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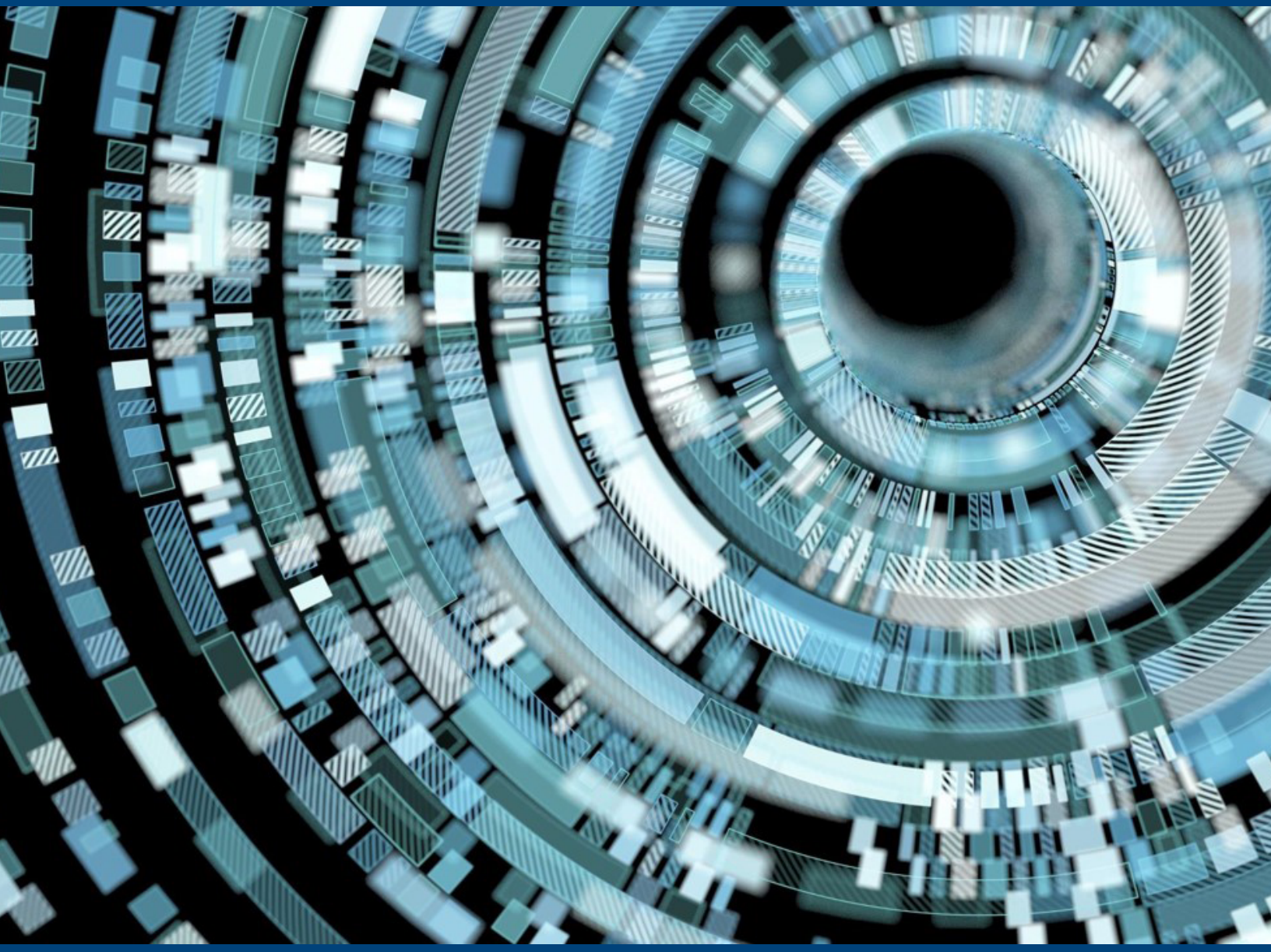

US Department of Veterans Affairs

Artificial Intelligence (AI) Strategy

July 2021

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Executive Summary

The Artificial Intelligence (AI) Strategy formalizes the vision for how the Department of Veterans Affairs (VA) will develop, use, and deploy artificial intelligence (AI) capabilities. Informed by the National Defense and Authorization Act (NDAA), the strategy will benefit the nations' Veterans and society, building on the American AI Initiative that was signed in 2019 and codified into law in the National AI Initiative Act of 2020. The VA-wide AI Task Force has developed the VA AI Strategy. The AI Executive Steering Group that will be established and defined by the Data Governance Council (DGC) in consultation with the current VA-wide AI Task Force will execute the VA AI Strategy.

According to Stanford's Human-Centered AI Institute's AI Index 2017 Report, AI tools have reached or exceeded human-level performance in narrowly defined tasks, including strategy games, visual image detection, and parsing natural language. Such performance creates new capabilities for improving service delivery, preventing and treating disease, and reducing barriers to Veterans applying for their earned benefits. To take advantage of these advances, the VA must understand both the potential and the risks of AI and how to embed AI and Machine Learning (ML) in the federal government to deliver more excellent value to our Veterans and the American people.

Although every federal agency will need to prioritize AI, the VA is uniquely suited to leverage it for at least two reasons. First, the VA has the most comprehensive combined administrative, financial, and medical record databases globally, providing important data sets for the training and testing of AI capabilities for improving health outcomes for our Veterans. Second, the decentralized network of local VA facilities can unite end-users and researchers across the country with close links to academic institutions and innovative private-sector counterparts. Utilizing the extensive VA network already in place, our goal is to become a hub for AI activity across the federal government to ensure that Veterans can benefit from the significant technological advances that are already happening.

Our strategy consists of four specific goals.

1

First, we will use existing AI capabilities to improve Veteran outcomes and experiences across the spectrum of benefits and services the VA provides. For example, we are leveraging existing computer vision technologies to identify disease early and improve treatment outcomes.

2

Second, we will increase VA AI capacity and capabilities. We can accomplish this by pioneering new processes for writing collaborative research agreements with third parties and actively supporting new research in academic journals.

3

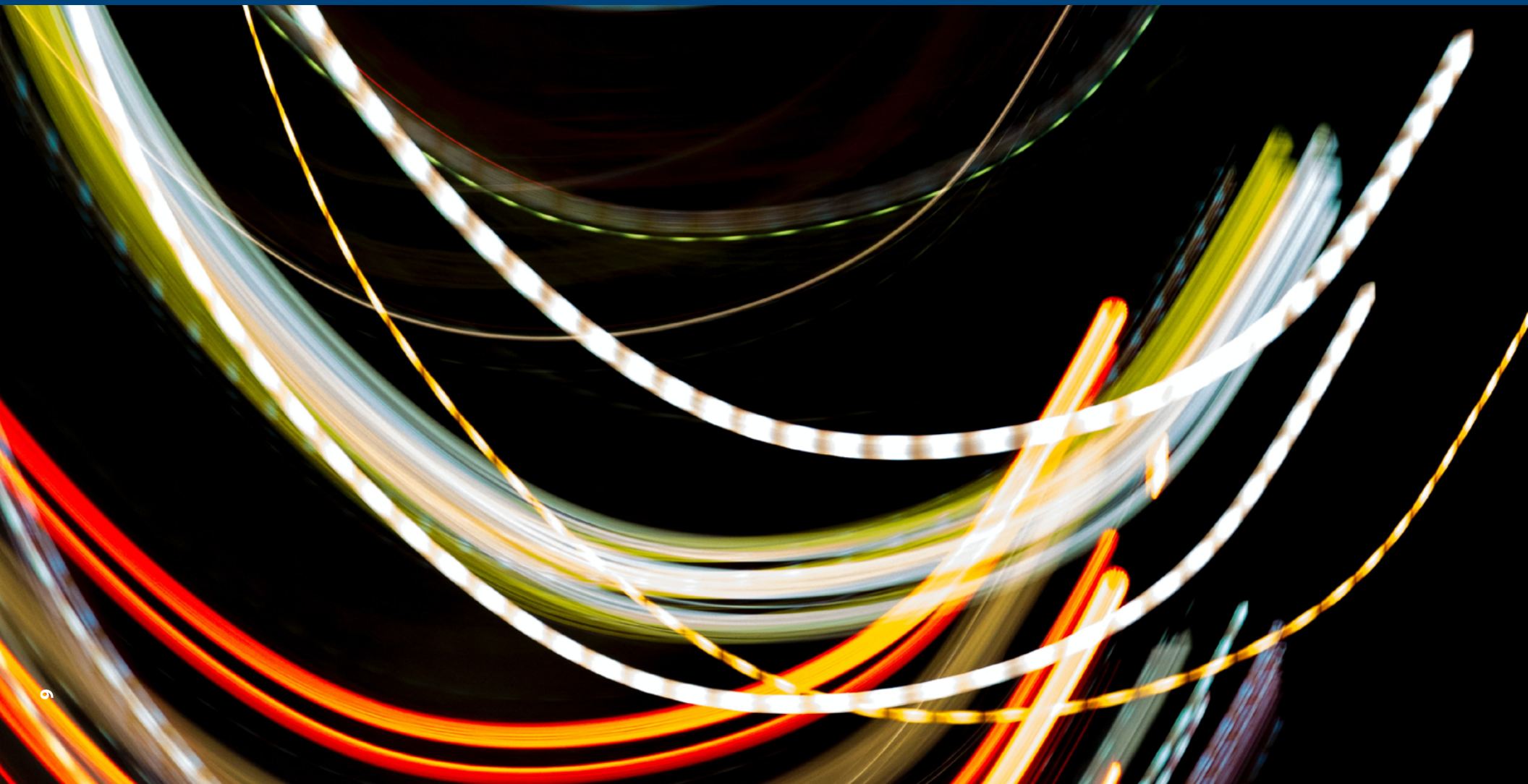
Third, we will increase Veteran and Stakeholder trust and confidence in AI. To this end, we are working to educate VA leaders and researchers on the principles of transparency, bias, and understandable AI.

4

Fourth and finally, we will expand upon the VA's existing partnerships across federal agencies and industry. The VA is already collaborating with other federal agencies on research and data sharing and overseeing AI technology sprints that bring industry partners to the table with specified objectives so that their participation creates a win-win opportunity. We will seek to build on these efforts and identify new approaches to collaboration that will accelerate the rate of knowledge discovery.

The Veterans Affairs AI Strategy articulates a clear vision. It also establishes a concrete set of goals, metrics, and priorities to help ensure that the VA is effectively tapping into the full capabilities of AI across all its initiatives. A clear strategy will enable the Department of Veterans Affairs to be a leader in Artificial Intelligence and change what is possible in healthcare and benefits delivery.

Introduction



In response to Executive Order 13859 on Maintaining American Leadership in Artificial Intelligence, the Department of Veterans Affairs conducted a comprehensive review of existing efforts and opportunities around Artificial Intelligence. The Department also held a series of strategy sessions to identify a vision, mission, and strategic goals for developing and implementing AI capabilities within the VA. The specific AI goals for the Department of Veterans Affairs are aligned with the National Artificial Intelligence Research and Development Strategic Plan. They are framed to keep our Veterans and our Mission at the center of everything that we do.

VA Artificial Intelligence Vision Statement

The VA's Artificial Intelligence vision is to improve outcomes and experiences for our Veterans by developing trustworthy Artificial Intelligence capabilities to support the Department of Veterans Affairs mission.

Mission Statement

The Department of Veterans Affairs will build robust capacity in Artificial Intelligence to develop and apply innovative AI solutions and transform the VA by facilitating a learning environment that supports the delivery of world-class benefits and services to our Veterans.

Aligning with National AI Strategic Goals

The National Artificial Intelligence Initiative Act of 2020 proposes an updating of national AI strategy every three years. The most recent strategy (2019) has identified eight strategic objectives as part of National AI R&D Strategic Plan. Combining these with executive orders on maintaining American leadership in AI and Trustworthy AI provides additional guiding principles. Building on this work, and aligning with the National AI Initiative Act of 2020's goals, four strategic objectives that strongly correlate with the VA's mission are listed below:

Strategy 1: Use existing AI to improve outcomes and experiences for our Veterans.

- Develop shared public datasets and environments for AI training and testing.
- Measure and evaluate AI technologies through standards and benchmarks.

Strategy 2: Increase VA Artificial Intelligence capacity and capabilities.

- Make long-term investments in AI Research.
- Develop effective methods for human-AI collaboration.
- Develop shared public datasets and environments for AI training and testing.
- Better Understand the National AI R&D Workforce Needs.

Strategy 3: Increase Veteran and stakeholder trust in AI.

- Understand and address the ethical, legal, and societal implications of AI.
- Ensure the safety and security of AI Systems.

Strategy 4: Build upon the VA's existing partnerships across agencies and industry.

- Expand Public-Private Partnerships to Accelerate Advances in AI.

The VA strategy seeks to align with this work and build on VA's Data strategy and other recent foundational agency efforts.

The VA AI Strategy

Strategy 1:

Use existing AI to improve outcomes and experiences for our Veterans.

Objectives	Key Performance Indicators
1. Create and maintain inventories of VA AI applications, industry capabilities, and VA use cases. 2. Establish standards and benchmarks for evaluating all AI solutions against existing regulations, applying Trustworthy AI principles, customer satisfaction, performance, and ROI. 3. Design and conduct pilots using AI to improve value, outcomes, and experiences. 4. Create a development and funding pipeline for scaling successful pilots to the enterprise level. 5. Integrate ML Ops into the existing DevOps framework to ensure that AI products are efficiently transitioned, integrated, maintained, and monitored.	1. Completion of annual AI Practice & Use Case Inventories. 2. Percentage of Agency use cases evaluated against outcome/implementation cost metrics. 3. Change in Patient/Caregiver Outcomes & Satisfaction in Pilot Areas. 4. Demonstrate Cost Savings as a Result of AI Implementation for pilots and scaled solutions.

There is now a large body of empirical evidence that AI can deliver substantial productivity and social gains if used and deployed appropriately, ranging from examples such as the early detection of cancer to detection of fraud in administrative systems.

In recent years, the use of Artificial Intelligence techniques has been shown to be able to improve operations and outcomes in business and other processes. Integrating these techniques (machine learning, computer vision, natural language processing, etc.) with existing VA business processes could improve efficiencies, scale solutions, and transform how the Department of Veterans Affairs operates. Hence, the first component of our strategy is to ensure that existing AI technologies are being used appropriately to improve outcomes and experiences for our Veterans, their families, and caregivers.

Implementing this strategy will require an enterprise-wide catalog of existing AI solutions and proposed use cases. Use cases will be evaluated against existing solutions to identify potential impact, barriers to implementation, and anticipated return on investment. The success and potential impact of any given AI application will be measured across three key performance metrics: customer satisfaction, other measurable outcomes, and return on investment (ROI). For the most impactful solutions, pilot studies will be conducted to determine the suitability of a solution and validate its performance prior to scaling them across the enterprise.

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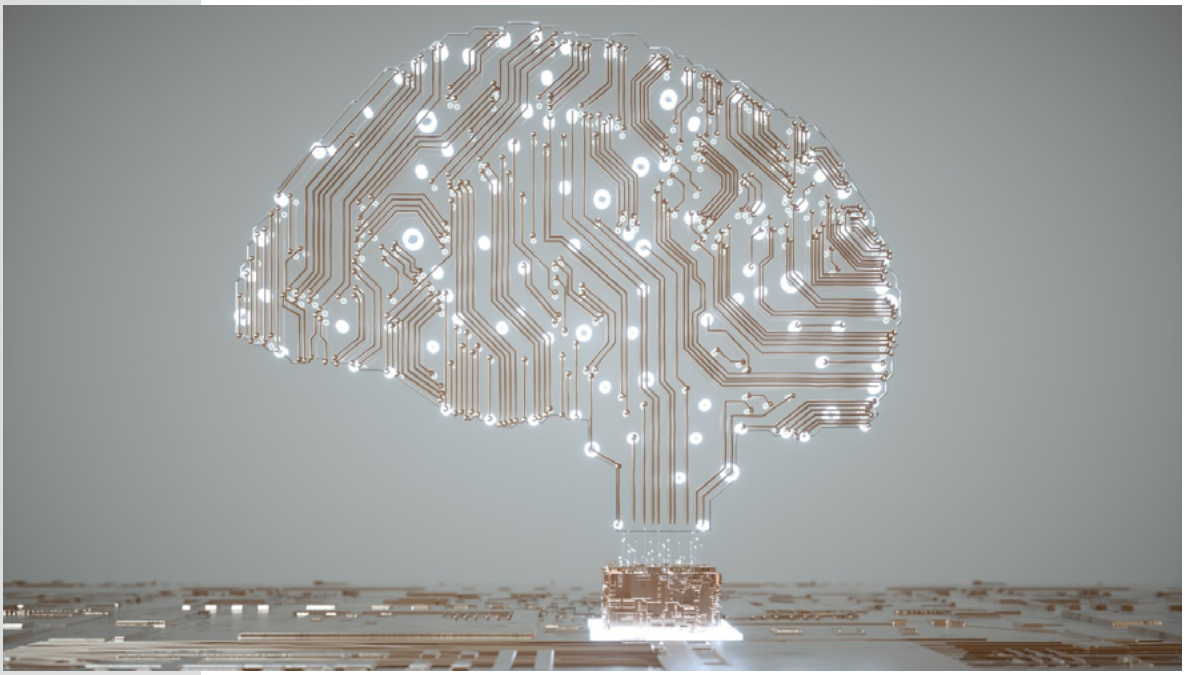
Finally, existing AI solutions will be monitored for performance and bias to ensure that the VA continues to derive the maximum benefit from these solutions. Applications whose performance, integrity, or usefulness have deteriorated will be addressed, and new use cases evaluated against the continually expanding capabilities of Artificial Intelligence and to ensure they meet the 9 principles of the Trustworthy AI executive order.



Strategy 2:

Increase VA Artificial Intelligence capacity and capabilities.

Objectives	Key Performance Indicators
1. Conduct and promote cutting-edge research into Artificial Intelligence applications and capabilities. 2. Continually assess AI workforce capabilities to identify gaps between mission needs and VA capabilities. 3. Provide AI skills training to VA researchers and developers. 4. Establish clear guidelines for what types of AI pilots require clearance through IRB approval, Privacy Office approval, and regulatory agencies like the FDA. 5. Recruit world-class AI Professionals and Data Scientists.	1. Growth in number of AI Research Studies and Pilots conducted. 2. Trended results of VA workforce need and capability assessments. 3. Size and competencies of VA AI & Data Science Workforce.

In addition to the existing AI techniques, new AI concepts are constantly emerging. Many of the most promising use cases for AI technology throughout the VA will benefit from long-term, fundamental investigations, and research. Specific areas of interest include developing ML capabilities to learn interactively, effectively, and persistently, the connection between perception and attention, human-like interaction, and the incorporation of learned models into comprehensive reasoning architectures. There is also a need for critical research in other core areas of AI. Those areas include commonsense reasoning and problem-solving, probabilistic reasoning, combinatorial optimization, knowledge representation, planning and scheduling, natural language processing, decision making, adapting AI for improved scalability and hardware, and trustworthiness and human interaction elements which are identified in Strategy 3.

Advances in these areas will enable advanced intelligent assistants, collaborative robotics, and fully autonomous systems. The development of standards and benchmarks is essential for measuring and evaluating emerging AI technologies to ensure they meet functionality, efficacy, and interoperability objectives.

The growing prevalence of AI technologies across all sectors of society creates new pressures for senior leaders to develop AI leadership competencies. This knowledge, diffused throughout the organization, will allow the Department of Veterans Affairs to increase trust and confidence in AI through education and engagement with beneficial programs.

Opportunities abound for core AI scientists and engineers with a deep understanding of the technology who can generate new ideas for advancing the boundaries of knowledge in the field. The VA must take the initiative to ensure a robust training program for current AI researchers and a recruitment pipeline for needed AI-capable talent.

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Strategy 3:

Increase Veteran and stakeholder trust in AI.

Objectives	Key Performance Indicators
1. Make available trustworthy AI training and other relevant resources to VA leadership, practitioners, and relevant end-users. 2. Build a community around AI that fosters learning and intra-agency collaboration. 3. Develop and distribute trustworthy AI Best Practices and management principles to ensure use cases are ethical, legal, and effective. 4. Assess the trust and concern expressed regarding AI by end-users and beneficiaries. 5. Develop a procedure for trustworthy AI certification that ensures the development and training of AI is based on representative samples that reflect the stakeholders that the VA services.	1. Percent of VA Leaders trained in AI management principles. 2. Size and engagement of AI@VA Community. 3. Best Practices auditing data from AI tools deployed in VA operations. 4. Results of surveys targeting AI trustworthiness. 5. Percentage of AI tools that meet criteria for trustworthy AI certification. 6. Percentage of VA employees that complete AI ethics training.

Despite unprecedented technological advances in AI, it will only have a positive social impact if the public trusts AI R&D processes and the use of AI. In addition to using AI responsibly, the clinical outcomes must be demonstrably improved in the absence of negative experiences that undermine trust. In the absence of that trust, particularly among Veterans, the VA cannot serve its primary stakeholder. Moreover, confidence in the application of AI will fuel continued investments in its R&D and pilots, which helps ensure continuous innovation. Fortunately, the federal government has recently adopted a new framework of trustworthy AI. The VA is implementing and applying that framework to all existing and future AI use cases.

To achieve trustworthy AI, initiatives must be established across the AI lifecycle from design to implementation. Further, employees engaged in the design, use, and dissemination of AI will benefit from trustworthy AI training opportunities. Empowering a community of dedicated VA employees passionate about AI technologies will serve to foster learning, collaboration, and the development of trustworthy AI. Once AI tools are implemented, it is necessary to monitor AI to ensure reliability, accuracy, effectiveness, and fairness. AI design and implementation need to be transparent and accountable to enable effective monitoring of AI. The VA must identify best practices that address understandable AI, developing unbiased and fair AI, AI tool integrity, and incorporate human-centered design.

Strategy 4:

Build upon the VA's existing partnerships across agencies and industry.

Objectives	Key Performance Indicators
1. Find industry leaders and practices that best align with VA Mission and Goals. 2. Collaborate with VA Governance Boards for AI implementation guidance. 3. Develop shared public datasets and environments for AI training and testing. 4. Expand Public-Private Partnerships to Accelerate Advances in AI.	1. Number of shared public datasets and environments for AI training and testing. 2. Number of Cooperative Research and Development Agreement (CRADA) and other strategic AI agreements executed annually 3. Participation in VA Governance councils for collaboration 4. Agencies represented in AI@VA communities 5. Shared projects or best practices across agencies. 6. Size and conversion percentage of AI use case library.

The constant advancements in artificial intelligence applications have transformed the way businesses work. AI enables faster, innovative new solutions and services and more informed decisions, which were missing in the absence of AI.

Artificial Intelligence technology is blossoming faster than ever imagined. As complex as AI sounds at the outset, AI tools have increasingly become easier to use. Thanks to engineers from tech giants such as Google, Facebook, and Uber and developers who routinely contribute to the open-source AI community and partnerships, AI is driving rapid innovation.

Strategy Execution Priorities

The VA AI Strategy will be continuously reviewed and updated to ensure its relevance and ability to support the Department of Veterans Affairs mission. Since the National Artificial Intelligence Initiative Act of 2020 requires updating the National AI Strategy every three years, the VA will update its AI strategy accordingly. In the next two years, the followings actions have been identified as having the most significant potential to impact the future of Artificial Intelligence within the VA:

1

Build a robust community and network around Artificial Intelligence at the VA

The VA can accelerate the adoption of Artificial Intelligence solutions by building a robust cohort of strategic partners and investing in its community of practitioners. Working across government, industry, and academia, the Department of Veterans Affairs can break down silos and collaborate to rapidly expand AI capabilities, increase efficiencies across government, and provide world-class service to our Veterans.

The more agencies collaborate on data harmonization and AI research & development, the better it is. Researchers will benefit from integrated data points there were not available before. Enabling an AI network of researchers and practitioners across the country's medical centers can serve as an integrated resource to be called upon, as needed, and for novel research to be quickly deployed. These capabilities could provide significant value to the VA's continued efforts, such as initiatives to prevent Veteran suicide and end Veteran homelessness.

Within the VA, we will form a tightly knit community focused on developing AI professionals, connecting them with peers & mentors, and identifying innovative solutions to tomorrow's challenges. These thought leaders will act as force multipliers for socializing AI concepts and championing new practices across the enterprise. By engaging with our community of practitioners, we can invest in their development while aligning their efforts with our strategic goals and objectives.

2

Prioritize and invest in AI research

The VA possesses one of the richest datasets in the world, encompassing clinical care, benefits administration, fiscal processes, and administrative data. By investing in data as a strategic asset, the VA can ensure AI-Ready datasets are available for research & development. Further, by prioritizing VA funding for Artificial Intelligence research, VA researchers can have a tremendous impact on the pace and direction of AI and AI-enabled research for the foreseeable future. The significant value AI can bring to our mission will continue to grow and compound as our investment in AI research translates what is theoretically possible into best practices for adoption. The results of these efforts can be further reinvested by applying new AI techniques to research questions in a myriad of fields and disciplines.

3

Reduce barriers to translating AI advances into real-world capabilities

When AI research produces new insights, that investment in research must be fully realized by translating those insights into new capabilities to serve our Veterans. To that end, the VA will establish clear processes and resources to support the development and testing of new AI solutions, piloting them for feasibility and supporting their adoption across the enterprise.

The VA will create a common extensible environment for AI development and testing. Mature models will have clearly defined pathways for validation, testing, and certifying readiness for integration with operations. Multi-disciplinary pilots will be supported by ensuring adequate appropriation set-asides to increase VA's agility in responding to emerging use cases and circumstances.

4

Adopt an AI maturity model tailored to the VA's mission and needs

By adopting an AI maturity model, the VA will conduct an in-depth assessment of its current use cases, capabilities, and resources. Once complete, the maturity model will assist in aligning AI strategy with data, technology, talent, and policy to create new opportunities and solutions to improve outcomes and experiences for our Veterans. Identification of capability gaps, a product of in-depth assessment, will identify areas for investment and training at each stage of the maturity model to ensure resource investments are always maximizing their benefit to those we serve.

Conclusion

The emergence of Artificial Intelligence offers the potential for significant social, fiscal, healthcare, and economic benefits. Never before has the expansion of data at scale, the computing power, talent, and the reliability of available algorithms converged to deliver so much potential value, allowing researchers and the agency alike to make incredible scientific, organizational, and educational discoveries.

The Department of Veterans Affairs recognizes the development and implementation of AI comes with incredible potential benefits and inherent risks. Committing to a formal and explicit AI strategy will realize the benefits of AI for our nations' Veterans and properly mitigate any associated risks. Furthermore, the vision and mission of the VA Artificial Intelligence Strategy establish a concrete set of objectives and metrics that can be used to measure success and identify opportunities to pivot.

The actions identified for execution by this strategy represent early areas of emphasis that have the potential to rapidly increase the VA's Artificial Intelligence capabilities and capacity. Building a strong network that spans government, industry, academia, and our own internal communities will unchain innovation and empower practitioners to identify and propose solutions to problems in real-time. Investing in AI Research and the datasets that enable it will allow the VA to solve previously insurmountable problems. For instance, the use of AI could help us predict acute kidney injury (AKI) up to 48 hours in advance, providing clinicians a chance to take mitigating actions. Therefore, ensuring that a pathway exists from research to operational impact is the only way to realize the full value of our investments in research. Finally, adopting and monitoring an AI Maturity Model will provide confidence that the VA remains on track to become a world leader in the use of Artificial Intelligence to improve lives. For additional inquiries, please refer to the VA National Artificial Intelligence Institute as Point of Contact (POC) (naii@va.gov).

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