**Objective**

* Working demo that implements the following scenario:
  + Customs declaration submitted via EDI (xml file). The declaration refers to an X-ray image in the documents segment at the header level. The image itself is stored as a file with the file name equal to the document reference.
  + The declaration gets validated and registered.
  + The declaration goes through risk assessment:
    - Apply HS-8 classification model to goods description in every item, receive the predicted HS codes + the feature vector and insert into the item xml data;
    - Apply ‘region of interest’ detection model to the X-ray image and extract the image of the container;
    - Apply texture segmentation model to the container image, receive the number of identified segments and for each segment: volume estimation, homogeneity score and a texture sample;
    - Apply feature extraction model to every texture sample;
    - Save the segmented colour-coded image to the same folder as the original X-ray image file;
    - Compute probability (confidence score) that the X-ray texture corresponds to the goods description;
    - Insert into the item’s xml data:
      * Confidence score indicating how much the image correspond to the product description;
      * Homogeneity score for the texture;
      * Mass estimation for the item (for demo purposes: assume a standard fixed size of the container)
    - Apply risk rules:
      1. If there is a single predicted HS code with the level of confidence > 0.2 and it is not equal to the declared HS code, create “wrong HS code” finding for the item;
      2. If there are more than one predicted HS codes with the level of confidence > 0.2, create “vague description of goods” finding for the item;
      3. If there are no predicted HS code with the level of confidence > 0.2, create “unknown goods” finding for the item;
      4. If the confidence score for X-ray image is lower than 0.4, create “goods nature” finding for the item;
      5. If the homogeneity score for X-ray image is lower than 0.5, create “non-homogeneity” finding for the item;
      6. If the mass estimation is different from the declared mass for more than 20%, create “quantity” finding for the item;
      7. If there is a segment not corresponding to any item, create “undeclared goods” finding at the declaration header level.
    - If rule a, b or c is triggered, set declaration channel to yellow;
    - If rule d, e, f or g is triggered, set declaration channel to red;
  + If the declaration channel is green, the declaration is released by the system;
  + If the declaration channel is red or yellow the declaration moves into status “Under control”
  + User opens CLR21: Enter examination findings for a Customs declaration
    - The screen displays:
      * Declaration details
      * Findings
      * Button: display original and processed X-ray image
    - User selects examination results (compliant/not compliant) for every finding.
  + User can select one of the following actions:
    - Compliant: declaration is released by the system;
    - Not compliant: declaration moves to ‘Not compliant’ status.
  + There is no further processing for ‘Not compliant’ declarations in the demo.

* The demo is containerized and published to a container registry. From there, it can be automatically deployed to an on-premise environment or to Azure/Amazon cloud – for the period of the demo only. When the demo environment is not needed, it can be shut down or even deleted and then automatically re-created again.

**Assumptions in order to speed up and lower the cost**

* We will use the refactored CLR module that already implements the above scenario except risk assessment;
* As customs declaration, we will use H7 dataset which is already implemented (we can also add H2 or KRA dataset, but it needs an additional task for adjusting declaration screen template);
* We will use PostgreSQL/Tomcat, same as for refactoring;
* PMP is not part of the demo (we will not retrain the models during the demo).

**WBS**

The estimates are indicative (to be confirmed by developers during sprint planning), see sprint planning for resource allocation

* Specifications preparation (5MD Yaroslav Logachev, available from now till 11/07 and then from 30/07);
* Prepare HS classification models for integration (5MD Jeffrey Lupes, daily rate: 458 EUR, Atos NL, available from now till 11/07);
* Prepare X-ray image analysis models for integration (15MD Ioannis Bistinas, daily rate: 515 EUR, Atos NL, available in July);
* Manipulations with X-ray image files (3MD Gabriele, available in July);
* Containerization of Risk rules engine and configuration UI (5MD Ren Yi);
* Integration of risk assessment pipeline (10MD Gabriele);
* Adjusting Risk rules engine to support new data elements in the rules and setup of the risk rules defined in the scenario (10MD SEC Risk developer);
* Saving of findings (3MD Gabriele);
* Enter examination findings screen (5MD Lian Ruifeng);
* Saving of examination results (2MD Gabriele);
* Demo deployment (5MD Ren Yi).

**Sprints**

* Sprint 1 (2 weeks starting on the 6th of July as the latest)
  + YL – 5 days: specifications
  + Jeffrey Lupes – 5 days: HS classification models
  + Ioannis Bistinas – 10 days: image analysis models
  + Gabriele – 10 days: X-ray image files, integration of risk assessment pipeline
  + Ren Yi – 5 days: containerization of Risk
* Sprint 2 (2 weeks)
  + Ioannis Bistinas – 5 days: image analysis models
  + SEC Risk developer – 10 days: risk rules
  + Gabriele – 10 days: integration of risk assessment pipeline and risk rules
* Sprint 3 (2 weeks)
  + Lian Ruifeng – 5 days: findings screen
  + Gabriele – 10 days: declaration methods, coaching of Lian Ruifeng, support of Ren Yi
  + Ren Yi – 5 days: demo deployment