

AI Use Case Name	AI Use Case Summary	Production Stage
Inventory Item Replenishment MLR Modeling POC - Phase 1a	<p>The Bureau of Engraving and Printing wanted to establish a proof of concept (POC) for Predictive Analytics at the BEP. This POC consisted of developing a Multiple Linear Regression (MLR) model to predict Processing Lead Times for the Office of Supply Chain Management (OSCM).</p> <p>Processing Lead Times are the numbers of days it takes an item to be delivered to the target facility from the time the purchase order (PO) was approved. The model utilizes historical requisition, vendor, and item specific data to come up with numerical predictions, which are then used to determine whether an item will be delivered on-time or if the OSCM should expect a delay. If a delay is expected, the OSCM can be proactive in their decision making to prepare for a potential inventory shortage.</p>	Development and Acquisition
Inventory Item Replenishment MLR Modeling Pilot - Phase 1b	<p>The Bureau of Engraving and Printing wanted to establish a proof of concept (POC) for Predictive Analytics at the BEP. This POC consisted of developing a Logistic Regression model for the Office of Supply Chain Management (OSCM), to predict whether an item would be delivered by the specified "Need by Date". This is the date that the BEP needs the material in its facility and is set automatically to 128 days when a purchase order (PO) is approved in the system. The model utilizes historical requisition, vendor, and item specific data to come up with binary (0 or 1) predictions, which are then used to determine whether an item will be delivered on-time or if the OSCM should expect a delay. If the model outputs a 1, we expect that the item will be delayed and the OSCM can be proactive in their decision making to prepare for a potential inventory shortage.</p>	Development and Acquisition

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Inventory Item Replenishment MLR Modeling POC - Phase 2	The Bureau of Engraving and Printing wanted to operationalize a model using their newly deployed Cloudera Data Science Workbench (CDSW) application to predict whether an item would be delivered by the vendor Promised Date. This date is the date the vendor promises an item to be delivered to BEP. The model utilizes historical requisition, vendor, and item specific data to come up with binary (0 or 1) predictions, which are then used to determine whether an item will be delivered on-time or if the OSCM should expect a delay. If the model outputs a 1, we expect that the item will be delayed and the OSCM can be proactive in their decision making to prepare for a potential inventory shortage.	Development and Acquisition
Collection Chat Bot	The Natural Language Understanding (NLU) model will be located inside the eGain intent engine. This NLU will take customer typed text input aka – Utterances. It will map the utterance to a specific intent and return the appropriate knowledge article.	In production: less than six months
Collection Voice Bot	The Nuance Natural Language Understanding (NLU) model will be located inside the Automated Collections IVR (ACI) main menu. This NLU will take customer speech input aka – Utterances. It will map the utterance to a specific intent and direct the taxpayer down to a certain call path.	In production: less than six months
DATA Act	The Digital Accountability and Transparency Act (DATA) Act Bot automates verifying that IRS Federal Procurement Data System (FPDS) reporting matches the information in contract documents (e.g. dollar amounts, dates, location of work). Natural language processing is used to extract unstructured information from contract documents. F1 scores are used to measure performance of validation models for each specific data element.	Planned (not in production)
NRP Redesign	Deploy state-of-the-art AI machine learning methods to provide a lower opportunity cost method of estimating a compliance baseline to support tax gap estimation, improper payments reporting, development and validation of workload identification and selection models, and inform policy analysis. System inputs require existing NRP data which provide an acceptable level of precision and quality for an acceptable level of data quality output.	In production: less than one year

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TAS Virtual Assistant	The TAS Virtual Assistant Chatbot will capture utterances from taxpayers/end-users to direct them to helpful resources on IRS and TAS public websites.	Initiation
Account Management Chatbot	The Accounts Management Chatbot leverages a natural language understanding model within the eGain intent engine. This NLU maps utterances to a specific intents, and returns the appropriate knowledge article.	Operation and Maintenance
Taxpayer Accessibility - Machine Translation (MT)	Taxpayer Accessibility Machine Translation (MT) is a SaaS based Commercial Off-the-Shelf (COTS) product that uses Amazon Translate, a neural machine translation (NMT) service. The MT solution implements customization features in the product which will have capabilities to integrate existing Linguistics Policies Tools and Services (LPTS) translations and workflows through a centralized repository formed by a collection of existing and customized IRS glossaries to return translations from English to Spanish (and Spanish to English) that more accurately reflect native-tongue verbiage.	Implementation
CX Analytics	IRS' Customer Experience (CX) Analytics is a capability that uses multiple, customer service-related data sources to identify issues/anomalies/improvement opportunities across the customer service channel modes.	Implementation

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Appeals Case Memorandum	The Appeals Case Memorandum (ACM) leverages natural language processing capabilities to assist with extraction, consolidation, and labeling of unstructured text from IRS ACM documents, automatic identification of key information, and processing results into a structured format. The outcome of this processes is for IRS staff to review appeals information for insights, which can be used upstream to enhance case quality, consistency, and performance. Summary of results involve detailed analysis on text relationships, issues, and citation narrative text paragraphs to provide insight on issues commonly adjusted during the appeals process.	Implementation
Coin quality inspection system	Automated coin visual inspection tools to search for defects on production lines. Currently each coining press operator manually inspects coins for quality. Improve quality and eliminate waste. Researching feasibility and tools.	Initiation
Predictive equipment maintenance system	Predictive maintenance to increase equipment uptime, improve safety, lower maintenance cost. Researching feasibility and tools.	Initiation