ARTIFICIAL INTELLIGENCE FEDERAL WORKFORCE CERTIFICATION

EMERGING TECHNOLOGY COMMUNITY OF INTEREST
Artificial Intelligence Working Group

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Synopsis

The ACT-IAC AI Working Group launched an "AI Curriculum Committee" with the goal to explore how to assess the AI knowledgebase across the Federal workforce. Given that strengthening Federal agencies' AI knowledge could have direct impact on the government's ability to fulfill its mission, making certain that there was a minimum standard of AI understanding within the government is a strong first step. In addition, a foundational understanding of artificial intelligence and digital competencies will equip more Federal employees with knowledge to make ethical decisions applying AI to solve the many agency mission goals. The paper documents a minimum threshold to certify this workforce.

American Council for Technology-Industry Advisory Council (ACT-IAC)

The American Council for Technology-Industry Advisory Council (ACT-IAC) is a non-profit educational organization established to accelerate government mission outcomes through collaboration, leadership and education. ACT-IAC provides a unique, objective, and trusted forum where government and industry executives are working together to improve public services and agency operations through the use of technology. ACT-IAC contributes to better communication between government and industry, collaborative and innovative problem solving, and a more professional and qualified workforce.

The information, conclusions, and recommendations contained in this publication were produced by volunteers from government and industry who share the ACT-IAC vision of a more effective and innovative government. ACT-IAC volunteers represent a wide diversity of organizations (public and private) and functions. These volunteers use the ACT-IAC collaborative process, refined over forty years of experience, to produce outcomes that are consensus-based.

To maintain the objectivity and integrity of its collaborative process, ACT-IAC welcomes the participation of all public and private organizations committed to improving the delivery of public services through the effective and efficient use of technology. For additional information, visit the ACT-IAC website at www.actiac.org.

Emerging Technology Community of Interest

ACT-IAC, through the Emerging Technology Community of Interest, formed an Artificial Intelligence Working Group to give voice to and provide an authoritative resource for government agencies looking to understand and incorporate AI/ML technology and functionality into their organizations. This working group includes government and industry thought leaders incubating government use cases. The ACT-IAC Emerging Technology Community of Interest (ET COI) mission is to provide an energetic, collaborative consortium comprised of leading practitioners in data science, technology, and research, engaged with industry, academia, and public officials and executives focused on emerging and leading technologies which transform public sector capabilities.

Disclaimer

This document has been prepared to contribute to a more effective, efficient, and innovative government. The information contained in this report is the result of a collaborative process in which several individuals participated. This document does not – nor is it intended to – endorse or recommend any specific technology, product, or vendor. Moreover, the views expressed in this document do not necessarily represent the official views of the individuals and organizations that participated in its development. Every effort has been made to present accurate and reliable information in this report. However, neither ACT-IAC nor its contributors assume any responsibility for consequences resulting from the use of the information herein.

American Council for Technology-Industry Advisory Council (ACT-IAC)
3040 Williams Drive, Suite 500, Fairfax, VA 22031
www.actiac.org ● (p) (703) 208.4800 ● (f) (703) 208.4805

Executive Summary

As Artificial Intelligence (AI) is fast becoming an influential cornerstone of the digital future and AI knowledge professionals are needed across government. To address this need, the ACT-IAC Artificial Intelligence Working Group proposes a path to improve knowledge of AI in the Federal government and contractor workforce, including organizational and ethical implications in addition to critical technical skills. This paper in this discussion paper provides the minimum viable platform to organize, onboard, train, test, and certify this workforce.

Through collaboration between industry and government thought leaders, ACT-IAC maintains evergreen guidance on the application of AI in government, including a primer[1], playbook[2], standards, and an ethical application framework[3] to guide developers and stakeholders of AI applications in ensuring their beneficial creations do not result in unintended and/or unethical outcomes for the very citizens these applications are meant to serve. The ultimate goal in developing AI applications is to meet mission needs, but must simultaneously ensure trust and transparency of these tools and the outcomes they provide. This complementary report provides guidance on certifying cross-functional human teams building and leveraging AI applications. With an AI certification, the government will be able to verify that a certain level of knowledge is possessed by individuals who may support their AI project and service needs. The ultimate certification process will ideally involve oversight from Federal agencies that are considered AI thought-leaders and those that have the capacity to set Federal standards and governance accordingly.

This first iteration will address knowledge with later iterations addressing certification of skills and abilities.

Recommended AI Knowledge Certification Program

This paper recommends a Service Management Office (SMO) structure wherein a Federal agency takes the lead in a Federal AI Workforce Certification. One such agency could be the Veterans Affairs National Artificial Intelligence Institute (VA NAII). The jurisdiction of the lead agency could include establishing, governing, and maintaining the criteria for an AI knowledge certification program and management of the Federal government's talent within the Advanced AI Core. The AI knowledge certification program would leverage training courses and specific exams offered by local commercial vendors in conjunction with private institutions within a possible partnership structure across academic institutions such as the Historically Black Colleges and University (HBCU), STEM consortium, Harvard University, Johns Hopkins, Georgetown, etc. The certification process will be dynamic and be continuously audited for compliance and oversight purposes by the lead agency.

The learning tracks for the AI Basic and Intermediate certifications are envisioned to qualify for the Federal Acquisition Institute (FAI)[4] and General Services Administration Online University (OLU)[5] Continuous Learning Points (CLP) and shall establish criteria Federal employees would be required to achieve in order to fulfill the expectations and confidence required from the missions set forth by their respective agencies.

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Additionally, the Advanced AI Core will provide for the advanced development of Federal employees' AI skill sets with the objective to promote continuous learning and expertise designed to be solution-oriented throughout the Federal workforce. Federal AI mentors shall be identified via a rigorous vetting taxonomy to ensure proper utilization and placement of the digitally talented workforce. Mentors will also work with the SMO to aid in the design and strategic advisement of practical policies and incentives that foster talent management and increase recruitment and retention to Federal service. The NAII's proposed selection as the designated SMO was recommended based on the organization's charter which mandates the development of AI research and development capabilities within the VA and across government as a means to design and collaborate on large-scale AI R&D initiatives, national AI policy, and partnerships across agencies, industries, and academia. The NAII has capabilities to pilot/proof for the SMO model focusing on the people and services.

Path Forward

Figure 1 below displays the notional architecture of the SMO model which could provide the interface between the agencies and the components of the Federal AI education system. The SMO would govern and provide oversight across three distinct components of the AI educational certification process. Moreover, certifications would be held on a secure, immutable and auditable Federal education blockchain for verification and validation of successful completion of exams by participants.

Exam certifications would be available across three components:

1) **Basic AI Education**: Assumes no prior knowledge of AI. Distributed through public-private partnership. Easy access on web and mobile phone devices with a well-designed UX and simple email login process.

2) **Intermediate AI and Experiential Learning**: Prerequisite of "Basic AI Certification." The intermediate stage consists of specialized exams within the distinct categories of AI knowledge. Additionally, participants will work on hands-on projects employing learnt AI tools such as Python/R, Jupyter Notebooks, TensorFlow, Keras, and others. Participants work on real world solutions under the supervision of certified Federal AI mentors.

3) **Advanced AI Core** - Prerequisite of "Federal AI Mentor" experience to continue to support and grow the AI knowledge base and experiences. Required to teach, research and present long-term and high-impact AI discoveries and provide thought-leadership, input, and strategic direction to the SMO as needed.

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Figure 1: AI Service Management Office (SMO) Structure

Basic AI Education: Provides an easy-to-use framework of questions and answers that are geared to give users the most basic foundational knowledge about AI. The purpose is to inspire Federal employees to become excited and gain confidence. Moreover, Basic AI Education serves as an on ramp for those to begin their AI knowledge journey. Gamification concepts and design best practices are leveraged so that new participants do not feel overwhelmed, rather they are energized to learn more about AI.

The vision is that Basic AI Education serves as the ramp for anyone in the Federal government that has access to the internet or mobile smart phone. This exam consists of levels which are progressively more challenging to complete, with certification awarded upon completion of each level.

Intermediate AI and Experiential Learning: This stage consists of specialized exams within the distinct categories of AI knowledge to further the development established in Basic AI. Participants will work on hands-on projects employing learnt AI tools fielding inquiries and reflecting upon their work in real-time. This experiential design fosters a collaborative applied learning environment that yields a user experience anchored in participants working on real-world solutions under the supervision of certified Federal AI Mentors.

The vision of **Intermediate AI and Experiential Learning** serves as a non-invasive pedagogy that provides Federal employees with a high probability of excelling through real world training. Upon successful completion of the specialized exams, certification will be awarded per the education guidance set forth by SMO leadership and its codified requirements.

Advanced AI Core: Provides for the advanced development of Federal employees' AI skill sets with the objective to promote continuous learning and expertise designed to be solution oriented throughout the Federal workforce.

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Conclusion

The AI Working Group – Curriculum Committee includes participants from government, industry and academia and has a goal to address the need for Artificial Intelligence (AI) knowledge across the nation's Federal workforce. Strengthening the AI knowledge of the workforce will instill confidence in the evolving skills essential to coordinate and collaborate on the development of this critical capability. This approach will significantly benefit a Federal agency's ability to fulfill its mission.

Embarking on the path outlined in this program will equip more Federal employees with knowledge to assess the efficacy of design, development, and deployment of these technological capabilities. It will further ensure the appropriate application of AI technologies to solve the perplexing problems facing many Federal agencies. Through level setting the skills essential for AI, we will be able to assess and develop the requisite talent to ensure the United States continued competitive advantage.

Having a standard certification process with the oversight from a SMO will provide the foundational layer to build the next generation AI workforce. The program documents the minimum viable platform to test and certify the federal workforce. The three components of the platform provide a possible framework to address the needs to upskill our labor force and to build more capacity to effectively leverage AI capability's in support of national priorities.

As the AI industry continues to evolve, so too will the certification process and the standards of requisite training and knowledge needed to improve our modernization of government. The AI Working Group believes that such an effort will significantly benefit America and push our country into the global AI leadership position.

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Authors & Affiliations

This Discussion Paper was written by the ACT-IAC AI Working Group - Curriculum Committee, a consortium of government and industry. The organizational affiliations of these contributors are included for information purposes only. The views expressed in this document do not necessarily represent the official views of the individuals and organizations that participated in its development.

Sandy Barsky   Federal Government
Jim Liew   Johns Hopkins Carey Business School
Adam Wood   Harvard University
Frederic de Vaulx   Prometheus Consulting, Co Chair
Nevin Taylor   Department of Veterans Affairs, Co Chair
Renata Maziarz   HHS Office of the Inspector General
Joyce Hunter   Vulcan Enterprises LLC
Swathi Young   TechNotch Solutions
Jessica Davis   Microsoft
Todd Hager   Macro Solutions
Orlando Lopez   National Institute of Health
Don Lovett   Government of the District of Columbia
Sean Manion   ConsenSys
Oki Mek   Department of Health and Human Services
Craig Fischer   Bureau of the Fiscal Service
Todd Lyle   Council for Cyber Risk Control
Tim Gilday   GDIT

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