Artificial Intelligence Use Case Inventory

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One of the key benefits to managing and utilizing data more efficiently is that it enables the use of advanced capabilities such as artificial intelligence (AI) and machine learning (ML). The Department of Labor has recently begun exploration of how these advanced technologies can be used to benefit the agency and help deliver on our mission. In an effort to create transparency in the adoption of these tools, this page serves to highlight the various uses of AI across the department.

Active AI Use Cases

Use Case Name	What is the Intended Purpose and Expected Benefits of the AI System?	Stage of Development
Form Recognition Model for Benefits Forms	Custom machine learning model to extract data from complex forms to tag data entries to field headers. The input is a document or scanned image of the form, and the output is a JSON response with key/value pairs extracted by running the form against the custom trained form recognition model.	Operation and Maintenance
Language Translation	To automatically translate unofficial documents into various languages quickly and easily, without the time and expense needed for human translation.	Initiated
Audio Transcription	Transcription of speech to text for records keeping using natural language processing models.	Operation and Maintenance
Text to Speech Conversion	Text to speech (Neural) for more realistic human sounding applications using natural language processing models.	Operation and Maintenance
Claims Document Processing	To identify if physician's note contains causal language by training custom natural language processing models.	Retired
Website Chatbot Assistant	The chatbot helps the end user with basic information about the program, information on who to contact, or seeking petition case status.	Operation and Maintenance
Data Ingestion of Payroll Forms	Custom machine learning model to extract data from complex forms to tag data entries to field headers. The input is a document or scanned image of the form, and the output is a JSON response with key/value pairs.	Retired
HoloLens	AI used to train Inspectors to visually inspect unsafe areas from a safe location.	Operation and Maintenance
DOL Intranet Website Chatbot Assistant	Conversational AI Assistant & DOL intranet websites to help answer common procurement questions, as well as specific contract questions.	Operation and Maintenance
Official Document Validation	AI detection of mismatched addresses and garbled text in official letters sent to benefits recipients.	Retired
Electronic Records Management	Meeting NARA metadata standards for (permanent) federal documents by using AI to identify data within the document, and also using NLP to classify and summarize documents.	Initiated
Call Recording Analysis	Automatic analysis of recorded calls made to Benefits Advisors in the DOL Interactive Voice Response (IVR) center. AI is not used for analysis; AI is used only for transcription.	Operation and Maintenance
Automatic Document Processing	Automatic processing of continuation of benefits form to extract pre-defined selection boxes. AI tool will extract data from the forms.	Operation and Maintenance
Automatic Data Processing Workflow with Form Recognizer	Automatic processing of current complex workflow to extract required data.	Acquisition and/or Development
Case Recording Summarization	Using an open-source large language model to summarize publicly available case recording documents which are void of personal identifiable information (PII) or any other sensitive information. This is not hosted in the DOL technical environment and is reviewed by human note takers.	Retired
OEWS Occupation Autocoder	The input is state submitted response files that include occupation title and sometimes job description of the surveyed units. The autocoder reads the job title and assigns up to two 6-digit Standard Occupational Classification (SOC) codes along with their probabilities as recommendations for human coders. Codes above a certain threshold are appended to the submitted response file and sent back to states to assist them with their SOC code assignment.	Operation and Maintenance
Scanner Data Product Classification	Classifies bulk data received from corporations into Entry Level Item (ELI) codes in the Consumer Price Index (CPI)	Operation and Maintenance

Consumer Expenditure Diary Autocoder	Assigns expense classification categories to reported expenses from Consumer Expenditure Diary Survey respondents	Operation and Maintenance
Generative AI Assistant	Private and secure in-house solution to evaluate business use cases that can solve problems using Generative AI models and semantic search. Example use cases include text summarization, text analysis, and document comparisons.	Operation and Maintenance
Occupation Code Suggestion for Job Duties Data	Suggest appropriate occupation code for job duties data using natural language processing and classification techniques.	Retired
Notice of Deficiency (NOD) Text Generation using Generative AI Model	Application of custom Generative AI model to create Notice of Deficiency (NOD) text based on the input data.	Initiated
PII Redaction	Using Amazon Web Services Personal Identifying Information scrubber for ITA text fields and Named Entity Recognition to remove additional names from the text fields.	Operation and Maintenance
Website Chatbot Assistant	The chatbot helps the end user with basic information about the Workforce Recruitment Program and information on who to contact.	Operation and Maintenance
Initial Determinations for Incoming Applications	AI tool to help perform initial analysis of the incoming 9141 and 9089 applications. Make initial determinations regarding whether issuance of a Request for Information is necessary. Create a standard RFI request and either (1) automatically issue the RFI before case assignment and hopefully obtain customer responses by the time the case is assigned OR (2) perform this action at case assignment and allow the assignment analyst to affirm and issue the RFI or not.	Initiated
AI Course Design Assistant	AI tool to recommend the structure of a course, titles for modules, descriptions, and images. AI-powered algorithms analyze course content and quickly generate test questions and prompts for authentic assessments. (Blackboard/COTS Product, unmodified)	Operation and Maintenance
Worker PLUS Microsimulation Program	The Worker PLUS model was developed as an evolutionary iteration of the Paid Family and Medical Leave. Simulator Model developed by Albelda and Clayton-Matthews (the ACM model).	Operation and Maintenance
Computer-Assisted Coding: SOII Autocoder	The Survey of Occupational Injuries and Illnesses (SOII) collects hundreds of thousands of narratives describing cases of work-related injury and illness annually. Using narratives and other relevant information, SOII Autocoder automatically assigns classifications for SOII elements, which include worker occupation, nature of the injury, part of body affected, event that resulted in the injury, source and secondary source (if it exists) that caused the injury. The use of SOII autocoder initially began in 2012 for review purposes, then gradually expanded to automatically assign these classification codes. In reference year (RY) 2022, 92% of all SOII elements were automatically coded, which were then subsequently validated by human staff. The SOII Autocoder is a transformer-based text classification model using millions of SOII cases as the labeled training data and a publicly available, third-party language model as a pre-trained base model. The Autocoder is trained annually in house using a GPU server that is owned and maintained by OCWC. Once trained, the Autocoder is deployed internally via REST API, autocoding batches of SOII and MSHA cases on a routine basis during the production cycle, all within the BLS network.	Operation and Maintenance
CFOI Record Matching	The Census of Fatal Occupational Injuries (CFOI) collects and publishes a complete count of work-related fatal injuries and descriptive data on their circumstances. The CFOI Record Matching programs matches records from various sources, including Occupational Safety and Health Administration (OSHA) Information System (OIS) files, news articles, and Quarterly Census of Employment and Wages (QCEW), to identify missing or inconsistent data in CFOI. The CFOI Record Matching programs use various aspects of AI in the areas of natural language processing and record matching. The CFOI-OIS matching uses random forest classifier model trained on previously matched CFOI-OIS data. The CFOI-QCEW matching uses TF-IDF vectors and cosine similarity to match establishment names in the CFOI-QCEW data. And the CFOI-CPDMS matching uses a publicly available, third-party question-answering language model to identify relevant CFOI elements from CPDMS data	Operation and Maintenance

	and then uses random forest classifier model to match CPDMS data to CFOI data. These processes are all conducted within the BLS network, and the outputs, in the form of spreadsheets, are provided once or twice a year to the staff in the CFOI program for review. These processes are all run within the BLS network.	
OIICS Coding	Auto-code assigning Occupational Injury and Illness Classification (OIICS).	Initiated
AI Assisted Coding - Microsoft GitHub Copilot	Automatically generate software code using Microsoft Copilot, this will reduce the time for generating code.	Operation and Maintenance
CPS OTC Prediction	The BLS productivity office publishes measures of hours worked by major sector and industry. As part of the calculation for this measure, BLS uses Current Employment Statistics (CES) data on hours paid is used to estimate hours for payroll workers. Additional adjustments are made to this measure, such as removing paid time off (PTO), adding off-the-clock (OTC) hours, and adding in hours worked by self-employed and unpaid family workers. BLS uses the Current Population Survey (CPS) dataset to identify the amount of hours that are worked off-the-clock (OTC) by workers. There are some workers in the CPS dataset that do not report whether their time off was paid, or whether they get paid hourly or not. This data needs to be imputed to calculate the ratio of total hours worked to paid hours worked. A random forest model is used to predict the responses for workers that did not report this information by training it on characteristics (such as industry, occupation, education level, age, etc.) of respondents that have reported that information. The benefit of this AI use case is increased accuracy.	Operation and Maintenance
Sample Refinement: Frame API	BLS establishment-based surveys, such as the Survey of Occupational Injuries and Illnesses (SOII), the National Compensation Survey (NCS), and the Occupational Requirements Survey (ORS), use the Longitudinal Database (LDB) as the frame for their survey samples. For each of these programs, there is a significant time-lag between when the sample is drawn for a program and when data collection begins. A critical and time-consuming part of data collection is sample refinement: checking the latest Quarterly Census of Employment and Wages (QCEW) and LDB data to adjust for any changes to the sampled establishment during that time-lag. The QCEW/LDB Frame API allows fast retrieval of the latest QCEW/LDB data for a nationwide sample so that users can perform sample refinement more efficiently. The SOII program uses the Frame API to perform over 20 sample refinement comparison checks, which outputs a report for the data collectors. The Frame API uses TF-IDF vectors and cosine similarity to compare company names, mailing addresses, and unit descriptions between the survey sample and the latest QCEW/LDB data to determine what components may have changed. The Frame API also has the flexibility for the users to match records using other combinations of variables. These processes are all run within the BLS network.	Operation and Maintenance
Consumer Expenditure Interview Item Code Estimation	Recommends an expense classification categories for Consumer Expenditure Interview Survey expense responses	Operation and Maintenance
Consumer Expenditure Interview Survey Imputations	Imputes missing expenditure values in the Consumer Expenditure Interview Survey when respondents answer “don’t know” or refuse to provide an expense amount	Operation and Maintenance
Note Taking Bot	The bot will take the transcript and summarize the meeting notes.	Initiated

In response to Executive Order 13960: Promoting the Use of Trustworthy Artificial Intelligence in the Federal Government, the Department of Labor (DOL) has established this publicly available site to ensure compliance with the AI and ensure transparency with the public regarding the departments AI efforts.

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