Lab Center – Hands-On Lab

Session 5749

Classify Your Sensitive Data Assets Automatically Using IBM Watson Knowledge Catalog





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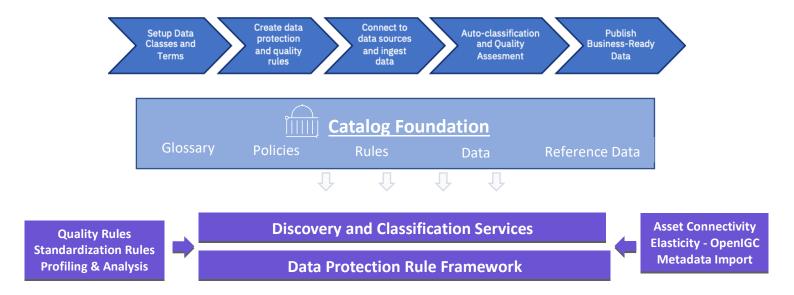


Introduction

IBM Watson Knowledge Catalog allows Data Citizens to search and explore meaningful, trusted and quality data; giving them insight and offering the ability to drive new analytics or support integration and data science.

First, we develop the foundational elements of the Catalog, Terms which give meaning to information; Classifiers for identifying information, including sensitive data; and Rules for enforcement of regulation and policies. Then, we ingest data into the Catalog, further enriching and preparing data through the available Discovery and Classification services and Metadata Curation experience. Discovery and Classification leverage the Machine Learning (ML) capabilities of the platform to automate the process to assign meaning and identity to data, identity sensitive data and application of data protection rules, and calculate the Quality score and dimension.

Ultimately, delivering business-ready-data to the Enterprise to facilitate the ability for the Data Citizen to search and explore meaningful, trusted and quality data with deeper insights and ability to advance Analytics and Data Science.



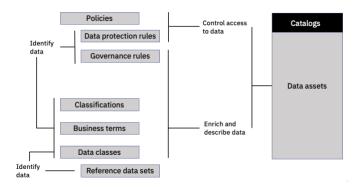


Getting Started

Governance is the process of curating, enriching, and controlling your data. You govern your data with governance artifacts.

You can create these types of governance artifacts:

- Classifications: You use classifications to describe the sensitivity of the data in data assets. Each data asset has one classification. Catalog collaborators assign the classification when they add data assets to a governed catalog. You can also assign classifications to governance artifacts, such as business terms, data classes, reference data, policies, and governance rules.
- Data classes: You use data classes to categorizes columns in relational data sets according to the
 type of the data and how the data is used. One data class is assigned to each column during profiling
 within a catalog. Catalog collaborators can change the data class assigned to a column. Users with
 the manage discovery permission can assign data classes to data set columns before adding the
 data to a catalog.
- Reference data sets: You create reference data sets to define values for specific types of columns.
 You can include a reference data set in the definition of a data class as part of the data matching
 criteria. During data profiling, if the values in a column match the reference data set and other
 criteria, that data class is assigned to the column. You can also use reference data sets in data
 quality analysis.
- **Business terms**: You create business terms to define business concepts in a standard way for your enterprise. Catalog collaborators can assign one or more terms to data assets and columns within relational data sets to describe the data. Users with the manage discovery permission can add business terms to data sets before adding them to a catalog.
- Policies: You create policies to describe how to govern data in catalogs. You can include data
 protection rules in policies to control access to data. You can also include governance rules in
 policies to describe data.
- Data protection rules: You create data protection rules to identify the data to control and to specify the method of control. Within data protection rules, you can include classifications, data classes, business terms, or tags to identify the data to control. You can choose to deny access to data or to mask sensitive data values.
- **Governance rules**: You create governance rules to provide a natural-language description of the criteria that are used to determine whether data assets are compliant with business objectives.



Above diagram shows an overview of how governance artifacts and governance tools work together to describe, enrich, improve, and protect data. Governance artifacts can have more relationships than are shown in this diagram with other artifacts and data assets.

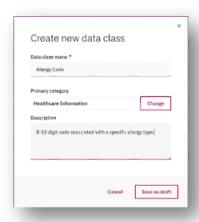


Catalog Foundation

1. Define a New Data Class

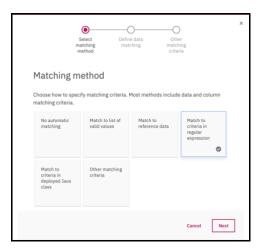
This step will allow the user to explore the process for creating a new Data Class to aide in the discovery and classification based upon the newly created Reference Data Set for Country Codes and Names

- 1 Open the navigation menu by selecting the action and expand the section Organize and further expand the section Data and AI Governance selecting the item Data Classes. This will open the Data Class view.
- 2 Here we can see a set of standard Data Classes that come pre-built in Cloud Pak for Data. We will be creating a new Data Class by selecting the action item *Create Data Class* to initiate the process to create a new Data Class. The create dialog will display.
- 3 Enter a name for the new Data Class Allergy Code < Your Name > and add a Description 8-10-digit code associated with specific allergy type. Select the Category Healthcare Information.



- 4 Click Save as Draft to complete the creation process. The draft copy of the Data Class appears.
- 5 Select and Edit the *Matching Method* to define the actions of the Data Class:







- a. Select the Matching Method Match to criteria in Regular Expression and click Next to continue.
- b. Enter (0-9)(8,10) as the match criteria and use 232347008 as the Test Value. Click Next.
- c. There are no Other Matching Criteria required. Click Save to complete the action.
- 6 Click *Publish* to publish the Data Class and complete the creation process.

This completes Step 2 and the creation of a Data Class



2. Import and Annotate Glossary Terms

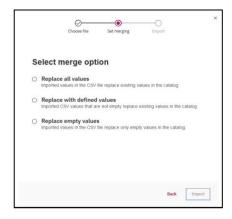
This step will allow the user to explore the process for creating a set of Glossary Terms with existing content, further annotating the created Terms

- 1 Open the navigation menu by selecting the action (from the upper-left corner of the navigation bar). Expand the section *Organize* and further expand the section *Data and AI Governance* selecting the item *Business Terms*.
- **2** Select the action item *Import* to initiate the import of a set of Glossary Term. The import wizard will display.
- 3 Click Add File to browse to the directory C:/THINK and select the provided file healthcare_terms.csv. The import file has previously been prepared for you and is a



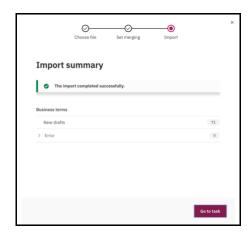
standard text delimited file that allows an author to easily author and import Terms into the Catalog. The format of the import file is documented <u>here</u>. Click *Next* to continue.

4 Select the Merge Option *Replace all Values*. This will replace any existing Glossary Terms with the imported Terms.

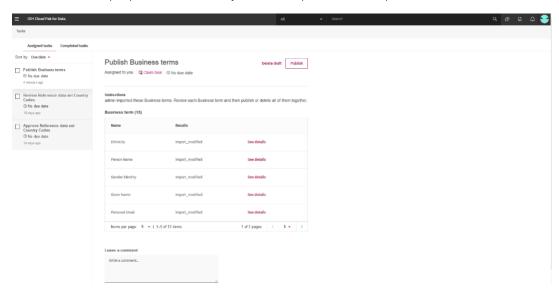


5 Click *Import* to continue and finalize the import action. Upon completion, a *Workflow* task is created to manage the reviewal and approval of the imported Terms into the Catalog.

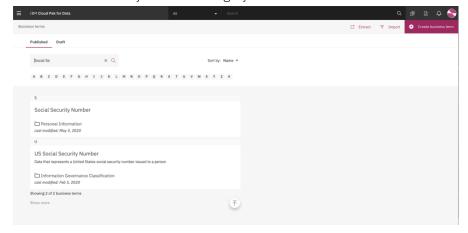




- **6** (Optional) Click *Go to Task* to open the created Workflow Task to publish changes. Note a single Workflow Task was created for the multiple Glossary Terms either created or modified in the Catalog.
 - --> STOP. For purposes of this Lab you will not publish the imported Terms. <--



7 Navigate back to the Business Term view from the menu on the upper-left *Organize* > *Data and AI Governance* > *Business terms*. In the search bar enter *Social Security Number*. Click on the term *Social Security Number* in the *Personal Information* category.



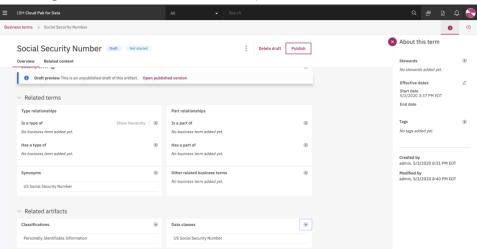




8 Scroll down to the *Related Terms* section and add a Synonym by clicking on the ⊕ action. In the window that comes up search for *Social security* and select the term *US Social Security Number* and click *Add*.



- **9** In the *Related Artifacts* section, we are going to classify this term as PII and relate it to a data class.
 - a. Add a Classification by clicking on the \oplus action. Select the *Personally Identifiable Information* classification and click *Add*.
 - **b.** Add a related Data Class by clicking on the ① action. Search for *Social Security* and select the class *US Social Security Number*. Click *Add*. This step will help with auto-classification of data as when an asset meets the data class definition it will also be assigned the business term.
- **10** Once all the changes have been made, *Publish* the updated term.



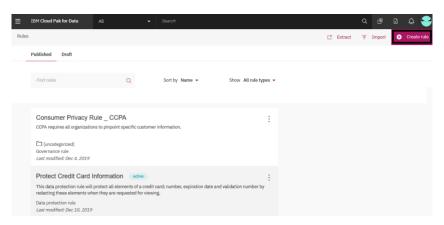
This completes Step 2 and the import and creation of Glossary Terms



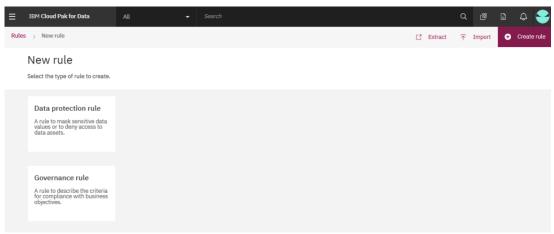
3. Create a Data Protection Rule

This step will allow the user to explore the process for creating a new Data Protection Rule for ensuring that sensitive or personal data is properly handled, and compliancy is met

1 Open the navigation menu by selecting the action and expand the section *Organize* and further expand the section *Data and AI Governance* selecting the item *Rules*.



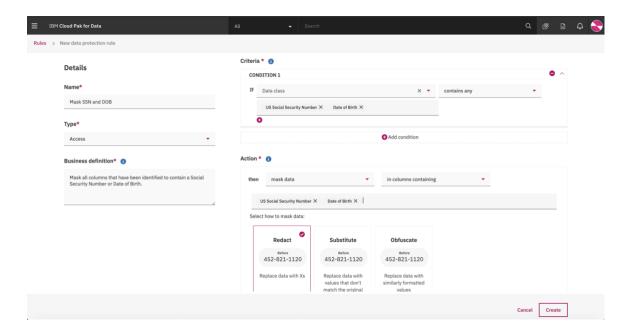
2 Select the action item Create Rule to initiate the process to create a new Governance Rule. The New



Rule selection type dialog will display.

- 3 Select Data Protection Rule to create a new rule of this type. The Rule create dialog will display.
- 4 Define the following information for the new Data Protection Rule:





- a. Set the Name of the Rule to Mask SSN and DOB < Your Name>
- **b.** Set the Business Definition of the Rule to Mask all columns that have been identified to contain a Social Security Number or Date of Birth.
- c. Using the Rule Builder, define a condition *If Data Class, US Social Security Number and Date of Birth, contains any*
- d. Using the Action Builder, define an action *Then Mask Data in Columns Containing US Social Security Number and Date of Birth.* Select the masking option of *Redact.*
- 5 Click *Create* to create the new Data Protection Rule. The Data Protection Rule is displayed for further modifications.
- 6 Click the return arrow to return to the list of Rules.

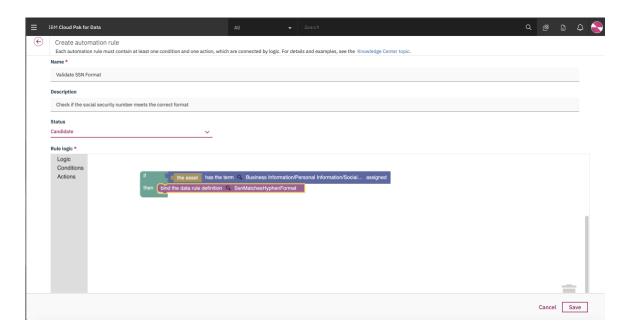
This completes Step 3 and the creation of a Data Protection Rule





4. Create an Automation Rule

- 1 Open the navigation menu by selecting the action (from the upper-left corner of the navigation bar). Expand the section *Organize* and further expand the section *Curation* selecting the item *Automation Rules*.
- **2** Click the *Create automation rule* button on the upper-right to open the rule builder.
- **3** Enter the rule name *Validate SSN Format < Your Name>* and the description *Check if the social security number meets the correct format.* Change the status to *Accepted*.
- **4** We will start building the rule using the rule builder dialog. This follows an If-Then logic **if** a certain condition is met **then** the action is taken.
 - a. IF: From the sidebar click on *Conditions* and drag over the *asset has term assigned* option and drop it by the if space. Next, click on the magnifying glass icon (\(\simega\)), search for and select the *Social Security Number* term. Click *Save*.
 - b. THEN: From the sidebar click on *Actions* and drag over the *bind the data rule* and drop it by the then space. Next, click on the magnifying glass icon (), search for and select the *SsnMatchesHyphenFormat* rule definition Click *Save*.



5 Click *Save* to create the new automation rule.

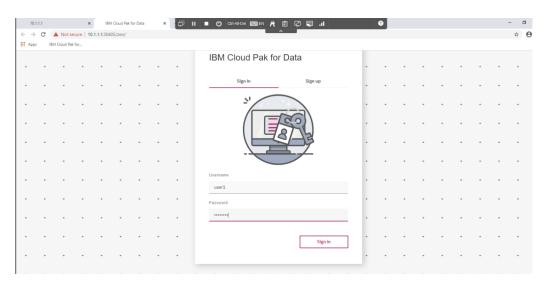


Data Discovery

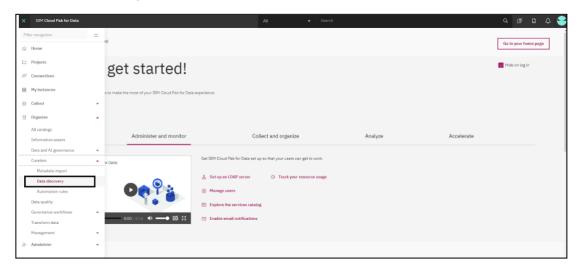
This step will allow the user to explore the process for initiating, reviewing and publishing the Data Discovery results

1. Setting up a Discovery Job

1 If not already logged-in, login Cloud Pak for Data using browser and your student ID and password

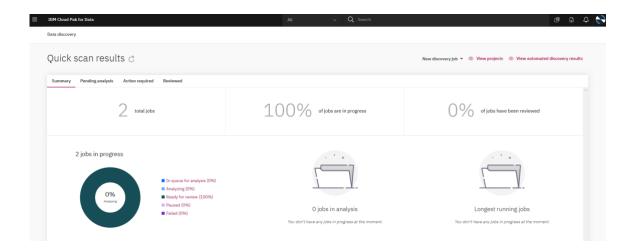


- 2 Open the navigation menu by selecting the action (from the upper-left corner of the navigation bar)
- **3** Expand the section *Organize* and further expand the section *Curation*

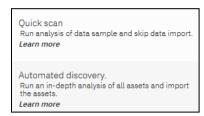




4 Select the item *Discovery*. This will open the *Data Discovery* view. The view includes a dashboard of current and ongoing Discovery jobs.



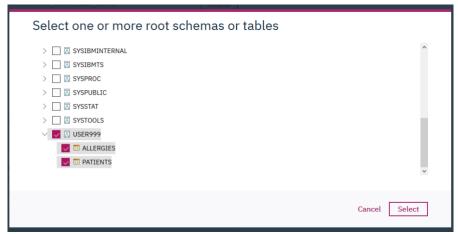
5 Expand the action item *New Discovery Job* to open the Discovery menu. Select *Automated Discovery* to initiate an in-depth analysis of a Data Set. The Automated Discovery Job dialog displays.



- **6** Click the action Select α Connection and then
 - a. From the list of available connections select DB2THINK2020



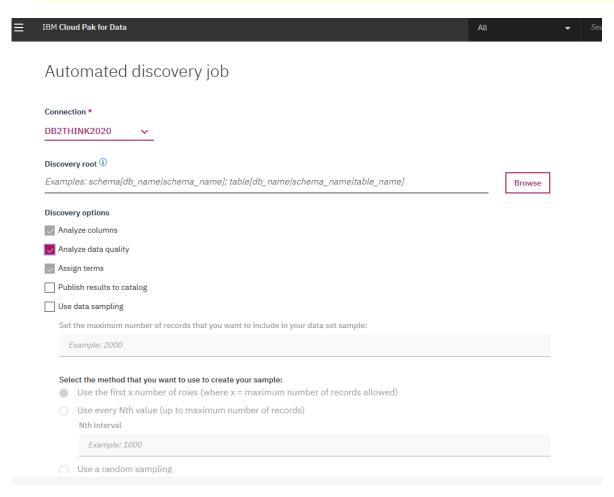
- 7 Click on *Browse* and expand BLUDB to show all schemas available to discover
 - a. Select USER999 schema and 2 tables as shown below and Click Select





- 8 This will bring back Discovery Job screen. Select the following Discovery Options:
 - a. Analyze Columns. Examine the characteristics and identify the matching Data Classes.
 - b. Analyze Data Quality. Calculate the Quality Score based upon the Quality Dimensions.
 - c. Assign Terms. Suggest and assign Business Terms.
 - d. Use Data Sampling. Set the Maximum Number of Records to 500
 - e. Do not select *Publish Results to Catalog*. The user will review and further annotate the Data Asset prior to publishing results to the Catalog.
- 9 Select the Workspace DataLakeWarehouse

STOP. Due to constraints, you will not be completing the analysis process and viewing the calculated results. Rather, you will be directed to review previous analysis results and take the same steps to publish the results.



10 Click the action *Cancel* to cancel the process and return to the previous screen.

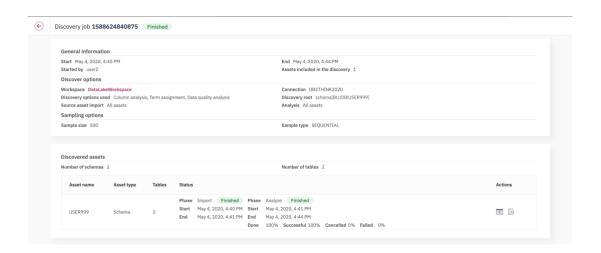


2. Review and Publish Discovery Job Results

1 From the menu, select the tab *View Automated Discovery Results*



2 From the list of previous results, identity the result for the Database Schema USER999 and click the *Discovery ID* to view its details



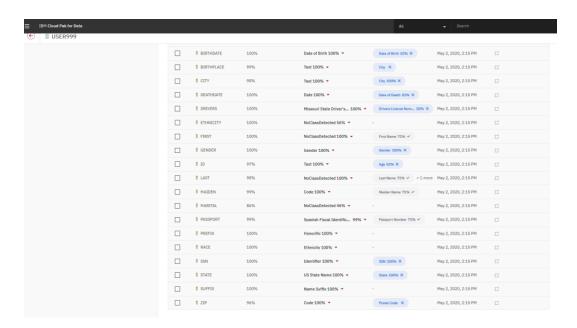
3 Click the action *Review Discovery Results* ot view the results for the Schema *USER999* and its included Tables.



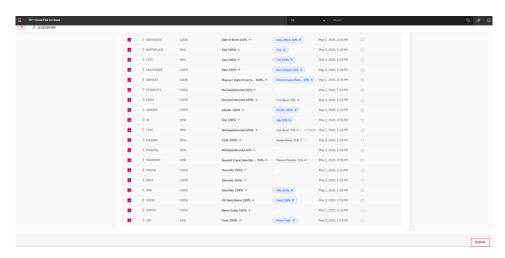




- **4** Expand the Table *Patient* and *Allergies* view the Quality Score, Data Class and Assigned Term of its columns.
 - a. For the column SSN, ADDRESS, ZIP review the Term Suggestion.



5 If not published, select all Tables and Columns by clicking the checkbox within the header section and click the action *Publish* to publish the Table and their Quality Score and assigned Data Class and Term to the Catalog. The Publish summary dialog appears.



6 Click *Submit* to complete the publication process. Click on the € icon on the top left to return to the job view. In the upper panel, click on the workspace name *DataLakeWorkspace* to go into the workspace.



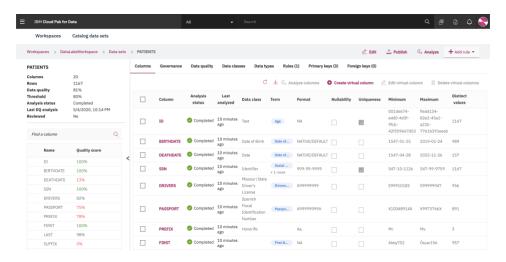




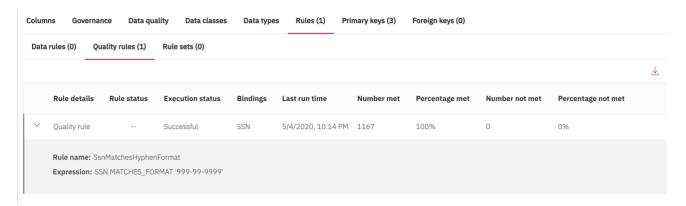
7 Once in the workspace, you a dashboard that gives you an overview of all the data contained in it. From the left panel click *View* next to *All data sets*. From the list of data sets click in the *PATIENTS* table to examine it further.



8 Here we can get a more detailed view of all the analysis done on the table. We can see all the Data Classes and Business Terms that have been automatically assigned to each column.



9 If we select the Rules tab and then the Quality Rules tab, we can see that the automation rule we created earlier to validate the format of a social security number has been automatically applied to the SSN column once it was assigned the business term Social Security Number. We can identify if any data points do not match the format.

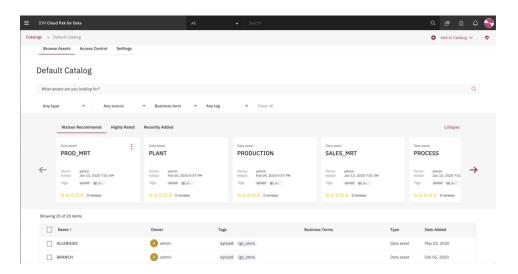




3. Search and Explore Discovered Assets

- 1 Optionally, open the navigation menu by selecting the action (from the upper-left corner of the navigation bar) and expand the section *Organize* and select the item *All Catalogs*. The list of Catalogs will display. Catalogs include a sub-set of Data Sets which specific users have been granted access to preview and access.
- 2 Select the catalog *Default Catalog*. The Catalog view will display.





3 Browse the list of items and select the Table **Patient**, this is the same Table previously imported and discovered. The Data Set preview is displayed.

