HUD Data Analytics Post-Payment Claims Audit Prototype

Office of Housing - Office of Financial Services
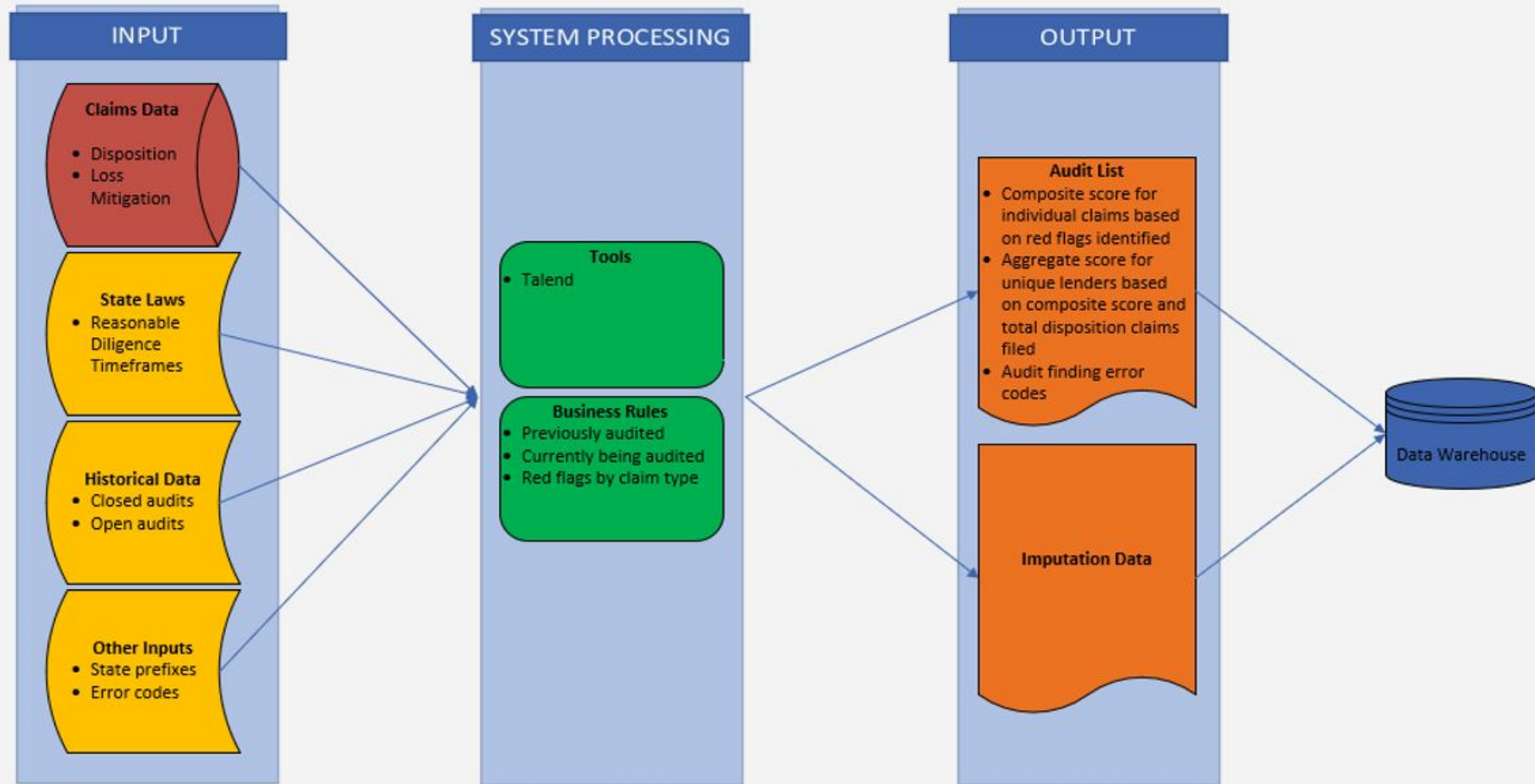3/15/2019

Prototype Overview

- Goal
  - Develop a model that can identify high-risk post-payment claims through a standardized approach that eliminates a significant amount of manual work, and also generates a higher percentage of true positives, thus reducing lost funding for HUD
- Benefits (not comprehensive)
  - Decrease in audit team's workload and labor hours by creating an efficient selection process with a more concentrated focus on higher-risk claims
  - Decrease in lost funding by augmenting the identification of improper claims payments to audit
  - More scientific-based approach to the audit identification process
  - Improved lender customer experience

Prototype Overview
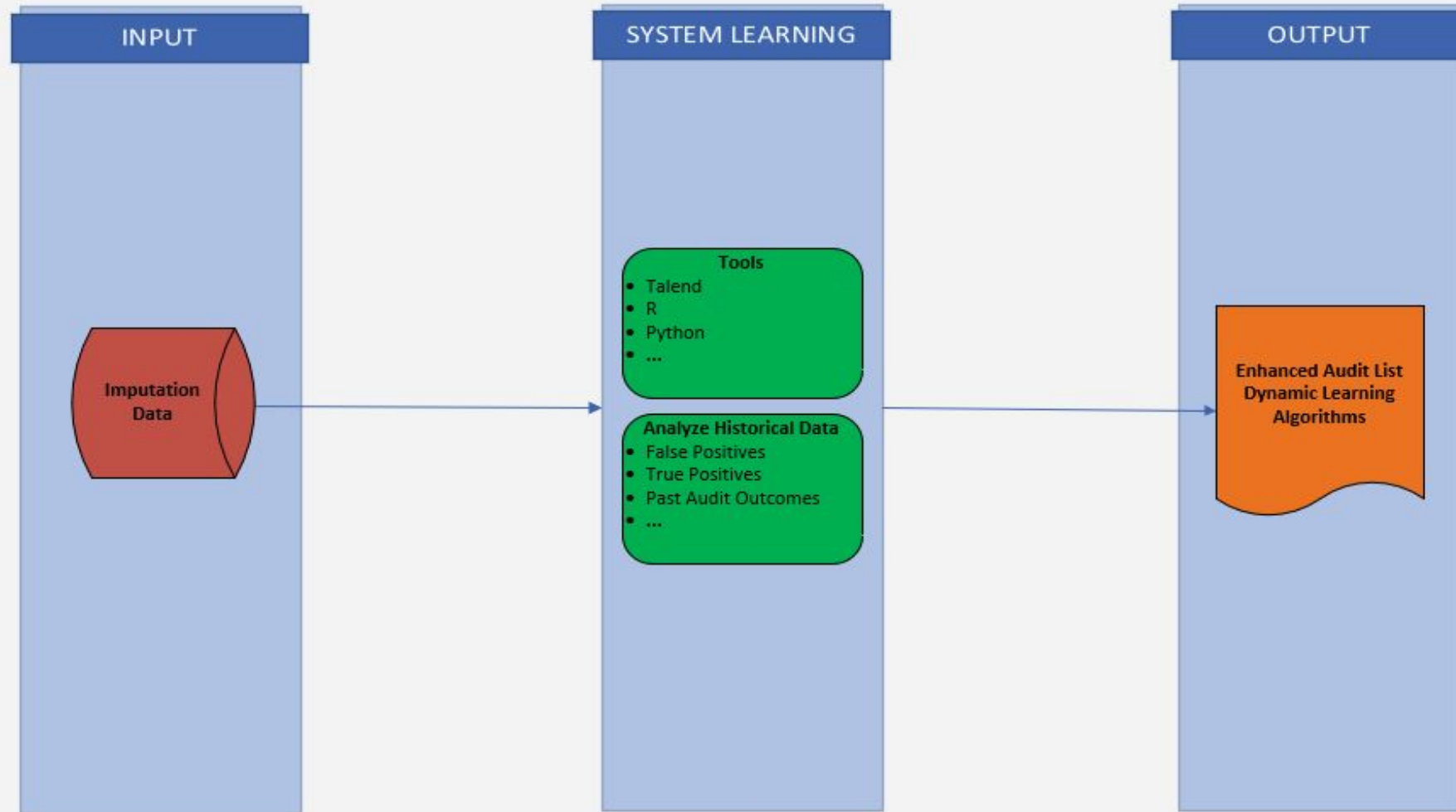
- Three-Staged Approach
  - Composite Scoring
  - Machine Learning/Artificial Intelligence
  - Semi-Supervised Processing
- Scope
  - Phase I CoE
    - Develop a composite scoring prototype
  - Phase II CoE
    - Build out and fully implement the prototype
    - Incorporate the machine learning/artificial intelligence component
    - Incorporate the semi-supervised processing component

STAGE 1: COMPOSITE SCORING

INPUT

Claims Data
- Disposition
- Loss Mitigation

State Laws
- Reasonable Diligence Timeframes

Historical Data
- Closed audits
- Open audits

Other Inputs
- State prefixes
- Error codes

SYSTEM PROCESSING

Tools
- Talend

Business Rules
- Previously audited
- Currently being audited
- Red flags by claim type

OUTPUT

Audit List
- Composite score for individual claims based on red flags identified
- Aggregate score for unique lenders based on composite score and total disposition claims filed
- Audit finding error codes

Imputation Data

Data Warehouse

Stage 2: Machine Learning/Artificial Intelligence

INPUT

Imputation Data

SYSTEM LEARNING

Tools
- Talend
- R
- Python
- ...

Analyze Historical Data
- False Positives
- True Positives
- Past Audit Outcomes
- ...

OUTPUT

Enhanced Audit List Dynamic Learning Algorithms

Stage 3: Semi-Supervised Processing

FEATURES

- Automated Database Updates
- Receive and Process Electronic Responses
- Send Audit Emails
- Optical Character Recognition
- Send Alerts and Notifications
- To be Determined