AI-Powered SNAP Modernization

An Introduction to Current and Potential Uses of AI in SNAP Case Processing

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This publication—the first in a three-part series that the American Public Human Services Association (APHSA) will release on the use of Artificial Intelligence (AI) in Supplemental Nutrition Assistance Program (SNAP) case processing—explores how AI is currently used, and how it might be used in the future, to support administrative actions that agency staff complete when processing customers' SNAP cases. In addition to desk and primary research, this brief was informed by input from APHSA's wide network of state, county, and city members and national partners in the human services and related sectors.

This brief offers:

- **Definitions and distinctions** between AI, automation, and sub-categories of advanced technologies that are or can be used for benefits delivery;

- **Example use cases** from public sector programs and services that operate similarly to SNAP and/or that serve overlapping populations with SNAP; and

- **Early reflections on potential applications** of AI within SNAP case processing operations as informed by a wide range of affected parties, including but not limited to state and county agencies that administer SNAP, the USDA Food & Nutrition Services (FNS), organizations that invest in civic technology and in human services, and industry partners to government agencies.

Upcoming briefs will offer:

- **The second publication** in this series will detail the rapidly changing policy landscape surrounding the use of AI in SNAP and explore potential enabling policy actions to support this use. A topic of note will include implications of the 2023 Executive Order 14110, "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence,"[1] and the Office of Management and Budget implementation memorandum, "Advancing Governance, Innovation, and Risk Management for Agency Use of Artificial Intelligence."[2]

- **The third publication** in this series will focus on the relationship between technological innovation and our shared commitment to equity. It will discuss customer-centered use cases of AI aimed at improving customer experience accessing SNAP alongside appropriate guardrails that need to be put in place to minimize potential risk and bias while maximizing security. Input from SNAP customers and frontline staff will critically inform this final publication.
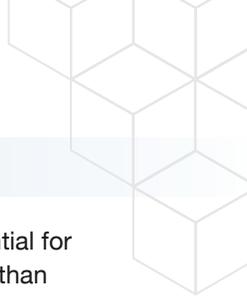
Research Scope

For this research project, we are focusing specifically on the administrative potential of AI—meaning the potential for AI to assist with tasks and workflows involved in the administration of the SNAP benefit to customers—rather than customer-facing applications. Some reasons for this scope boundary include:

- **Narrow Scope as a Strategic Starting Point:** This approach ensures that the complexities and nuances of AI integration can be thoroughly understood and addressed in a contained, risk-managed context before exploring broader implementation. This concentrated focus aids in identifying best practices, potential challenges, and effective strategies for scaling up future AI use.

- **Reduced Risks in Administrative Applications:** Early research indicates that administrative use cases of AI may present fewer risks compared to customer-facing applications. This is largely because professionals within the agency can actively monitor and evaluate the output quality of operational AI applications. Such oversight is crucial in the early stages of technology implementation, ensuring that the AI systems function as intended and align with agency objectives and standards.

- **AI as a Complement to Existing Processes:** AI technology, when implemented in administrative settings, can significantly streamline existing processes. This includes automating routine tasks, improving data accuracy, and enabling staff to focus on more customer-centered, complex, high-value activities. The aim is to create a synergy where AI supports human decision-making rather than replacing it, leading to more efficient and effective administrative operations.

- **Improving Customer Journey and Access to Benefits:** A core goal of integrating AI into SNAP case processing will be to facilitate a smoother, more efficient journey for customers through the application, enrollment, and recertification processes. By optimizing administrative procedures, AI can help ensure that individuals and families receive the benefits they are entitled to in a timely manner. This not only improves the customer experience but also enhances the overall effectiveness of the SNAP program in meeting its objectives.

Defining AI for Human Services

We launched this research by starting with an existing federal definition of AI as a foundational framework and common foundation ahead of examining the definition's relevance in the SNAP operational environment. The definition we started with came from the *U.S. Department of Human Services, Office of the Chief AI Officer September 2021 Trustworthy AI Playbook*, created in response to Executive Order 13960 "Promoting the Use of Trustworthy Artificial Intelligence in the Federal Government."[3] In the playbook, AI is defined as:

A solution or system that ...

...performs tasks under varying and unpredictable circumstances without significant human oversight, or can learn from experience and improve performance when exposed to data sets

...uses computer software, physical hardware, or other technology to solve tasks that require human-like perception, thinking, planning, learning, communication, or physical action

...thinks or acts like a human, including the use of cognitive architecture or neural networks (e.g., developed to mimic the underlying mechanisms of the human mind)

...relies on a set of techniques, including machine learning, to approximate a cognitive task

...is designed to act rationally by utilizing intelligent software or an embodied robot to achieve goals using perception, planning, reasoning, learning, communicating, decision-making, and acting

The research team hosted educational and peer-exchange spaces with human services practitioners where professionals unpacked this definition together to gain a deeper understanding of AI broadly and to begin grappling with how AI applies to their operations. This inclusive approach to engaging human services professionals helps to build consensus and support, and foster a sense of ownership among agencies, which is crucial for the successful adoption of AI solutions.

Our discussions uncovered discomfort with various aspects of the definition. Overall, while this is a robust overview of Artificial Intelligence, government agency staff expressed concerns. They include fears that the definition is too long, confusing, alienating, and vague to guide action by program administrators.

An updated definition was put forth by Executive Order 14110, defining AI as:

> *A machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments. Artificial intelligence systems use machine- and human-based inputs to perceive real and virtual environments; abstract such perceptions into models through analysis in an automated manner; and use model inference to formulate options for information or action.*

For this project, we will be using a simplified definition resulting from collaborative redrafting efforts with APHSA's membership of human services professionals prior to the issuance of the Executive Order:

> *Artificial Intelligence is a technology that applies reasoning, analysis, or learning to complete a task or achieve a goal without explicit rules for how to do so.*

This verbiage prioritizes accessibility over precision and comprehensiveness in pursuit of a more user-friendly and human-centered definition to act as a helpful complement to existing technical definitions. This adaptation seeks to equip members and practitioners with the language and terminology that is most common in human services practices so that they may gain confidence in discussing the topic and differentiating between AI and other advanced technology (a distinction that will be discussed later).
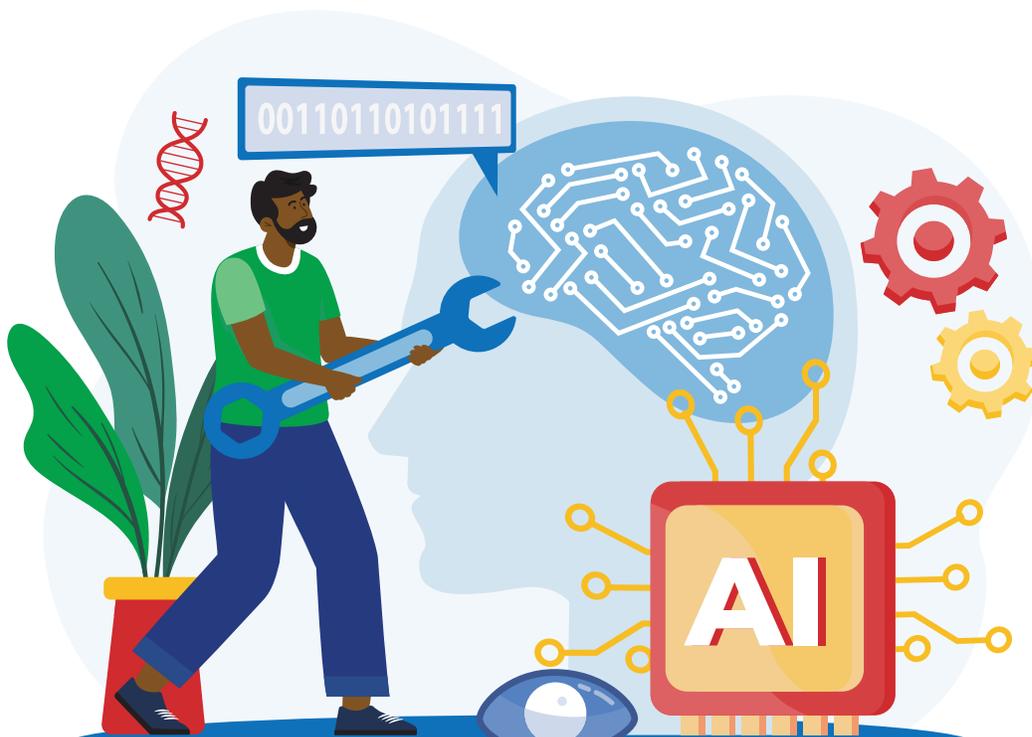
Definitions: Methods of AI

TYPES OF AI	DEFINITION	EXAMPLES
Machine Learning (ML)	A subfield of artificial intelligence that gives computers the ability to learn without explicitly being programmed.	Targeted ads Spam filters
Natural Language Processing (NLP)	Machines learn to understand natural language as spoken and written by humans.	Machine translation (e.g. Google Translate) Predictive text
Speech Recognition	Systems interpret human speech and translate it into text or commands.	Conversational IVR Virtual assistants (e.g. Siri, Alexa) Speech to text
Computer Vision, sometimes referred to as AI-enabled OCR (Optical Character Recognition)	Intelligent algorithms that perform visual perception tasks such as object recognition, scene categorization, integrative scene understanding, human motion recognition, and material recognition.	Visual translation Visual accessibility tools Identification of objects based on Machine Learning Interpretation of handwritten text
Intelligent Automation	The use of automation technologies to streamline and scale decision-making across organizations.	Customer Relationship Management HR onboarding & offboarding
Generative AI	A technology that can create content, including text, images, audio, or video, when prompted by a user.	Large Language Models (LLMs), (e.g. ChatGPT) Generative adversarial networks (e.g. Beautiful.ai)

Distinguishing Human Services' Approach to Leveraging AI

Public agencies can leverage AI as an innovative component of technical solutions, enabling effective, efficient service delivery. With proper guardrails, AI technology can bolster the impact of existing technology and enable more customer-centric ways for agencies to administer programs and supports to their communities. While considering whether AI might be the right choice for a given agency to support its processes, decision makers should carefully consider the AI application's impact on customer, staff, and end-user experience from its introduction into workflows and operations.

It is worth noting that there are many instances in which an application of AI might not be the most effective or feasible option to advance SNAP case processing goals. A change in process, such as eliminating steps, or more simplified technology, such as built-in business logic or simple automation, might be more appropriate. Robotic Process Automation (RPA) is one example of less complex technology that agencies can use to improve workflow, which has already been adopted in some states to support SNAP case processing.[4] One such example is Ohio's Quality Assurance Bot,[5] which identifies potential errors in earned income data entry (inconsistency in pay frequency or amount or invalid employment records). The bot then compiles these instances and generates a report that is sent to the county for review. Another use case is New Mexico's UpdateBOT, which allows customers to update the address or authorized representative listed on their case via chatbot.[6]

Distinguishing Features: Automation, RPA, AI

| Category	Differentiation	Examples
Automation	Rules-based, "hard coded" into systems	Systems benefits calculation, dynamically generating notices, "batch jobs"
RPA	Automating repetitive human tasks on a computer, often low/no code, often "doing the clicks for someone"	Categorizing returned mail and queuing for action
AI	Applies reasoning / analysis / learning to do a task / achieve a goal without explicit rules for how	Inferring a document type from its text, flagging cases that "look" to have problems (based on past data / attributes)

We hope that defining AI and detailing distinctions between AI and other advanced technology solutions will empower readers to make the decisions most appropriate to address their needs.

Current AI Use Cases

In the discovery phase of this research project, the team conducted desk research and engaged a wide range of human service practitioners and partners to uncover current uses of AI in SNAP. These activities uncovered that in SNAP case processing, established AI use cases (following the definition above) are minimal, though some agencies are researching and proposing options. Agencies are leveraging Robotic Process Automation and Bot technologies to streamline workflow processes, but these uses fall in the "Automation" and "RPA" categories of the table above—most notably because they do not use Machine Learning.

To explore the application of AI for SNAP case processing, we widened the scope of research to human services and related sectors by gathering information from members in, for example, the child welfare and labor spaces, and exploring innovation efforts led by various agencies at the federal level.[7] Use cases we chose to explore in depth, some of which are detailed in the following section, are those we found could be adapted to customer-centered delivery of SNAP—examples including those that might simplify document management, interpretation, and classification; improve data integrity; or streamline workflows.

Robotic Process Automation (RPA) Use Among SNAP State Agencies
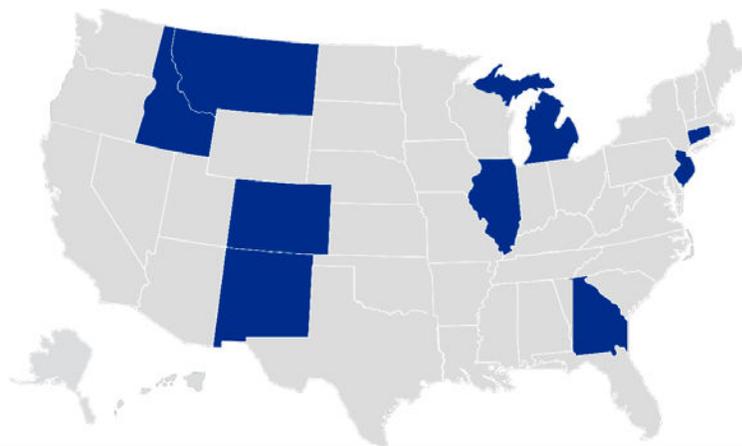
Source: U.S. Department of Agriculture, Food, and Nutrition Service, September 2023

Applications of AI Within SNAP Case Processing

In assessing the applicability of AI technology to processing SNAP cases, we unpacked the steps of the case-processing journey that are often most high-impact to the customer, time-intensive for staff, and potentially error-prone, such as documents and verifications, interviews, and eligibility determinations.

Member agencies have expressed a particular interest in workflow streamlining for documents and verifications with processes such as AI-enabled **optical character recognition** and **intelligent automation**. These technologies could allow documents to be read, understood, and appropriately categorized with necessary information extraction. An example of this might be viewing a paystub and extracting data such that it is tagged appropriately as earned income; accurately extracting information such as the amount, frequency, household member receiving income, and date; applying appropriate deductions and frequency calculations; then importing information into the eligibility system for worker review. This could similarly be applied to cases that are at risk of closure due to missing documentation as a second check. Functions of the Social Security Administrations Mobile Wage Reporting app[8] provide a model for this particular scenario, though it could be expanded to other forms of documentation, such as for identity proofing or medical expense documentation.

Natural language processing (particularly speech recognition) models show promise for supporting SNAP interviews or telephone applications by interpreting speech, extracting information from utterances, importing relevant details into eligibility systems, and generating case notes. This use case would be in service of addressing the common burden of time-intensive manual data-entry and note-taking to improve input accuracy and consistency across caseworkers. It would also decrease the time needed to manually input information while enabling caseworkers to instead confirm the accuracy of the inputs and spend more time speaking with the customer. This would draw from technologies currently in use or being explored within the child welfare sector, which uses natural language processing to support the generation of case notes (via speech-to-text) and for interpreting large volumes of narrative data to extract the most relevant information. An example of the latter is the Case Note Intelligent Search and Analysis Tool used by the Illinois Department of Children and Family Services.[9]

For a final example, a repeated topic has been that of generative AI, and, in particular, conversational **staff-supporting chatbots.** While rules-based chatbots (such as the New Mexico example above) can be developed to handle simple tasks or field straightforward questions by presenting a series of options or recognizing keywords, generative AI and machine learning could be leveraged to enhance bot technology in support of workers with questions surrounding specific cases, or to more quickly find relevant sections in large program or policy documents—to name just a few potential uses of AI-enabled chatbots.

Moving Forward

This publication is part of APHSA's AI-Powered SNAP Modernization project, through which we seek to explore AI in SNAP case processing and bring awareness to ways in which AI can enhance current processes; to provide information on pertinent statutory and regulatory considerations for SNAP agencies exploring AI; and to discuss implications around equity in AI with a customer-centered focus. This project aims to not only add to existing knowledge of AI in SNAP, but also to provide a foundation that local, state, and federal policymakers can use to inform their decisions and priorities. APHSA will remain engaged with the topic and lead conversations around AI in human services as they continue to unfold.

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The APHSA team appreciates the significant contribution of Dave Guarino, whose expertise in AI was instrumental in enhancing the depth and quality of this publication.

Endnotes

[1] The full text of the Executive Order can be viewed at https://www.federalregister.gov/d/2023-24283/.

[2] The proposed language of the memorandum can be viewed at https://www.whitehouse.gov/wp-content/uploads/2023/11/AI-in-Government-Memo-draft-for-public-review.pdf.

[3] For additional information, see the full Trustworthy AI Playbook at https://www.hhs.gov/sites/default/files/hhs-trustworthy-ai-playbook.pdf and Executive Order 12960 at https://www.federalregister.gov/documents/2020/12/08/2020-27065/promoting-the-use-of-trustworthy-artificial-intelligence-in-the-federal-government

[4] For a case study in 3 states leveraging RPA, see Wroblewska, K., et al. (2023) Analysis of robotic process automation in SNAP: Three case studies. This and related resources can be viewed at https://www.fns.usda.gov/research/snap/analysis-robotic-process-automation.

[5] For a report detailing Ohio's exploration in RPA, see https://www.nascio.org/wp-content/uploads/2022/08/OH_Emerging-and-Innovative-Technologies.pdf.

[6] Further detailed in Analysis of robotic process automation in SNAP: Three case studies.

[7] For inventories of current AI use cases at the federal level organized by agency, see https://ai.gov/ai-use-cases/.

[8] Details of this app can be found on the Social Security AI Use Case Inventory. A customer-facing guide to using the app is available at https://www.ssa.gov/MKWR-update/mwr-training-fy22.pdf.

[9] For more details on Illinois DCFS use of Natural Language Processing as a case notes solution, see https://dcfs.illinois.gov/content/dam/soi/en/web/dcfs/documents/about-us/reports-and-statistics/documents/apsr-fy24.pdf and https://www.govtech.com/computing/illinois-adopts-natural-language-processing-tech-for-child-welfare