INFORMATION TECHNOLOGY
Vendor Management Office

Leading Edge Technologies Market Report

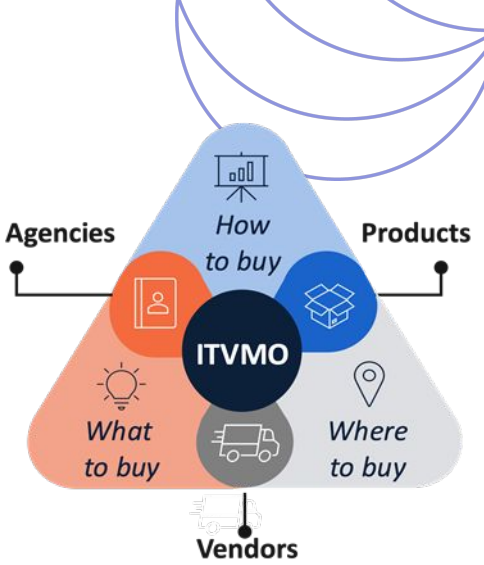
April 2023

Report Contents

Overview of Report

ITVMO Technology Portfolio Objectives

Aim to identify, categorize and optimize information technology products and services in the public sector.	Advisory services that help to more efficiently adopt modern technologies, emerging business solutions, and cost-cutting measures.	Strengthen government-wide interoperability and collaboration across agencies can promote better long-term technology planning.	Collaborate with other governmental groups to enhance the accessibility and availability of the procurement data for agencies.



Market Report Purpose

This report presents an overview of innovative technology sectors in this report, to evoke conversations and the sharing of data amongst federal IT purchasers. The report distinguishes forthcoming technology and procurement trends that could affect agencies' IT strategies after 2023. The ITVMO seek feedback from agencies concerning these trends, to help deliver the objectives noted above.. If you have feedback, questions, or comments, please send those to the IT Vendor Management Office (ITVMO) at ITVMO@gsa.gov.

Vendor Criteria

Vendors were sourced from a variety of datasets including: **GSA E-Library, Gartner, Govwin, and USFCR** among others. Vendors include a combination of large contract holders and emerging small businesses.

FY23 Leading Edge Technologies

This report investigates the difficulties, prospects, and suppliers concerning the following Areas of Focus:

- Artificial Intelligence (AI)
- Blockchain
- Computer Vision (CV)
- Cloud Computing
- Cybersecurity
- Machine Learning (ML)
- Robotic Process Automation (RPA)
- 6G

New in FY 23

Artificial Intelligence

Artificial Intelligence Overview

Artificial Intelligence (AI) is a comprehensive term which denotes any automated system able to execute activities with fluctuations and malleability in conditions, not requiring heavy human involvement, or able to acquire knowledge from data and advance its efficiency. When used in computing applications, AI enables achieving goals through perception, decision making, planning, communication, reasoning, learning and action.

Deltek's AI Key Findings

50% Spending Increase

There has been a **50% increase** in federal expenditure on artificial intelligence, from FY18 to FY20, making it one of the fastest growing emerging technology investment sectors.

177% Increase in Small Businesses

Over the two fiscal years, FY18 to FY20, small business financial commitments involving AI rose 177% from $129 million to $357 million.

New Legislation and Policy

Taking into account the need for the U.S. to be competitive in AI a government-wide initiative was formulated to stimulate the implementation of AI capabilities..

AI Government Use Cases

There are several ongoing initiatives and communities focused on sharing best practices related to Artificial Intelligence in the federal government. AI is still in its infancy and presents numerous challenges and risks as the industry continues to mature.

Relevant Government Use Cases	Description and Use Case
National Artificial Intelligence Research Resource Task Force	The AI Bill of Rights is a set of five principles and practices formulated to guide the design, use, and deployment of automated systems with the purpose of safeguarding the rights of the American public in an era with advancing artificial intelligence technology. After extensive consultation with members of the public, these principles are designed to build and deploy automated systems that support democratic values and shield civil rights, civil liberties, and privacy.
US proposes guidelines for responsible AI use by military	The purpose of this declaration is to facilitate international cooperation regarding the incorporation of Artificial Intelligence (AI) and autonomy into military operations in order to guarantee that the deployment and use of these technologies maintains respect for international law, and promotes security and stability.
AI Poses Great Risks but Safe Integration Will Yield Positive Results	Given the prevalence of Artificial Intelligence in our daily lives and its significance as one of the great technological breakthroughs of our time, we must exercise heightened accountability when employing its capabilities. It is imperative that the United States takes on a leading role in utilizing and employing artificial intelligence technology to combat potential foreign threats posed by artificial intelligence-based adversaries.

AI Vendors and Products

This list provided by the ITVMO seeks to increase awareness of some AI solutions within the federal government, but does not aim to be comprehensive or act as an endorsement of any particular vendor or product. It may serve as a guide for agencies seeking to identify efficient solutions that meet their mission objectives.

- Amazon AWS AI Services:
  - Polly – text-to-speech
  - Transcribe – speech-to-text
  - SageMaker – managed service allowing developers and data scientists to build, train, and deploy machine learning models
  - Lex – conversational AI for chatbots
  - Rekognition – image and video analysis
  - Comprehend – natural language processing
  - Translate – language translation
- Pega Platform
- Pachyderm
- Idiomatic
- Forethought
- Microsoft AI Platform
- Google Vertex AI
- **Open AI**
- **DevIQ**
- **Okaya USA**
- **AlphaBOLD**
- **Synopsys**

Bold = New in FY23

AI Trends

As AI develops further, it will be increasingly integrated with other essential and rising technologies such as Cybersecurity, Robotic Process Automation (RPA), Network Performance Management, Data Wrangling and works related to Big Data and Advanced Analytics. Moreover, AI platforms are enabling low-code and no-code development whilst cutting-edge solutions in the field of Cybersecurity and RPA amongst others in corporate inbuilt AI features.

FY 2023 Trends in Government

The majority of federal expenditure is concentrated on research and development, but AI-RPA technology is quickly transforming from theoretical to operational settings within the federal government, including:

Big Data Visualization	Cloud Infrastructure Optimization	Digital Twins	Fraud Detection	Internet of Things (IOT)
Large Language Models	Natural Language Processing	No Code Tooling	Predictive Analytics and Forecasting	Workflow and Process Automation

New in FY 23

Blockchain

Blockchain Overview

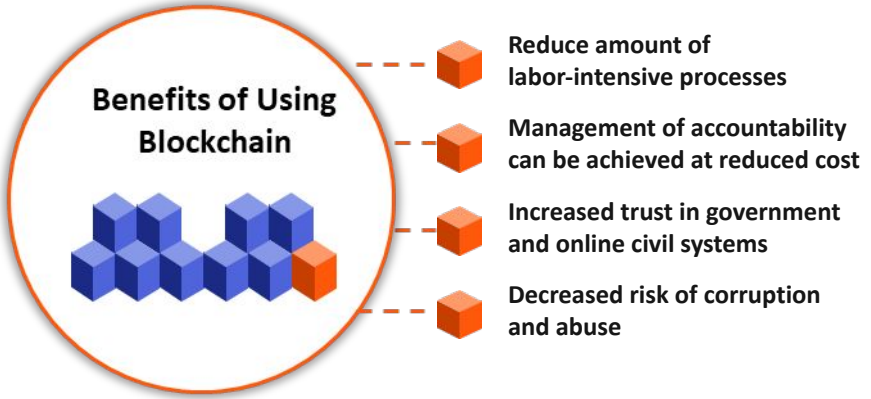
Blockchain is a type of digital distributed ledger using cryptography to provide an irrevocable record of transactions to users across a network. Since the onset of the pandemic, investments in blockchain technology have taken a backseat as organizations concentrated on issues pertaining to business continuity, remote and hybrid work, cybersecurity, and digital transformation. However, with the emergence from the pandemic's effects, there is renewed interest in blockchain applications such as those related to medical supply chains, healthcare surveillance and procurement optimization.

Recommendations

- **Be prudent.** *As implementation of projects proceeds, general use cases may transform and new technologies may develop suddenly causing deviation from initial plans.*
- **Aim High.** *Compare and contrast your agency's preparedness with other agencies by evaluating the government use cases.*
- **Stay current.** *Establish a regular protocol to be informed of the current advances in technology.*

Key Questions

- Is a business network involved?
- Is consensus used to validate transactions?
- Is an audit trail required?
- Must the record of transactions be immutable and tamper-proof?
- Should dispute resolution be final?



Blockchain Government Use Cases

There are several ongoing initiatives and programs focused on blockchain in the federal government.

Relevant Government Use Cases	Description and Use Case
Executive Order on Ensuring Responsible Development of Digital Assets	The unprecedented growth in markets for digital assets and the development of Digital and Distributed Ledger Technology for financial services has had a considerable impact on consumer, investor, and business protection. This includes an effect on data privacy and security; systemic risk; criminal activity threats; national security; exercise of human rights; financial inclusion and equity; as well as energy demand and climate change. In November 2021, non-state issued digital assets expanded to a market capitalization of $3 trillion, up from the value at approximately $14 billion from early November 2016. Furthermore, central bank digital currencies (CBDCs) are also being evaluated globally with some cases having already been introduced.
Smart Cities	By implementing information technology, data integration and management of physical, social and business infrastructures, governments can explore innovative services and solutions to provide for their citizens. Ethereum blockchain based technologies can provide the mechanism needed for a secure interoperable infrastructure to support these smart cities, as well as allowing for improved services beyond the levels that are currently in operation.
Tracking Student Loans and Grants	Smart contracts can be programmed to automate the management of loan and grant applications, distributing loans and tracking conformity with the terms and stipulations. This automated performance tracking affords real-time data access whilst enhancing transparency, adherence to criteria, and security.

Blockchain Vendors and Products

The ITVMO has created a list of suppliers and services connected to Blockchain in government which may be useful for agencies looking for suitable suppliers and services for their mission requirements. It is important to observe that this list is not comprehensive and should not be taken as an endorsement of any specific supplier or service.

- AION Blockchain
- Amazon Quantum Ledger Database
- Azure Blockchain Workbench
- BigChainDB Platform
- Chain Sequence Blockchain
- Corda Platform
- HydraChain Platform
- IBM Blockchain platform
- Lisk Platform
- NEO Platform
- Oracle Autonomous Blockchain Cloud Service
- POA Blockchain Platform
- Salesforce Blockchain
- SAP Leonardo
- Stratis
- WAVES Blockchain Platform

Computer Vision (New in FY23)

Computer Vision Overview

Computer vision is a branch of artificial intelligence that enables machines to analyze, interpret and understand visual data from the world around them. Its applications are vast and diverse. Combining AI and machine learning technology with computer vision capabilities, enterprises across the globe have been enabled to make remarkable progress in their security and operational systems. Although the use of computer vision remains in its early stages at Federal government level, potentials are great.

Key Trends in 2023

Office managers can utilize video footage to accurately evaluate compliance with coronavirus pandemic protocols related to social distancing amongst federal employees. Physicians can enhance their decision making process based on insights gathered from imagery that has been automatically processed and analyzed with the help of computers.

Additionally, government infrastructures can also be rapidly evaluated for structural weaknesses through the use of drone footage. Through scene intelligence, a computer vision system can alert users to any discrepancies taking place in a given location during a certain time. For instance, an airport surveillance camera could detect if a passenger is exhibiting strange behavior such as an unusual gait - which could signify they are carrying some form of weapon that might not be distinguishable to the layperson.

What can Computer Vision do for your agency?

- **Security and Surveillance**
- **Environmental Monitoring**
- **Transportation**
- **Healthcare**

Computer Vision Government Use Cases

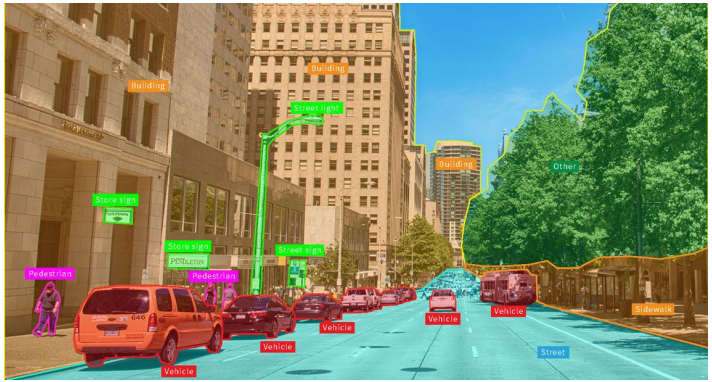
The federal government has multiple ongoing initiatives and programs dedicated to the application of Computer Vision.

Relevant Government Use Cases	Description and Use Case
Computer Vision Can Solve a Host of Practical Problems in Government, Experts Say	Computer Vision (CV) is aiding multiple Federal agencies including DOT and the IRS in achieving their operations and tasks today, such as the processing of documents, mail scanning for nutritional fact panels, measuring axial stress in railroads, automatically decoding license plates and detecting pulses. AI and machine learning coupled with CV enable organizations to experience great strides in security and operational performances. Though the application for CV within the Federal government is still developing, there is vast potential. Agencies require staff with expertise in tagging data, providing it for training algorithms, and training models. Some possess this competency whereas others have yet to develop it.
How Computer Vision will Help Government See Further	The GSA is highly interested in this due to its responsibility of over 9,600 buildings owned or leased. Together with the Federal Protective Service, the well-being and security of over one million tenants and visitors daily must be ensured. Adding computer vision to an existing security-camera infrastructure could potentially improve both physical security and facility operations.
Can Artificial Intelligence 'See' More Responsibly	The Networking and Information Technology Research and Development Program, a federally-funded organization dedicated to advanced information technology solutions, has issued an updated guidance on federal computer vision and AI technology research that is open to public comment. This Federal Video and Image Analytics Research and Development Action Plan seeks suggestions that can improve its key pillars in order to bridge noted gaps in federal research investment with regards to responsible AI.

Computer Vision Suppliers and Products

The ITVMO has created a list of vendors and products related to the Computer Vision industry, for the purpose of aiding agencies in identifying a suitable vendor and product that can better serve their mission requirements. This list is provided as an initial reference point, and should not be considered as an exhaustive list or a recommendation for any specific vendor or product.

- ScienceSoft USA Corporation
- ISRA Vision
- Datronics
- Predator Software
- Omron Automation Americas
- Azure Network Watcher
- QxSoft
- Veritone
- MORSE Corp
- AMP Robotics
- Covariant
- Carbon Robotics
- ManageEngine OpManager Plus and Netflow Analyzer
- Arturo
- Apptronik
- Wyze



Cloud Computing

Cloud Computing Overview

The ingestion of cloud services offers accelerated innovation, increased access to resources, and economies of scale. Generally, customers will only be charged for the services they consume, aiding in cost reduction and providing an optimized use of their infrastructure that can fluctuate as required. In regards to cloud services, four types exist-- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS) ,and Serverless.

Edge Computing	Serverless Computing	Kubernetes	AI in the Cloud	Internet of Things
• Emerging cloud trend that involves constructing localized data centers in or close to the area where data is acquired, instead of in a centralized location. • Advantages of this system are: increased processing speed, low latency, strong connectivity, high security levels, and reduced data transmission volumes.	• Pay-as-you-go model that allows them to be charged only for the services consumed. • Infrastructure can be scaled according to the application requirements; eliminating significant capital outlay. • Reduces the possibility of backend malfunctions; providing a secure space for implementing code.	• Allows quickly expanding of the infrastructure and ensuring high levels of availability by utilizing multiple containers for essential services. • Facilitates cohesion between organizations that have been engineered diversely. • Deployments and upgrades are streamlined.	• By combining Artificial Intelligence and cloud services, organizations can efficiently benefit from both applications at the same time while minimizing costs. • (AI) facilitates cloud data management and analysis, while cloud computing ensures data backup and recovery in a virtual setting.	• IoT (Internet of Things) refers to the network of physical devices that are connected and able to exchange data through the internet. • IoT devices generate massive amounts of data, cloud computing provides the scalability and flexibility needed to efficiently process and store this data.

Cloud Computing Government Use Cases

Every federal agency uses cloud computing to delivery mission services to the American people. Below are some additional use cases of government implementation of cloud-based services

Relevant Government Use Cases	Description and Use Case
2023 NDAA Makes Notable Changes to FedRAMP Program	On December 23rd, President Biden enacted the James M. Inhofe National Defense Authorization Act for the 2023 FY 23', creating new security objectives of confidentiality, integrity and availability which could be measured in regards to FedRAMP cloud services. This is to enable a smoother transition in the adoption and utilization of cloud solutions used by the government.
Cloud: Federal Agencies Face Four Challenges	Agencies transitioning to Cloud services must recognize and address areas of challenge such as meeting cybersecurity requirements, procuring services, managing a knowledgeable workforce, and monitoring expenses and savings.
Why cloud storage is the future of government	In a typical 90-day period, U.S. government websites tend to receive over 5 billion visits. As the popularity of digital methods and platforms grows, so does the quantity of data being produced, which has necessitated the introduction of the Federal Data Strategy (FDS). This 10-year plan will streamline current procedures and promote cooperation between different agencies in order to provide citizens with better access to information and services.

Cloud Computing Vendors and Products

The ITVMO has compiled this list to provide agencies with a basis of information related to industry leaders in cloud computing within the federal government; the list is not exhaustive, nor is it intended as an endorsement of any particular vendor or product. Instead, it should serve as a point of reference for agencies wishing to choose the most suitable vendor and product for their mission needs.

Cloud Infrastructure and Platform Services	Cloud ERP for Product-Centric Enterprises	Cloud AI Developer Services	Internet of Things (IOT)
• Amazon Web Services • Google Cloud • Microsoft Azure • Oracle Cloud	• Infor • Microsoft • Oracle (Fusion Cloud ERP) • SAP	• Amazon Web Services • Google • IBM • Microsoft • OpenAI	• AWS IOT Core • Cisco IOT Connect • IBM Watson IOT • Google Cloud IOT • Salesforce IOT Cloud

Individuals seeking a detailed inventory of cloud products and services may access the Federal Risk and Authorization Management Program (FedRAMP), which facilitates a standardized procedure for evaluating the security of Cloud Service Offerings.

Cybersecurity

Cybersecurity Overview

Cybersecurity measures include technologies, processes and practices that ensure the security of networks, computers and data from malicious attack, harm or unauthorised access. The COVID-19 pandemic has posed new challenges in regards to cybersecurity, as it necessitates measures to protect remote workforces. Additionally, a heightened geopolitical climate has emphasized the importance of strengthening IT security for organizations. Striking a balance between security needs and enabling employees to be productive and collaborative is a major challenge.

Increased Cybersecurity Risks

- 5G and network vulnerabilities
- Advanced Persistent Threat attacks
- Cloud adoption
- Mobile malware attacks
- Ransomware attacks
- Third Party Access
- Zero Trust Network access

Gartner's Recommended Security Solution Trends

Cybersecurity Mesh	Privacy-Enhancing Computing Techniques
Identity-First Security	Managing Machine Identities
Breach and Attack Simulations	Vendor Consolidation

Other advanced technologies, such as Artificial Intelligence (AI) and Machine Learning, can be adopted to more accurately anticipate and analyze security risks than the cyber-security solutions of prior eras.

Cybersecurity Government Use Cases

There are several ongoing Governmentwide Programs and Initiatives aimed at tackling the most pressing challenges facing federal agencies.

Relevant Government Use Cases	Description and Use Case
Biden-Harris Administration Announces National Cybersecurity Strategy	Responsibility for cyber security should not be solely borne by individuals, small businesses and local governments; the burden should instead be shifted onto those organizations better equipped to reduce risks for all..
Zero Trust Architecture (ZTA)	Executive Order 14028 requires federal agencies to implement a Zero Trust architecture. GSA has created a Buyers Guide to help agencies in implementing a Zero Trust framework. It is not possible to attain Zero Trust using a single solution; instead, agencies must create an integrated strategy in order to move towards this approach and should adhere to.
Endpoint Detection and Response	To implement Zero Trust, robust Endpoint Detection and Response (EDR) capabilities need to be in place as outlined in Section 7 of the EO. This entails deploying EDR tools to detect security incidents proactively, containing them at the endpoint, and providing prompt remediation and incident response.

Cybersecurity Vendors and Products

This list showcases some of the most influential cybersecurity providers in federal government. The list is neither exhaustive nor intended as a recommendation of any specific vendor or product. Rather, the ITVMO hopes this list can serve as a starting place for agencies interested identify the right vendor and product to meet their mission requirements.

- **Agile Defense**
- Bitdefender Gravityzone Enterprise Security
- Check Point
- Cisco Secure Endpoint
- Comodo Advanced Endpoint Protection
- Cortex XDR
- **Cyber Defense Technologies**
- Elastic SIEM
- **Ernst & Yound**
- ESET Endpoint Security
- Falcon Crowdstrike
- FireEye Endpoint Security
- **GCyber**
- IBM SIEM
- **IPSecure**
- McAfee Endpoint Security
- Microfocus ArcSight
- Microsoft Sentinel
- **MTI Systems**
- Netsurion Eventtracker
- Okta
- Palo Alto Networks
- **Quasars Incorporated**
- Rapid 7 InsightIDR
- **Sabre Systems**
- SentinelOne Endpoint Protection Platform
- Solarwinds Security Event Manager
- Sophos Intercept X
- **Stage2 Security Systems**
- Splunk Enterprise Security
- Symantec Advanced Threat Protection
- **Turbo Federal**
- **Verium**
- VMware Carbon Black EDR

Bold = New in FY 23

Cybersecurity Trends

Endpoint Detection and Response (EDR) and **Extended Detection and Response (XDR)** are advanced endpoint security technologies that facilitate enhanced visibility, detection of potential threats, and response capabilities across all endpoints.

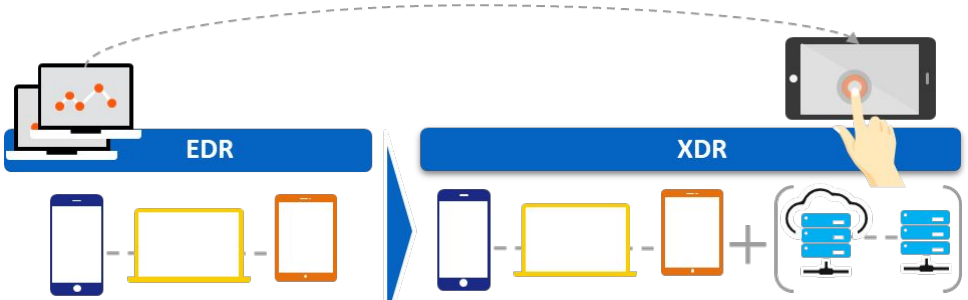
XDR Definition

"XDR is a SaaS-based, vendor-specific, security threat detection and incident response tool that natively integrates multiple security products into a cohesive security operations system that unifies all licensed components. XRD offers improved threat prevention, detection, and response." - **Gartner**

EDR and XDR Advantage

- Predictive analysis to identify advanced threats and new malware that may seek to evade established security measures.
- Improved productivity, protection and detection response capabilities.
- Total cost of ownership for detecting and responding to security threats can be reduced.

XDR is an advanced security incident detection and response platform, merging several products into a **comprehensively unified solution for primary incident response.**



This system monitors, stores and evaluates activities from multiple sources.

*Reliance on leading-edge machine learning and automation extends beyond endpoints to **encompass networks, servers, SIEMs, clouds, and more.***

Machine Learning

Machine Learning Overview

Machine Learning, which falls under the umbrella of Artificial Intelligence, permits machines to construct models that resolve problems by identifying patterns found in data as opposed to relying on explicit programming. This process of "learning" entails the refining of models through algorithms that distinguish patterns in data, enabling more precise outputs. **Supervised, unsupervised and reinforced** types of learning all exist within the framework of Machine Learning.

ML Categories	Category Definitions	Potential Use Cases
Supervised Learning	**Making predictions, recognizing data or classifying it.** Historical input and output data is utilized as source material to configure algorithms, which adjust the model in order to produce an output that approximates the desired result.	• Forecasting • Fraud Detection • Image Classification • Process Optimization
Unsupervised Learning	**Predictive models can be developed from data inputs that lack historical labelled responses.** Clustering and Association are two of the most common types of applications. Through clustering, objects can be divided into groups based on their properties; with Association, patterns and relationships between the clusters can be identified.	• Big Data Visualization • Customer Segmentation • Recommender Systems • Targeted Marketing
Reinforcement Learning	**Rewards or punishments can be administered based on desired or undesired behavior.** An algorithm can be trained to select the correct output based on certain variables, and this is achievable in areas where simulations are possible, where there is a lack of motion or voluminous data available.	• Learning Tasks • Real Time Decision Making • Robot Navigation • Skill Acquisition

ML Government Use Cases

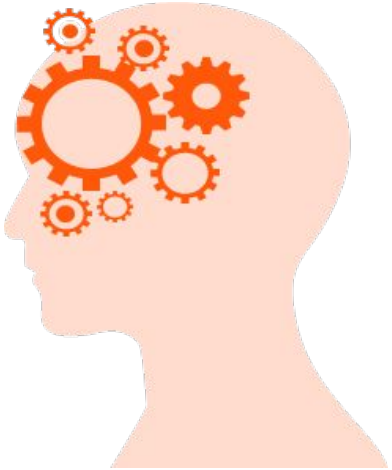
The federal government has multiple ongoing initiatives and programs dedicated to the application of machine learning.

Relevant Government Use Cases	Description and Use Case
Machine Learning and Tax Enforcement	The Internal Revenue Services (IRS) receives over 3 billion information returns annually from sources such as employers, banks, and different entities. With limited data and budget cuts, the IRS has been unable to fully utilize such information. As such, the Biden Administration proposed that a portion of the requested 55 percent increase in funding for the IRS be allocated towards developing machine learning technology. This could be beneficial in achieving targeted and productive enforcement actions, there are challenges posed by both machine learning methodology and US tax system complexity. This includes legacy effects of past budget depletion as well as future uncertainties associated with funding procurement.
Select Artificial Intelligence/Machine Learning Requirements in the FY 2023	Section 916 requires the Secretary of Defense to execute a demonstration of a Strategic Management Dashboard, utilizing AI and Machine ML capabilities to enable automated collection and visualization of the DOD's major management objectives. 'Strategic Management Dashboard' refers to a system that presents the data necessary for leadership personnel to make informed strategic decisions within the agency.
National Science Foundation (NSF)	The National Science Foundation was allocated an expenditure of $686 million for grants and initiatives related to Machine Learning, ethical practices, expansion of the National AI Research Institutes, as well as programs directed towards educating non-computer science students, with specific attention to minority-serving institutions.

ML Vendors and Products

The ITVMO presents a list of vendors and products associated with industry leaders in Machine Learning within the federal government. This list is not comprehensive or a recommendation of any particular vendor or product; instead, it endows agencies with an initial source to determine which vendor and product fulfill their mission needs.

- Algorithmia
- Altair
- Alteryx Designer
- Amazon Web Services
- Anaconda Enterprise
- **Apple**
- **Aurora Flight Sciences**
- Cloudera Machine Learning
- Databricks Lakehouse Platform
- Dataiku
- DataRobot
- Domino
- Google
- **Hyperscience**
- IBM Watson Studio
- KNIME
- MathWorks
- **Plainsight**
- RapidMiner
- Rstudio Team
- SAS Visual Statistics
- TIBCO Software
- **Unity**
- **Veda Data Solutions**



Bold = New in FY23

Robotic Process Automation

Robotic Process Automation Overview

Robotic Process Automation (RPA) uses software scripts that emulate human activities to automate repetitive tasks normally completed by people, such as extracting data, entering data into forms, and moving files. Leading edge RPA can also integrate with Artificial Intelligence/ Machine Learning.

How can RPA help your agency?

- **Data Entry**
- **Data Migration**
- **Report Generation**
- **App Processing and Review**

Key Success Factors

Federal agencies are utilizing Robotic Process Automation (RPA) in order to streamline and link financial systems, expedite HR requests, and automatically handle a multitude of acquisition activities. By leveraging RPA, federal personnel may free up their time to focus on important decision-making tasks, as well as better serve federal employees and citizens. We suggest that organizations prioritize processes for RPA, incorporating the following best practices and avoiding potential pitfalls:

- Changes that occur frequently can lead to inferior outcomes due to inadequate adoption.
- Integrating multiple data sources presents a challenge.
- Human error resulting in process failure can be costly.
- This requires structured data which does not involve subjective interpretation.
- Clear, established, and documented rules (e.g., flowcharts).
- Repetitive, time-consuming.

RPA Government Use Cases

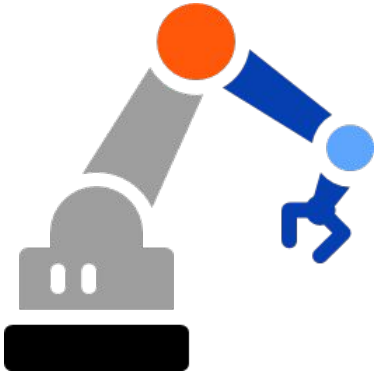
Government use cases for RPA have expanded considerably in recent years. Below are government use cases and information related to the Government-wide RPA Community of Practice.

Relevant Government Use Cases	Description and Use Case
Chatbots	For the past five years, GSA has been utilizing Robotic Process Automation (RPA) to provide chatbot functionality which aids in interfacing with stakeholders more efficiently.
Innovation	The Department of Transportation is conducting a “bot-a-thon” to facilitate the development of RPAs by its employees and contractors.
State of Federal RPA	The State of Federal RPA presents an extensive and insightful assessment of the utilization and influence of RPA in the Federal Government.
RPA Community of Practice	Agencies can address the technical, management and operational difficulties of designing and implementing a successful Robotic Process Automation program.
RPA Use Case Inventory	The "RPA Use Case Inventory (UCI)" was created by the CoP of the Federal RPA, offering detailed information on over 300 RPA Use Cases found across the Federal Government.

RPA Vendors and Products

The following is a list of vendors and products that are intended to highlight some of industry leaders in RPA within the federal government. The list is neither exhaustive nor intended as a recommendation of any specific vendor or product. Rather, the ITVMO hopes this list can serve as a starting place for agencies interested identify the right vendor and product to meet their mission requirements.

- Blue Prism Intelligent RPA Platform
- UiPath
- Automation Anywhere
- Appian RPA
- Automation 360
- Microsoft Power Automate
- ElectroNeek
- Kofax Robotic Process Automation
- NICE Robotic Process Automation
- SAP Intelligent Robotic Process Automation
- Automai Robotic Process Automation
- G1ANT
- AutomationEdge
- Datamatics TruBot
- OnviSource Automata
- ThinkAutomation
- Aiwozo



6G Technology (New in FY23)

6G Overview

6G refers to the sixth generation of wireless technology that is currently being developed and researched by experts around the world. It is expected to be the next major leap forward in wireless communication, offering faster speeds, higher capacity, and lower latency than its predecessors. The federal government can benefit from 6G technology in many ways, ranging from national security to healthcare and beyond. 6G is expected to launch in scale by 2030.

6G Importance to Federal Agencies

- With 6G, the government can enhance its surveillance and monitoring capabilities, as well as improve its communication and data exchange with military and intelligence agencies.
- This technology can also be used for disaster response and emergency management, enabling government agencies to quickly and efficiently communicate with one another and coordinate their efforts.

6G technology represents a significant opportunity for the federal government to improve its capabilities and better serve the public. By investing in research and development and collaborating with industry partners, the government can help to drive the development of this technology and ensure that it is deployed in a safe, effective, and equitable manner.

What can 6G do for your agency?

- Augmented and Virtual Reality
- Autonomous Transportation
- Internet of Things (IOT)
- Public Safety

6G Trends

There are several ongoing initiatives and programs focused on 6G in the federal government.

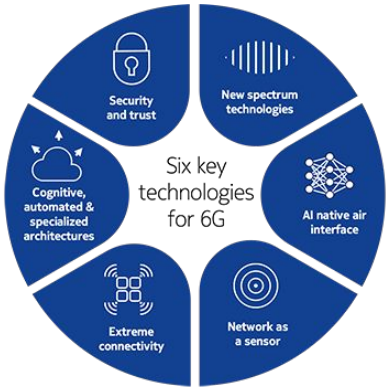
Relevant Government Use Cases	Description and Use Case
US House of Representatives Passes 6G Task Force	The US House of Representatives has passed a the “FUTURE Networks Act” requiring the Federal Communications Commission to set up a 6G Task Force and investigate ways to create and deploy 6G technologies in the United States. The FCC Chair will appoint representatives from the communication industry, public interest organisations or academic institutions and federal, state, local and tribal governments to the 6G task force, with at least one of each being allocated.
Pentagon backs new hub for developing, testing 6G technology	The Department of Defense (DOD) recently announced that it is supporting a new technology hub, Open6G, to promote the development of 6G communication technologies. This endeavor is part of the Pentagon's Innovate Beyond 5G (IB5G), aimed at exploring the possibilities for next-generation high-tech networks. As described in press release, Open6G is an "industry-university collaborative venture" designed to initiate research on open radio access networks (Open RAN).
Study: U.S. Underinvesting in 6G Tech	A new study has revealed that the United States is lagging behind in the development of upcoming communications technologies. The Department of Defense is investing more than $600 million to integrate 5G technology into their operations, but officials and other observers are also looking at 6G. In 2022, the Biden administration committed to spending $2.5 billion on 6G; however, the Center for a New American Security has argued that further investment is needed.

6G Vendors and Products

The following is a list of vendors and products that are intended to highlight some of industry leaders in 6G Technology within the federal government. The list is neither exhaustive nor intended as a recommendation of any specific vendor or product. Rather, the ITVMO hopes this list can serve as a starting place for agencies interested identify the right vendor and product to meet their mission requirements.

- AMD
- Apple
- AT&T
- Broadcom
- Cognizant
- LG
- Marvell Technology Group
- Nokia
- Nvidia
- Qualcomm
- Samsung
- T Mobile
- Verizon

"6G technologies will bring more than just improved data transmission speeds. Communications technology forms the conduit of societies, implicating future economic competitiveness, military strength and geopolitical influence" - **Department of Defense**



Appendix

Citations

Area	Citation (Link or Artifact)
Artificial Intelligence (AI)	• GSA ITC Phase 1 Deliverable • www.ai.gov • Artificial Intelligence (AI) – Digital.gov • https://www.whitehouse.gov/ostp/news-updates/2023/01/24/national-artificial-intelligence-research-resource-task-force-releases-final-report/
Blockchain	• https://www.whitehouse.gov/briefing-room/presidential-actions/2022/03/09/executive-order-on-ensuring-responsible-development-of-digital-assets/ • SoftwareReviews | Blockchain Basics | Make Better IT Decisions (infotech.com) • https://consensys.net/blockchain-use-cases/government-and-the-public-sector/
Computer Vision	• https://www.accenture.com/_acnmedia/PDF-17/Accenture-Computer-Vision.pdf
Cloud Computing	• https://avasant.com/report/government-cloud-platforms-2021-2022-radarview/ • Gartner Magic Quadrant 2023 Cloud • https://techgenix.com/top-6-cloud-computing-trends-for-2022/ov/strategy/ • https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/#benefits
Cybersecurity	• https://www.infotech.com/research/ss/cybersecurity-priorities-in-times-of-pandemic • https://www.gartner.com/smarterwithgartner/gartner-top-security-and-risk-trends-for-2022 • Federal Register: Improving the Nation's Cybersecurity • EDR, XDR And MDR: Understanding The Differences Behind The Acronyms (forbes.com) • What Is XDR? Extended Detection and Response l McAfee • Gartner Survey Finds the Evolving Threat Landscape is Top Priority for Security and Risk Management Leaders

Citations Continued

Area	Citation (Link or Artifact)
Machine Learning	• https://www.gartner.com/smarterwithgartner/understand-3-key-types-of-machine-learning • GSA ITC Phase 1 Deliverable • https://www.gartner.com/reviews/market/data-science-machine-learning-platforms • Cloudera: Machine learning in government: Saving Time, Money and Maybe Even the World
Robotic Process Automation (RPA)	• Assessing the State of Federal Robotic Process Automation (RPA) – Digital.gov • State of Federal RPA Report – Digital.gov • Robotic Process Automation (RPA) – Digital.gov • RPA Use Case Inventory – Digital.gov
6G	• https://fedscoop.com/pentagon-backs-new-hub-for-developing-testing-6g-technology/ • https://www.nationaldefensemagazine.org/articles/2022/1/31/study-us-underinvesting-in-6g-tech