National Institute of Standards and Technology, U.S. Department of Commerce

RFI: Developing a Federal AI Standards Engagement Plan

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Submitted By:
Deloitte Consulting LLP | 1919 North Lynn Street | Arlington, VA 22209

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Our Understanding

NIST is requesting information on AI Technical Standards and Tools that Deloitte is well-suited to provide. Deloitte takes a portfolio-based approach to AI, recognizing AI as an umbrella of technologies that can be used together as part of a cohesive digital strategy. Deloitte illustrates AI as a spectrum with three main horizons:

Horizon 1
Assisted Intelligence

Robotic Process Automation
Mimics humans performing rules-based tasks to improve efficiency, quality, and accuracy of process outcomes, as well as increase flexibility and opportunity to scale

Big Data Governance, Management and Integration
Design and implement **large scale data programs** and analytics platforms that promote organizational intelligence

Analytical Solutions
Develop, manage and operate a suite of **data-powered solutions** that address our clients **most complex business issues**

Horizon 2
Augmented Intelligence

Intelligent Automation
Use of NLP and Machine Learning to enable processing of unstructured data, predictive and prescriptive analytics and **automation of tasks that involve judgment**

Cognitive Analytics
Transform extensive, unstructured data into **meaningful, focused, human-like insights** and recommendations upon which humans can act

Narrow AI
Applies **deep statistical learning** to train models to become more precise and efficient over time in predictions and judgment

Horizon 3
Autonomous Intelligence

General AI
Machine intelligence that **fully replicates human intelligence** including independent learning and decision making

Blockchain
Pair blockchain technology with machine intelligence to automate, perform and orchestrate activities and processes **without any human intervention**

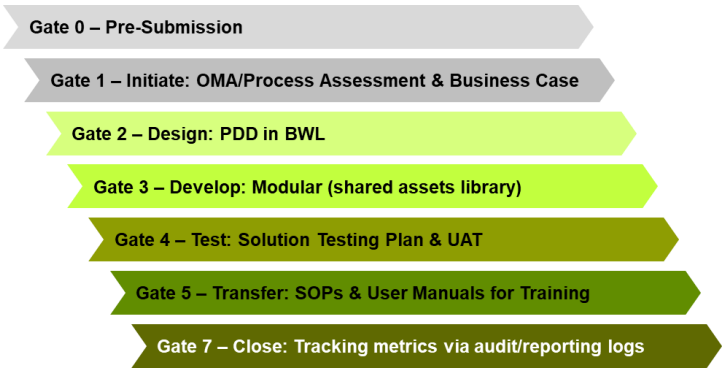
In providing NIST information on AI Technical Standards and Tools, Deloitte leverages its Government and Public Service Consulting practice as well as its Commercial Consulting practice to provide insights from both the public and private sectors. Deloitte is also able to draw from global insights developed across its network of member firms and from its client relationships and third party alliances with the leading technology vendors developing AI products and tools.

Our Experience

Deloitte's experience as a leader in the federal RPA market well-prepares it to help NIST identify Technical AI Standards and Tools. Deloitte supports over 30 federal agencies with RPA projects and has developed leading practices/standards/tools that make these projects possible. These leading practices apply to AI projects regardless of what horizon they align to (15) – furthermore, while the majority of federal agencies are at the beginning of their AI journeys, utilizing tried-and-true tools/standards is critical to establishing the technical framework and strategic foundation for more advanced AI technologies. Below we will highlight some examples of standards/tools we have developed for RPA programs and how they enable greater efficiency in scaling and align with strategic priorities. These standards/tools are relevant across the AI spectrum.

Gate Review Approach (5)

Included in the Deloitte approach is a quality control mechanism, or gating process. Deloitte utilizes our Robotics Center of Excellence to administer the gates, thus achieving a level of consistency and quality across our many RPA engagements. For the first gate, we have developed a methodology for evaluating process complexity and developing the business case for automation.



**Number references throughout reference the possible topics list referenced from the RFI (1,2,3, etc.)*

Operating Model Assessment (OMA) Workshop: Evaluating Process Complexity and Capturing Business Value Metrics

Deloitte conducts an OMA workshop to prioritize and select processes for automation. Based on previous experience, Deloitte is able to foresee potential roadblocks such as GFE hardware issues, existing software issues, or access issues, and troubleshoot them before development. Additionally, Deloitte has developed both quantitative and qualitative criteria by which to compare processes and select the most suitable for automation. For example, in addition to quantifying the number of hours saved by having bots complete manual tasks, Deloitte would consider the impact of repurposing human workers to higher value work as well as the effect on employee morale. Other quantifiable metrics would be the reduction of errors when completing specific tasks and efficiencies gained by streamlining business processes.

Evaluation Criteria	What we analyzed	What we found
Strategic Alignment	Investment Alignment to Strategic Priorities	Aligned to 6 Priorities
Financial Impact	Average Annual Cost Savings	$1.96M
	5 Year Cost Savings	$9.81M
	Payback Period	11 Months
	5 Year Return on Investment	205%
Operational Value	Process Efficiencies: Processing Time	30% Faster
	Process Efficiencies: Daily Throughput	4.4X Increase
	Improvement in Data Analytics Capability	3 New Capabilities
Workforce Impact	# of Employees Reallocated	66
	Annual Labor Hours Saved	79,200
	Reduction in Case Workload per Tax Examiner	483 Less Cases per TE

Eventually, monetary, non-monetary, and/or functional benefit measures and benchmarks can be used to define the success of the business case. Metrics and benchmarks will drive conversation around how recovered time could be repurposed towards mission-driven work or how best to reorganize employees. The business value metrics would also aid refinement of the order in which processes are automated. Those processes which provide higher return on investment would be automated sooner in alignment with agencies' AI strategic goals.

Develop Process Definition Document

Another tool/standard Deloitte employs on all its federal RPA projects is the development of a Process Definition Document (PDD). The purpose of a PDD is to: (1) define the robotic process automation scope, (2) describe the automated process step-by-step, to include detailed process diagrams, technical systems, process triggers, and process inputs and outputs, and (3) provide a detailed keystroke mapping of the end result automated process, and request formal acceptance of the application design and sign-off from project sponsors. Deloitte developers build PDDs in IBM Blueworks Live (BWL) in collaboration with functional SMEs. Deloitte leverages BWL for building its PDDs to improve communication and promote standardization. BWL is an online tool that allows multiple users to create and update PDDs at the same time thus improving version control. BWL PDDs can also be shared across an organization with ease and reviewed easily to help ensure all documentation follows a consistent standard. This can improve communication cycle time when revisions are necessary. Within each step of the automation, BWL allows users to provide additional details such as system tagging that can be used to help identify which bot processes (and which steps within those processes) will be impacted by system upgrades. As agencies scale their RPA programs, the use of Word-based documentation can be difficult to monitor, manage, and gain valued insights from, while BWL is specifically designed to support a larger RPA program and applicable across the AI spectrum.

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Digital Labor at Scale

Tools and techniques established in the early gates of the review process are critical to deploying RPA at scale. An organization's first 10 bots are deployed differently than its next 50. As RPA programs grow in size, PDDs and following development/test/transfer stages should be streamlined and conducted in a highly agile and iterative manner. These same scaling principles apply to deploying more advanced AI technology.

Through practical experience delivering digital labor solutions across the public sector, Deloitte has developed a framework to sustain and scale RPA programs as well as more advanced AI capabilities. Within this framework there are six core competencies: maintaining relationships with vendors, fostering knowledge & adoption of digital labor *(training)*, collecting metrics & performance reporting, managing change and physical workforce impact of incorporating digital labor, establishing agency policy as it relates to building/deploying AI, and capturing lessons learned along your digital labor journey. Planning and foresight within each of these areas paves the way for scale beyond the pilot – and help ensure agencies do so in alignment with/aided by technical tools and standards.

Shared Asset Libraries

Additionally, Deloitte incorporates traditional software development leading practices to help make the development experience feel more natural to the developers. This in turn can yield higher quality deliverables. It also teaches developers to utilize modularization of code wherever possible to promote re-usability. This can help accelerate future work when the same small pieces of work need to be repeated and increases the efficiency of development timelines.[1]

Audit/Reporting Logs (8)

RPA software is designed to provide audit logs and process specific analytics, which allow developers to understand the systems where the bot will perform actions and test functionality, and debug without being in the live environment. Deloitte teams configure and utilize these audit logs to guide bug fixes and test readiness for production. These logs can be consolidated into easy-to-digest reports. The reports will be produced on a regular cadence as determined by the agency with the ability for ad-hoc generation as well.

Solution Testing Plans (8)

The team also examines data to determine the most frequently accessed areas of the processes being automated. Once these areas are identified, Deloitte will work to create a Solution Test Plan that encapsulates these frequent process test cases. Some of these test cases will help demonstrate possible worst-case scenarios that might arise and how those issues should be handled. The creation of test plans for both positive path (i.e., successful automation runs) and negative path testing (i.e., unsuccessful automation runs) confirms the automation will be robust enough to continually run within production. All solution test plans are reviewed with agency staff and process owners to help ensure that test cases cover the appropriate scenarios to move the bot into production. The solution test plans are also leveraged by agencies to conduct UAT activities during later testing phases.

Credentialing (8, 17)

For the latter stages of the gate review process, Deloitte has helped agencies to comply with standards around bot credentialing. As noted in OMB Memorandum M-19-17, titled *Enabling Mission Delivery through Improved Identity, Credential, and Access Management*, agencies are compelled to ensure the "digital identity is distinguishable, auditable, and consistently managed across the agency" – accordingly, Deloitte has helped agencies to issue Public Key Infrastructure (PKI)-based credentials in accordance with Federal certificate issuance capabilities and in alignment with updated federal policies.[2]

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[1] https://www2.deloitte.com/content/dam/Deloitte/us/Documents/public-sector/us-fed-shared-process-robotics-asset-libraries.pdf

[2] https://www2.deloitte.com/content/dam/Deloitte/us/Documents/public-sector/us-gps-robotic-process-automation.pdf

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Federal Robotics and Cognitive Consortium (FRCC) (3,4,6,7)
Deloitte co-founded the FRCC to help ensure that standards/tools as well as leading practices are shared across the federal government in a timely and consistent manner. From our experience helping the government to deploy RPA solutions, we have seen common challenges across all sectors (defense, civilian, health, security, etc.) and functions (finance, HR, procurement, etc.). Building on previous government experience and standardizing knowledge sharing is critical to addressing these challenges in an organized and efficient way.

Conclusion

Deloitte is a market leader for implementations across the AI spectrum. **In fact, Deloitte was recently named a worldwide leader in AI Services by the International Data Corporation (IDC)[3].** Deloitte has helped the federal government in implementation, standards and tools from the beginning; starting with the first bot at NASA and continuing today. In creating the FRCC, we laid the foundation for knowledge sharing across the federal government to promote standards/tools in addition to raising awareness of leading practices and lessons learned from previous implementations.

By enabling agencies to rapidly adopt established standards/tools, we can build strong foundations for AI in government – allowing agencies to move along the AI spectrum through an enterprise-level approach as well as engage proactively in pilot AI projects.

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[3] https://www.idc.com/getdoc.jsp?containerId=US44514819

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