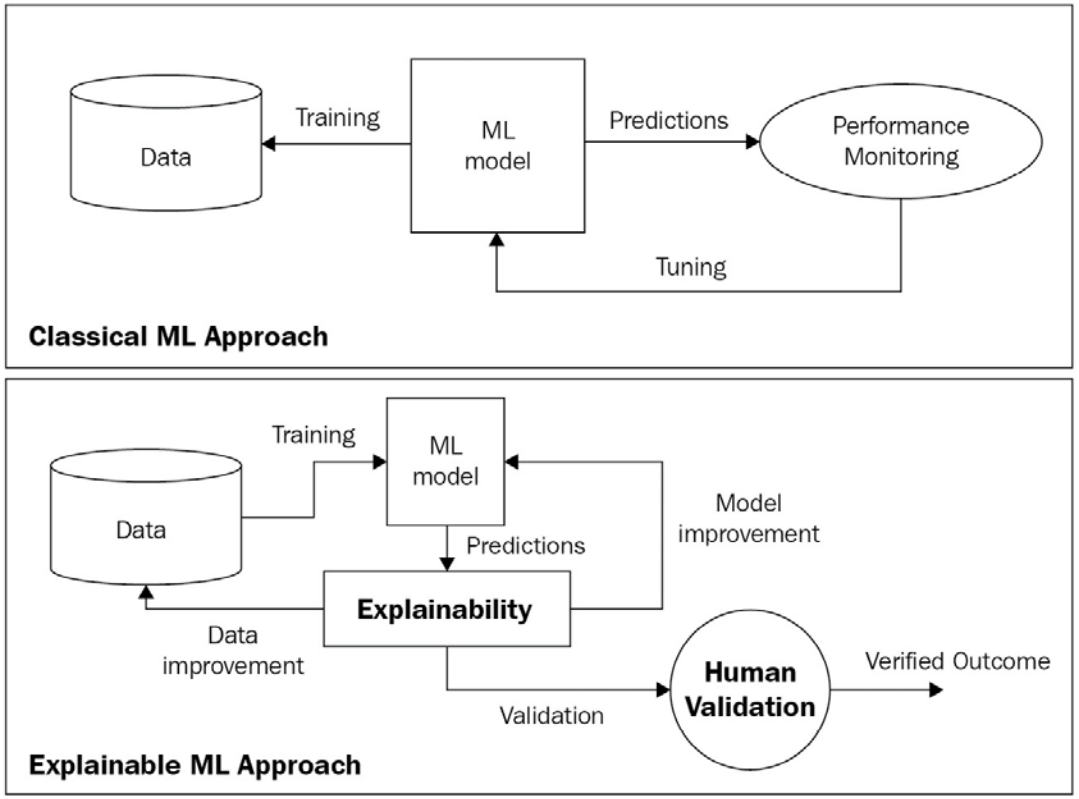
Protect data from unauthorized access and malicious impact.

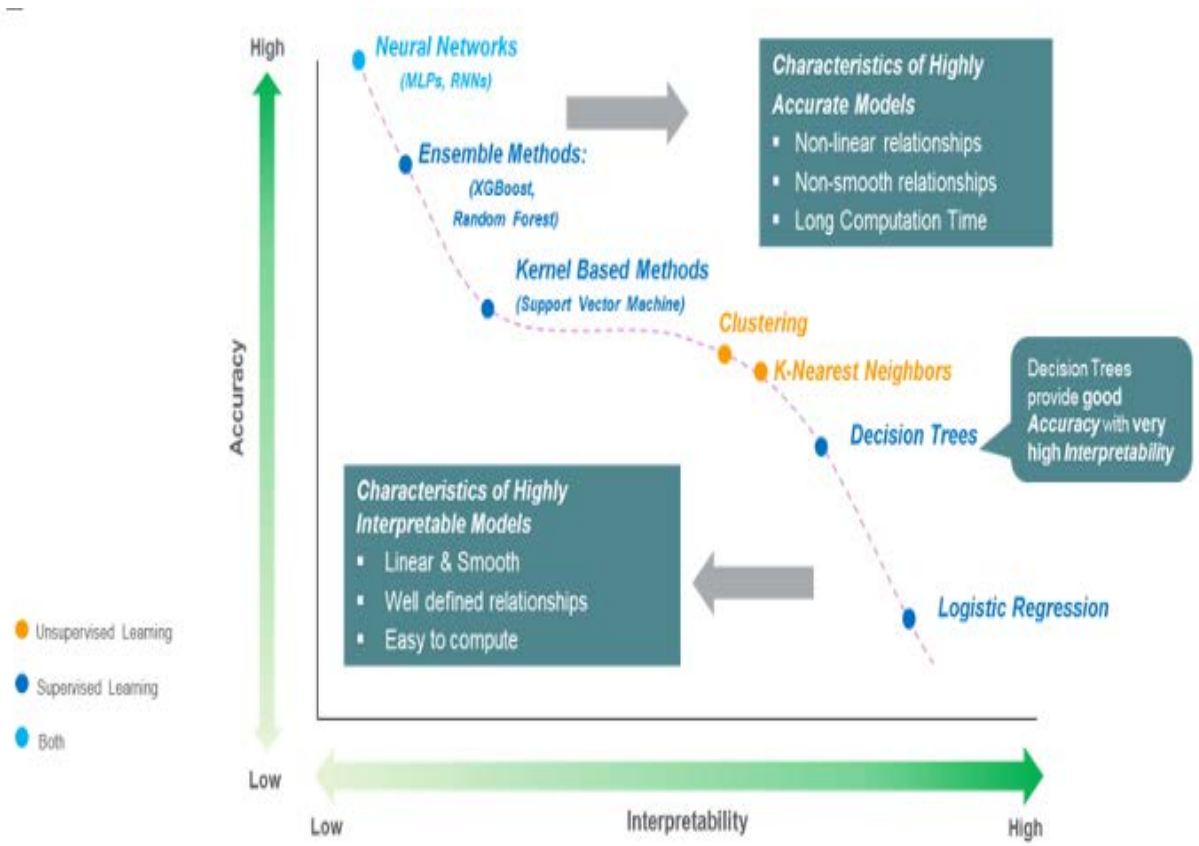
Develop standards and best practices to prevent or mitigate data loss.

Develop a risk management plan and implement data safety and security measures.

XAI: Explainable AI

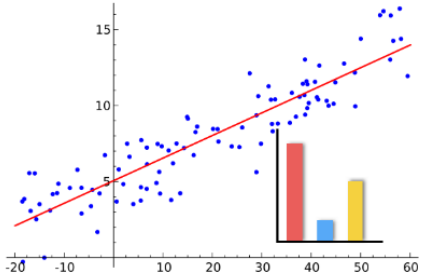
- XAI is a critical practice to ensure that AI and ML solutions are transparent, trustworthy, responsible, and ethical.

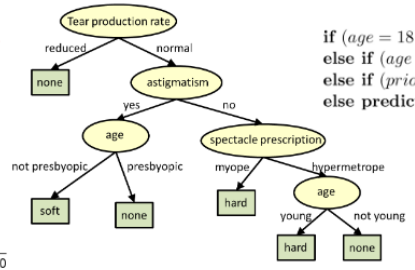




Possible Approaches towards XAI

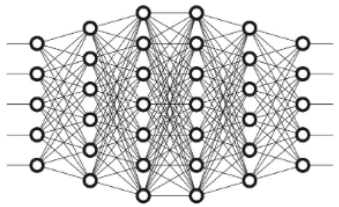
- Build inherently interpretable prediction models

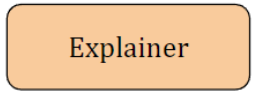


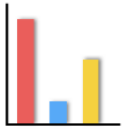


if $(age = 18 - 20)$ **and** $(sex = male)$ **then predict** yes
else if $(age = 21 - 23)$ **and** $(priors = 2 - 3)$ **then predict** yes
else if $(priors > 3)$ **then predict** yes
else predict no

- Explain pre-Built Models in a post-hoc manner







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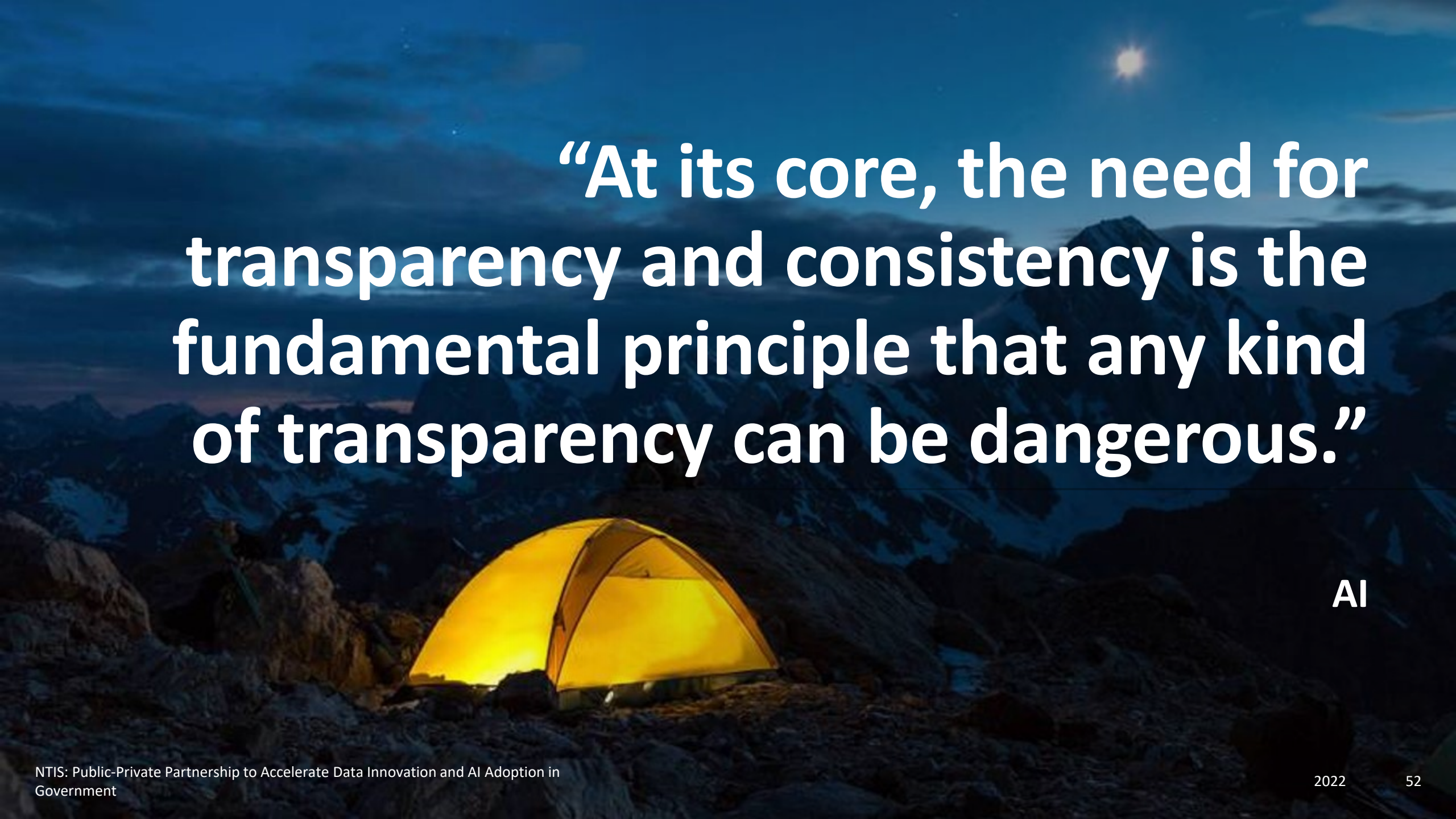
Summary

- The U.S. government has a huge opportunity to capitalize on data, AI, and other emerging technologies to drive innovation to achieve mission outcomes and deliver at scale and market speed.
- Agencies will be empowered to provide:
  - A better and more personalized experience for citizens,
  - Optimize processes
  - Reduce time on basic tasks to focus on evidence-based decision making and innovative ways to improve services.
- The NTIS framework provides a unique framework to achieve these objectives in a rapid, efficient, and effective way.



“At its core, the need for transparency and consistency is the fundamental principle that any kind of transparency can be dangerous.”

AI

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Thank you / Any Questions?