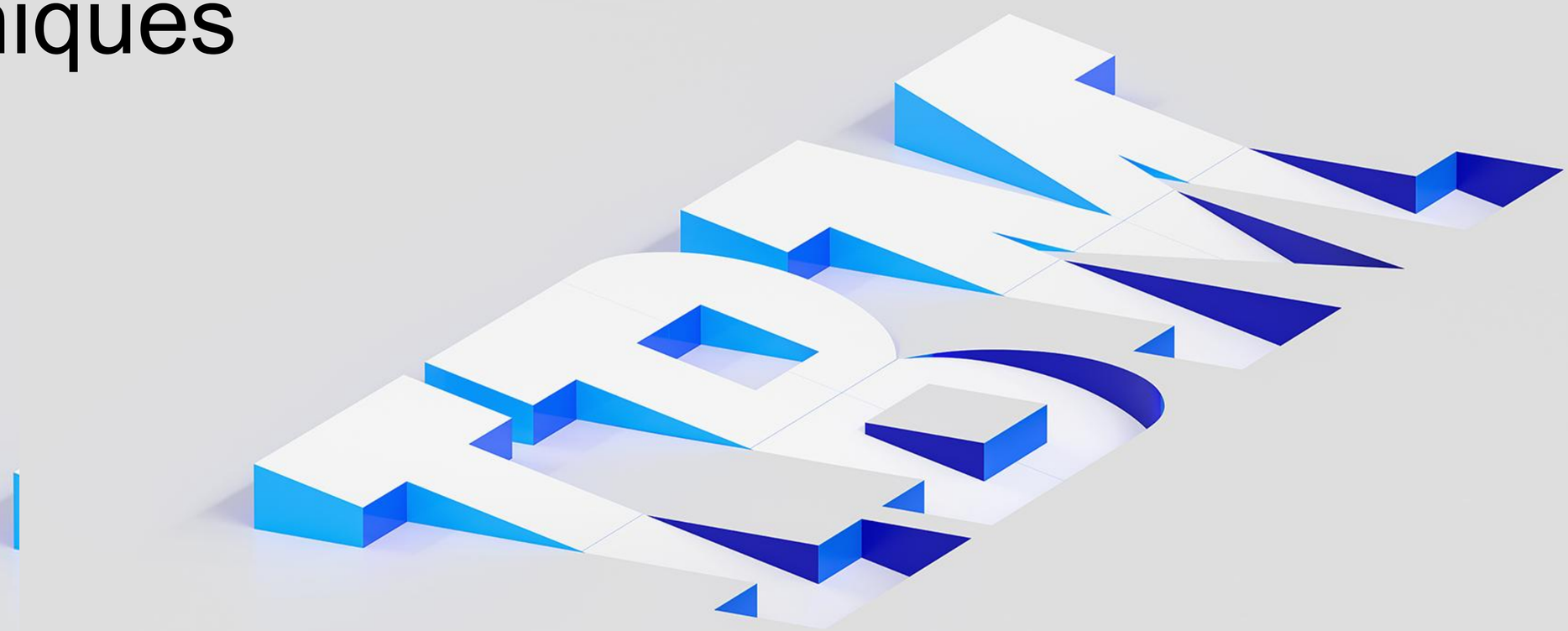
Module 3: integration techniques



Jesse Gorzinski
Senior Business Architect, IBM

Goal: We want to integrate AI into our IBM i workloads

The 4 layers of AI integration

Goal: We want to integrate AI into our IBM i workloads

Local AI Inference

- Run LLMs on Power hardware
- Run LLMs on IBM i

Embedded AI transactions

- AI SDK for for Db2 for i

```
values
dbsdk_v1.wx_generate('Hello
world');
```

Bridge IBM i data with AI stacks

- Mapepire, Agentic AI

Scale and govern enterprise AI

- watsonx

watsonx

Embedded AI Transactions

Today

- Watsonx, Ollama, OpenAI-Compatible support
- **Wallaroo**
- Manual Installation, basic usage

Soon...

- Other LLM providers
- Improved usage and support
- Better docs
- Integrations with other AI stacks

AI SDK for Db2 for i

https://github.com/IBM/AI-SDK-Db2-IBMi

Bridge IBM i data with AI stacks

Connect IBM i and the AI world.

What is Mapepire?

IBM i
continuous innovation
continuous integration

Welcome to Mapepire

A cloud-friendly IBM i database access layer, built with simplicity and performance in-mind.

Find out more →

Pick your client language ⓘ

Super easy to use way to access Db2 for i from any application

Java

node.js

python™

C#

php

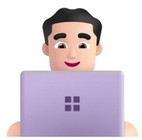
How does it work?

IBM i
continuous innovation
continuous integration

Connect to Database

Communication over secure web sockets

```
{
    "id": "id2",
    "type": "connect",
    "technique": "tcp",
    "application": "Java client"
}
```



Application

IBM i

Server Component

Application uses Mapepire client SDK

```
{
    "id": "id2",
    "job": "112480/QUSER/QZDASOINIT",
    "success": true
}
```

Managed using Service Commander

Mapepire AI Demo: Salary Insights Analyzer

This notebook demonstrates how to integrate **Mapepire** (IBM i database connector) with **AI** to analyze organizational data.

What This Demo Does

1. Connects to IBM i using Mapepire
2. Queries employee and department data
3. Uses Ollama (local AI) to analyze salary patterns and generate insights
4. Displays both raw data and AI-generated analysis

Prerequisites

- IBM i system with SAMPLE2 database tables (EMPLOYEE, DEPARTMENT)
- Ollama running locally with a model installed (e.g., `llama3.2`)
- Environment variables set: `IBMI_HOST`, `IBMI_USER`, `IBMI_PASSWORD`

Section 1: Setup and Imports

```python
import os
from dotenv import load_dotenv
import pandas as pd
from mapepire_python.client import SQLJob
from mapepire_python import connect
from mapepire_python.data_types import DaemonServer
import ollama

# Load environment variables from .env file (if present)
load_dotenv()

print("✓ All imports successful")
```

[ ]

Python

Scale and govern enterprise AI

watsonx

Leverage foundation models to automate data search, discovery, and linking in watsonx.data

watsonx.ai

Train, validate, tune and deploy AI models

watsonx.data

Scale AI workloads, for all your data, anywhere

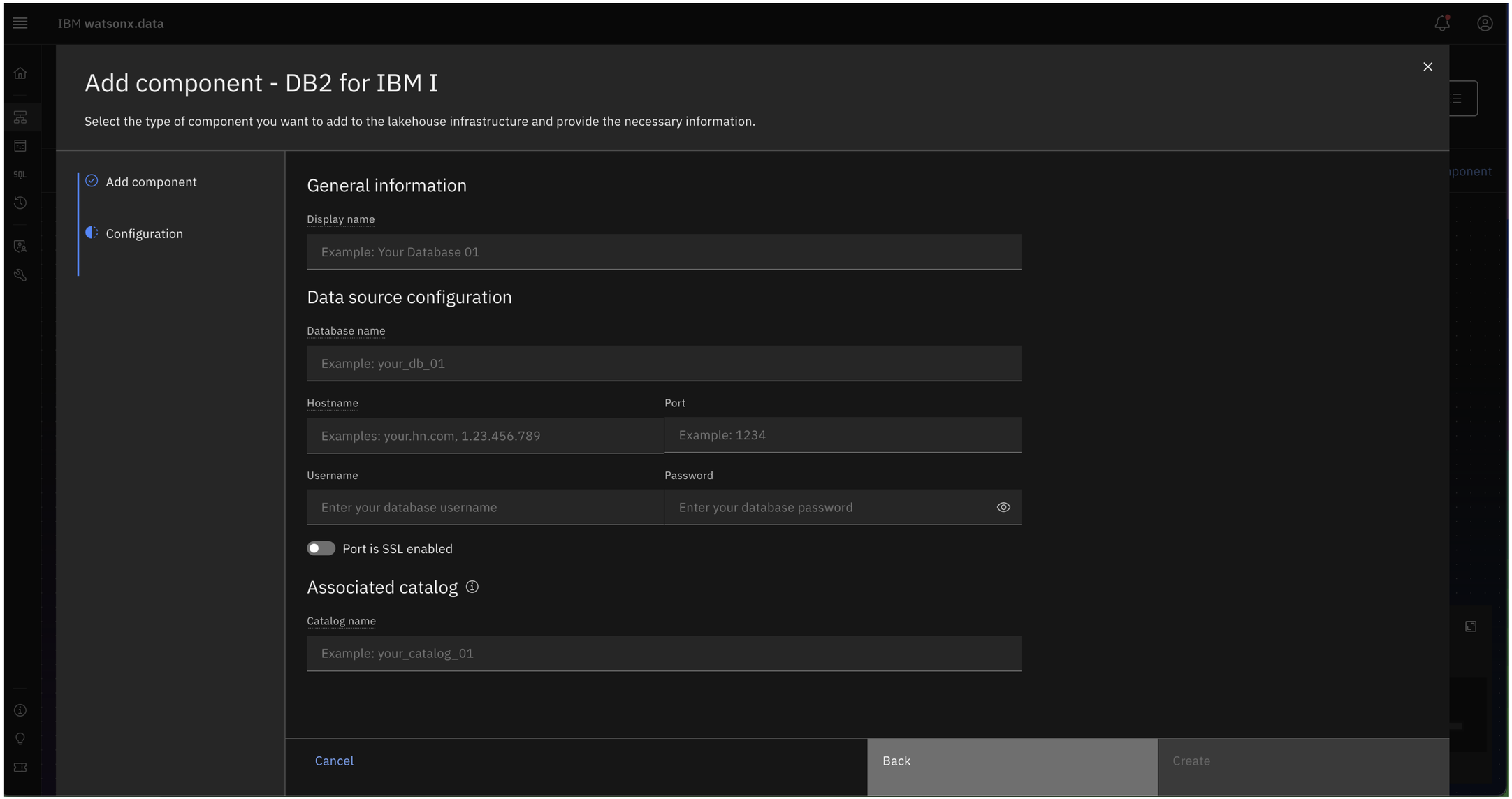
watsonx.governance

Enable responsible, transparent and explainable AI workloads

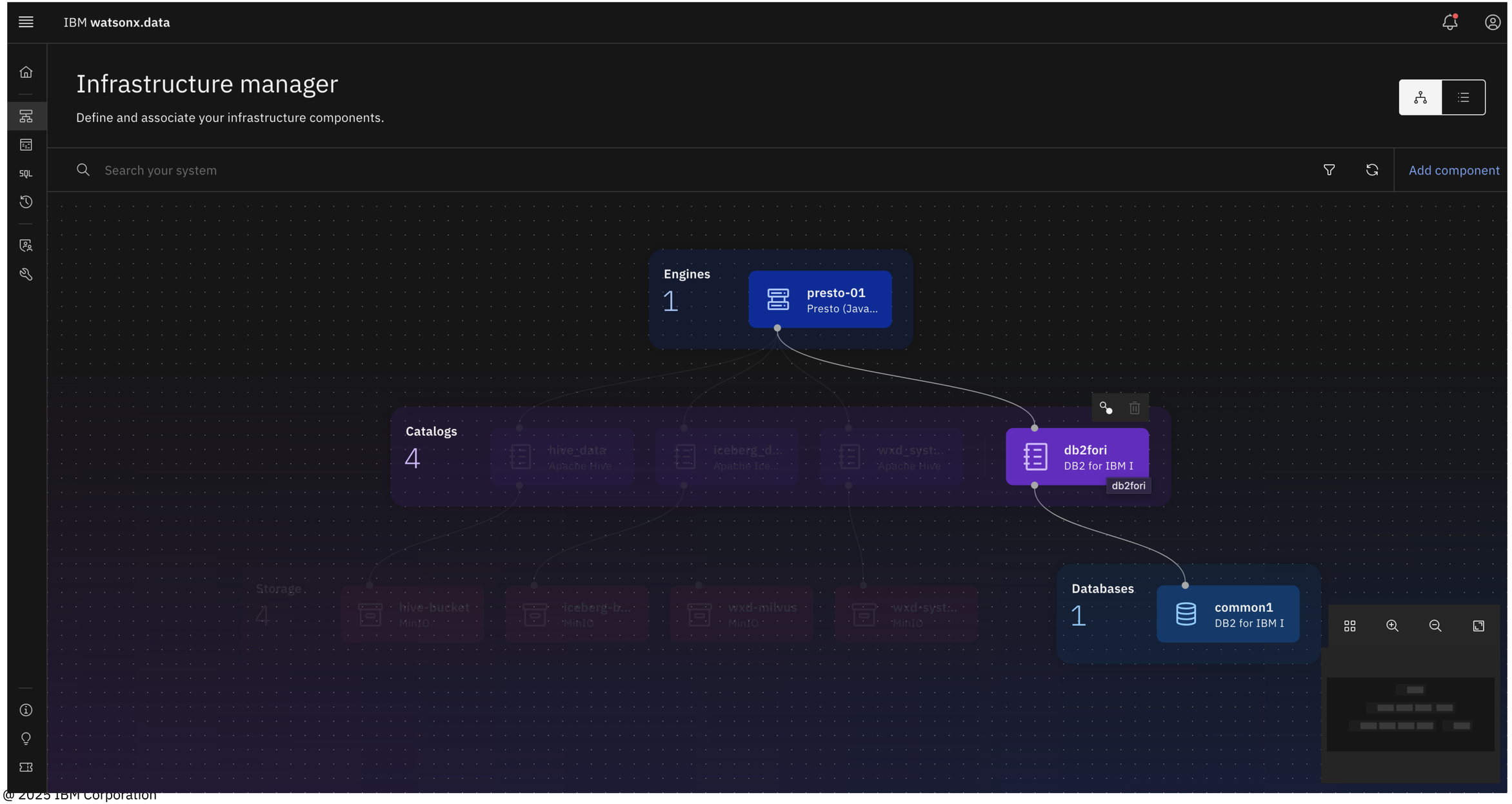
Leverage governed enterprise data in watsonx.data to seamlessly train or fine-tune foundation models

Direct, manage and monitor activities across the AI lifecycle, meeting risk and regulatory requirements with watsonx.governance

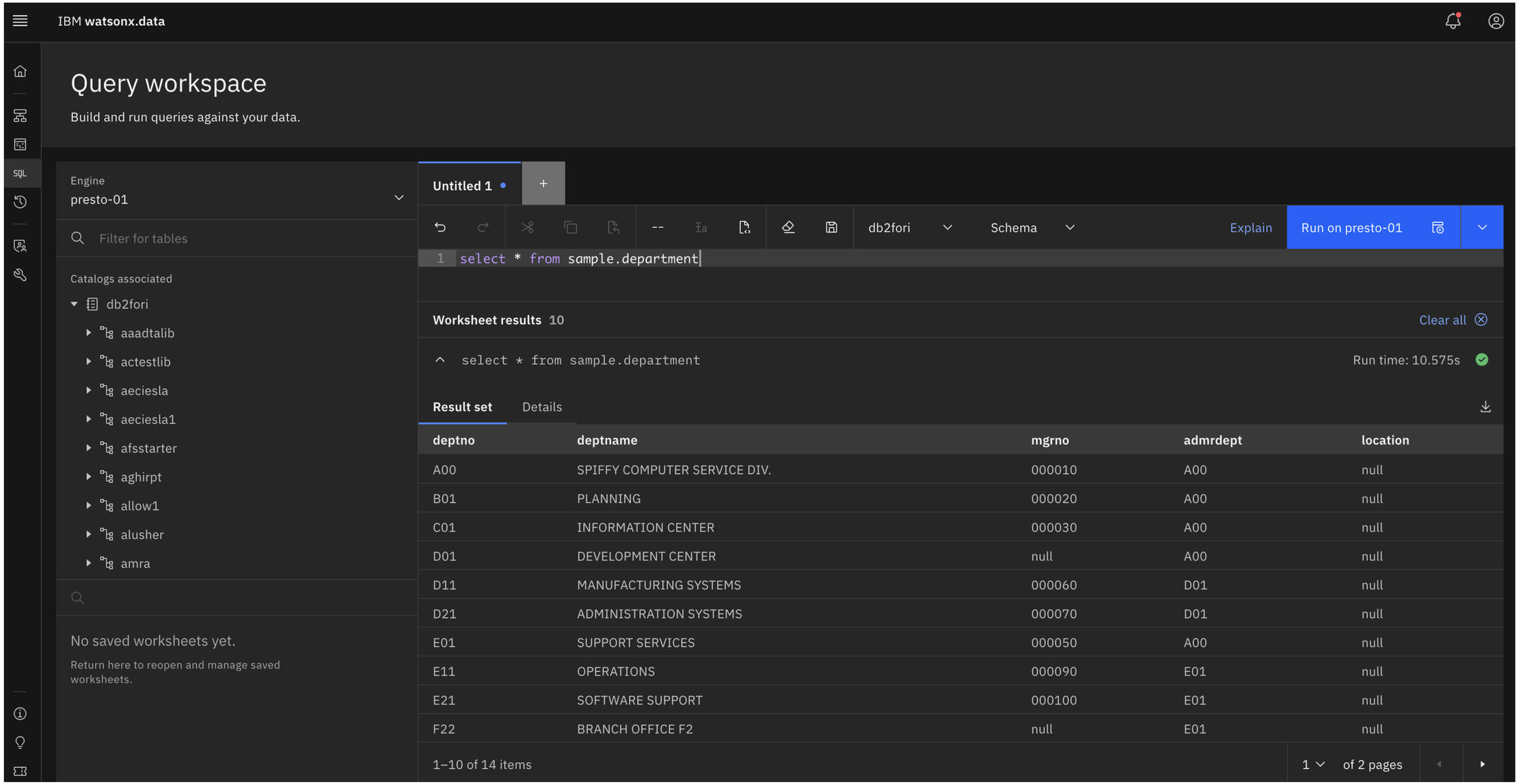
watsonx.data



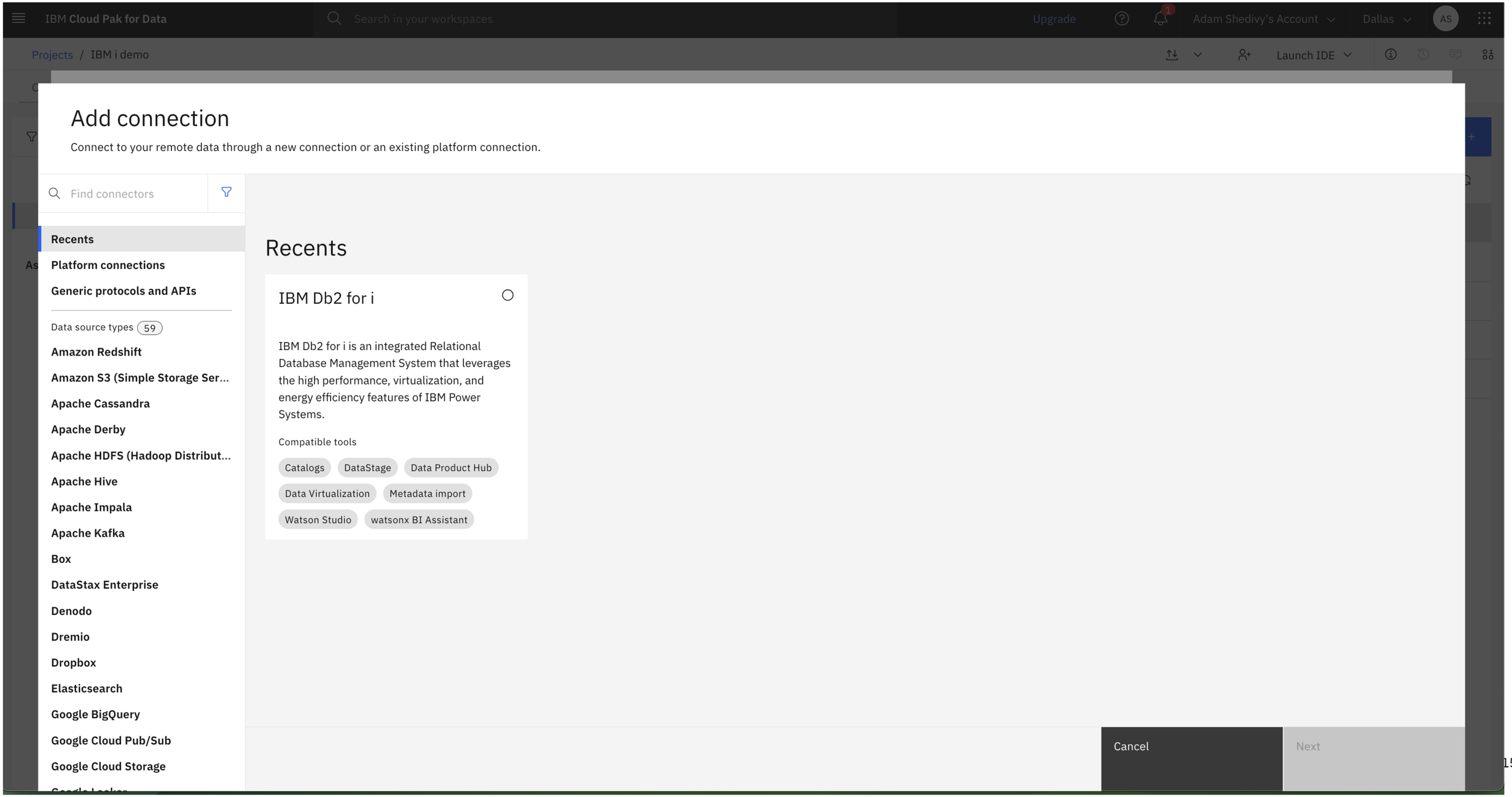
watsonx.data



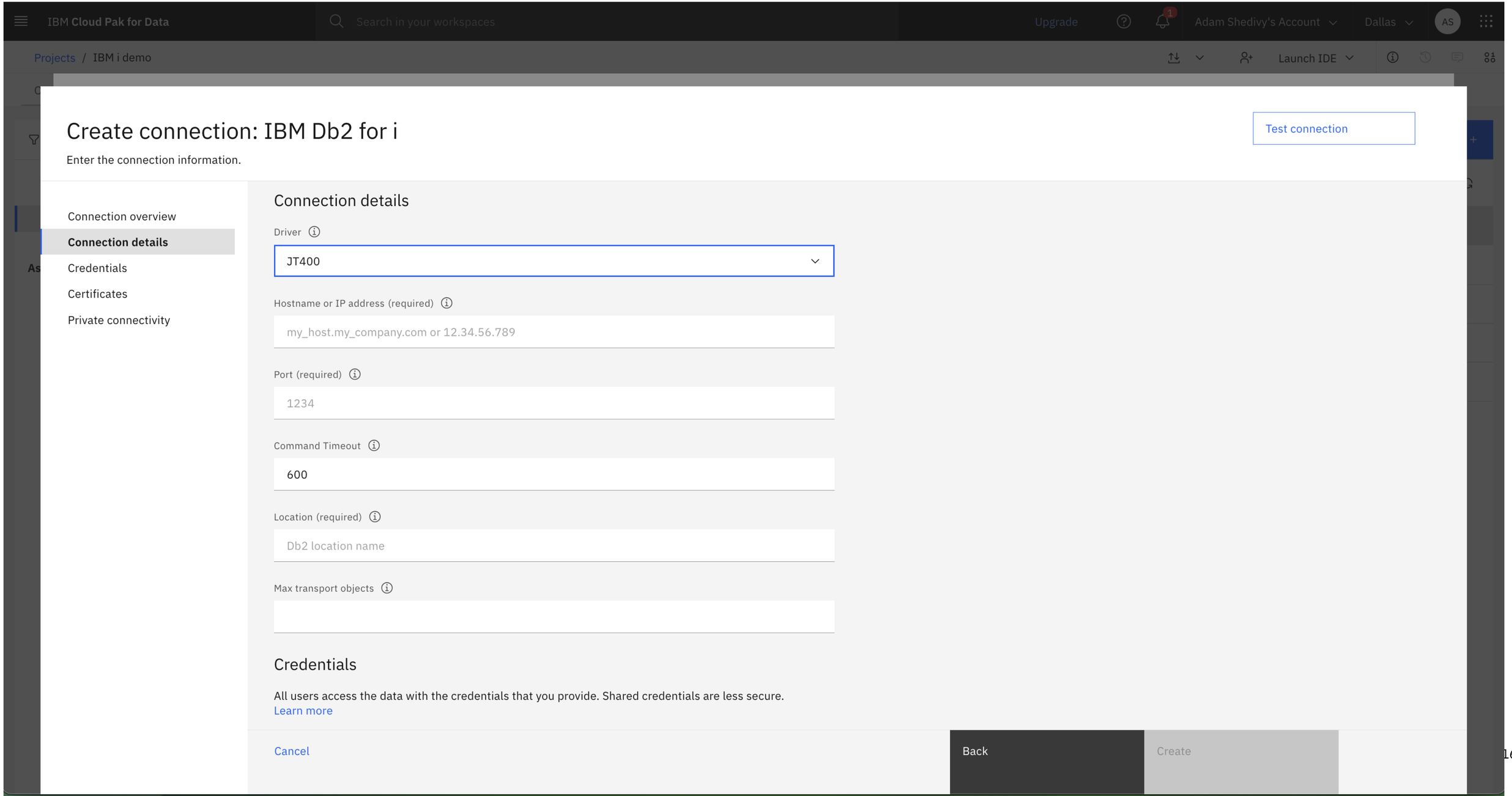
watsonx.data



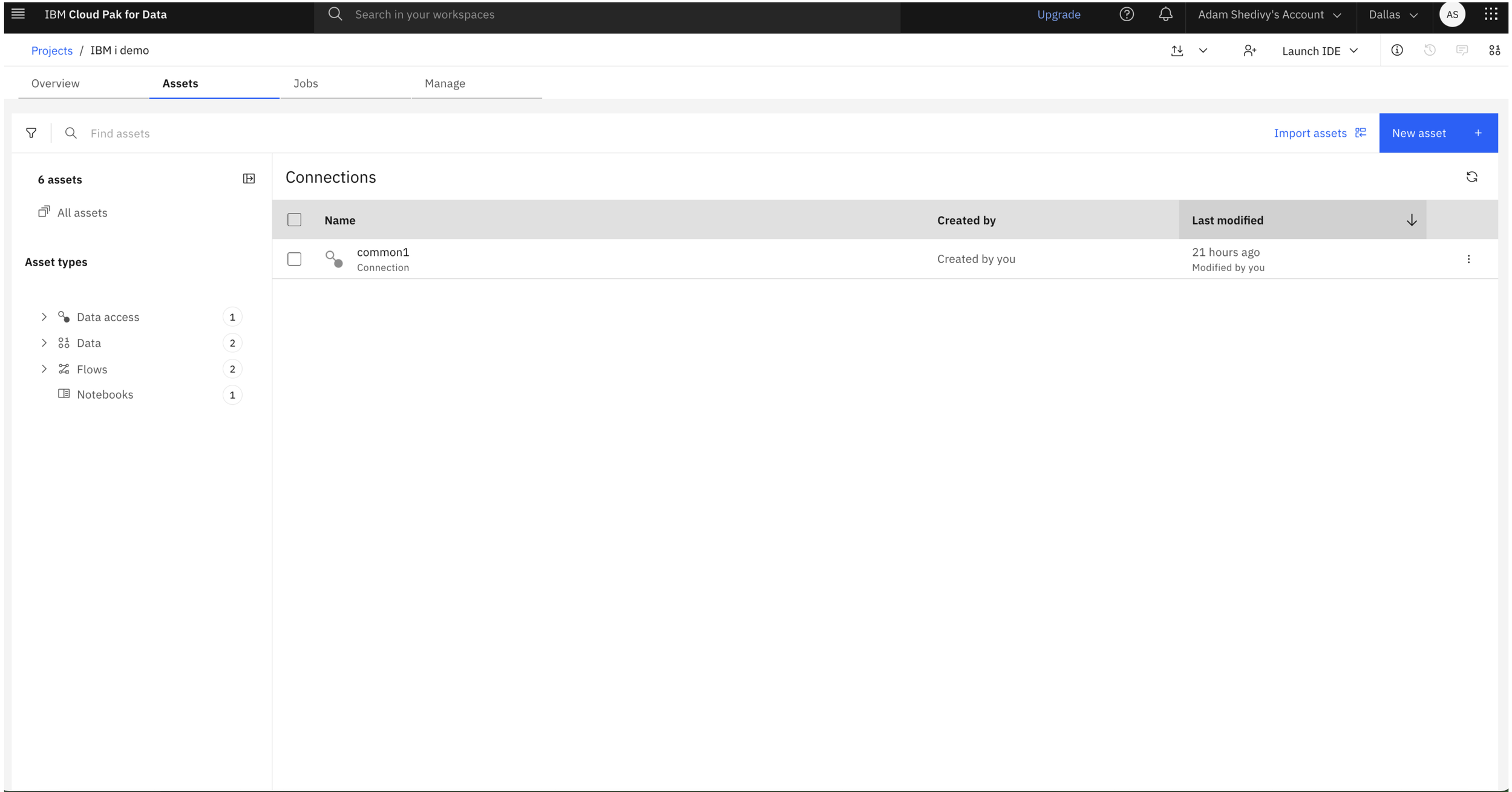
watsonx.ai: add IBM i connection



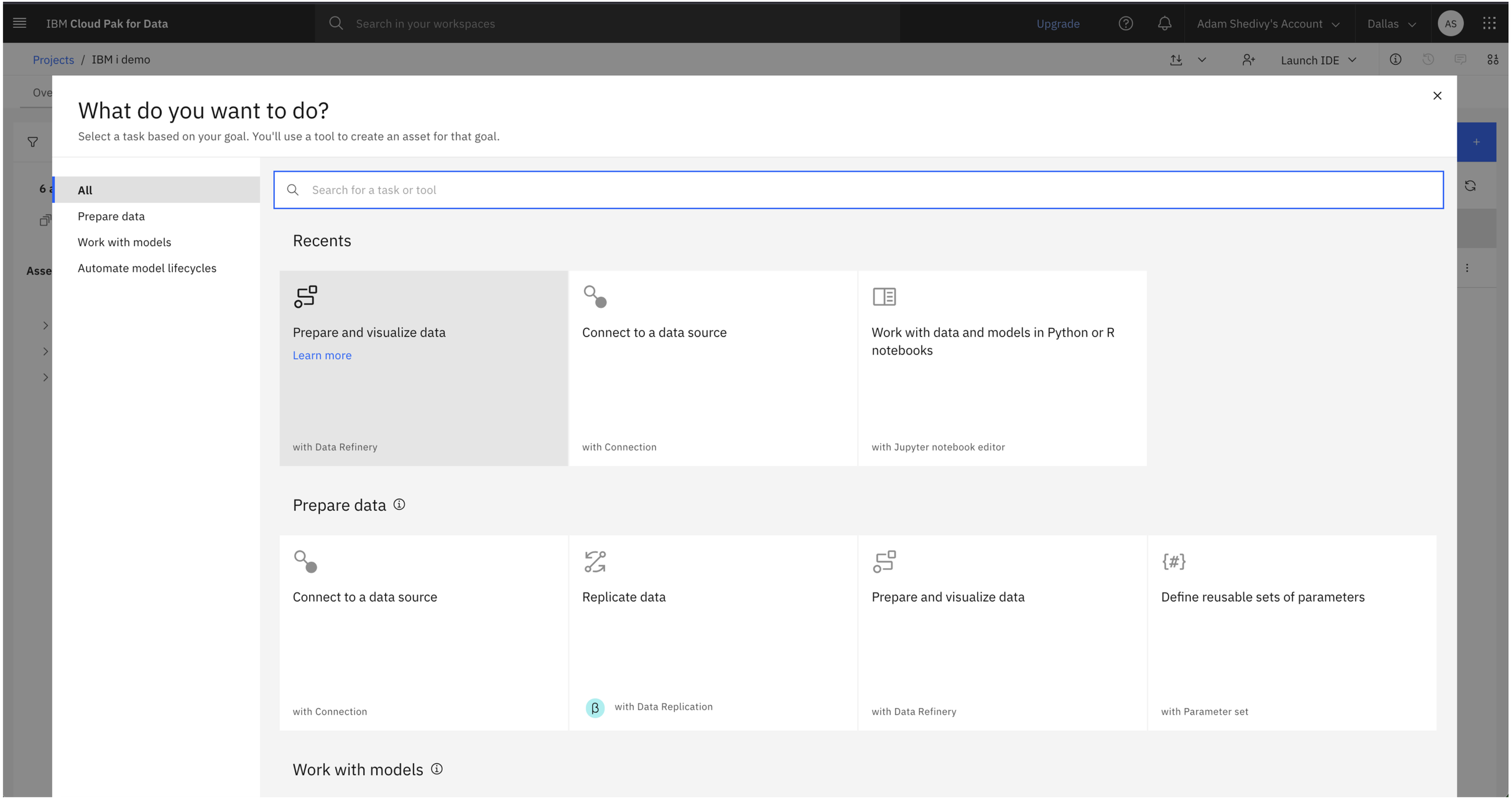
watsonx.ai: fill in credentials



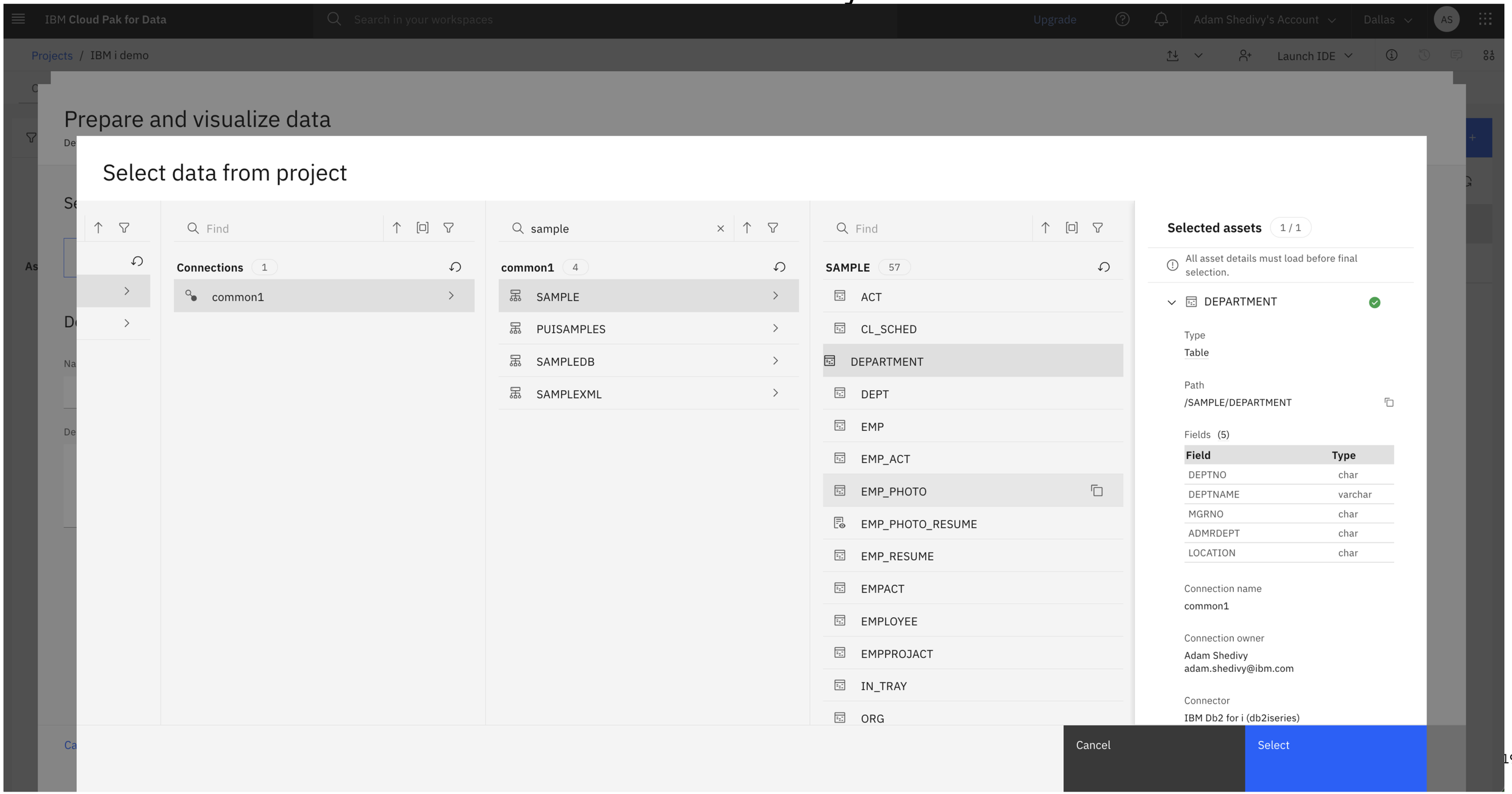
watsonx.ai: New IBM i asset



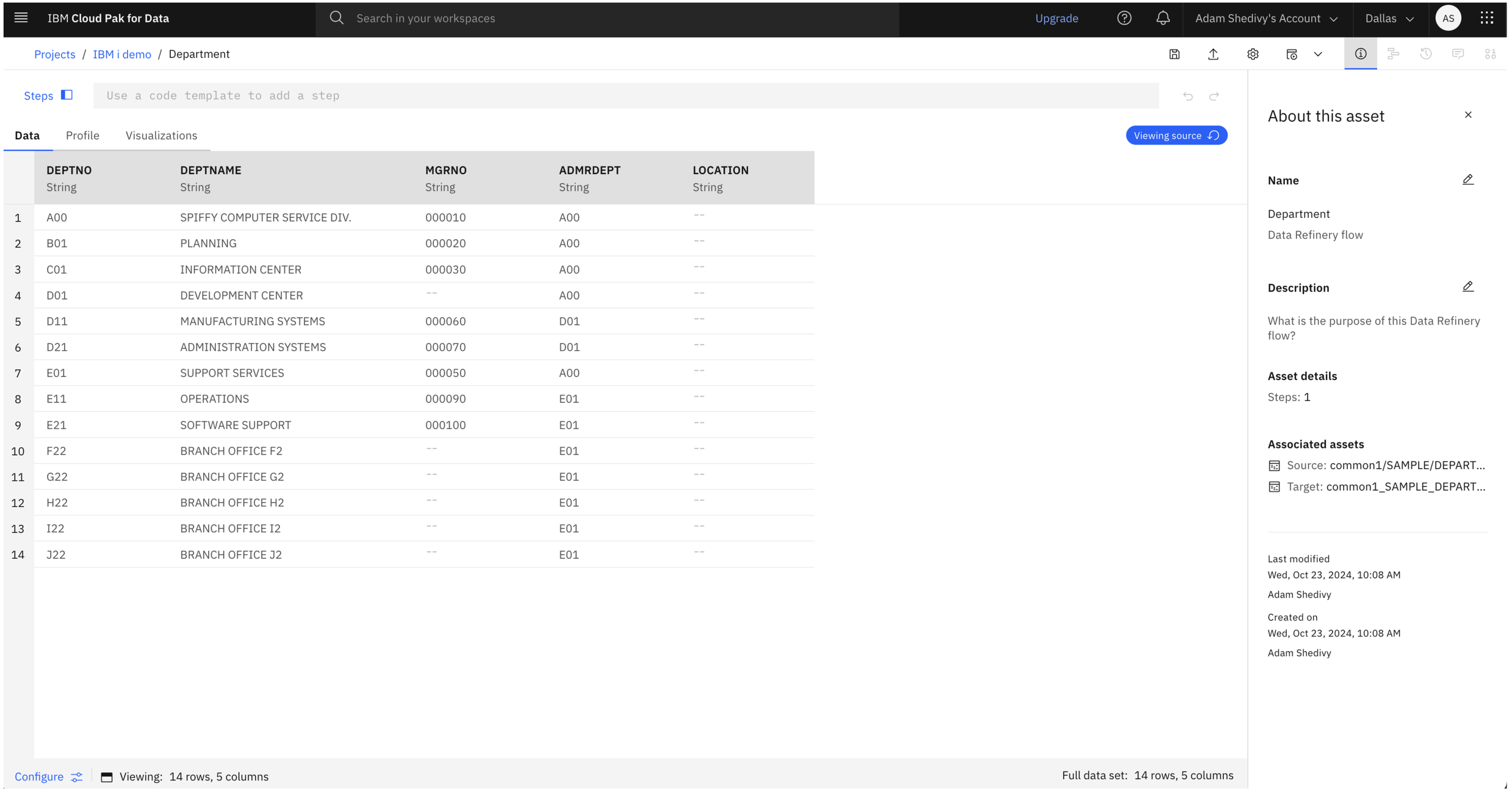
watsonx.ai: prepare and visualize data



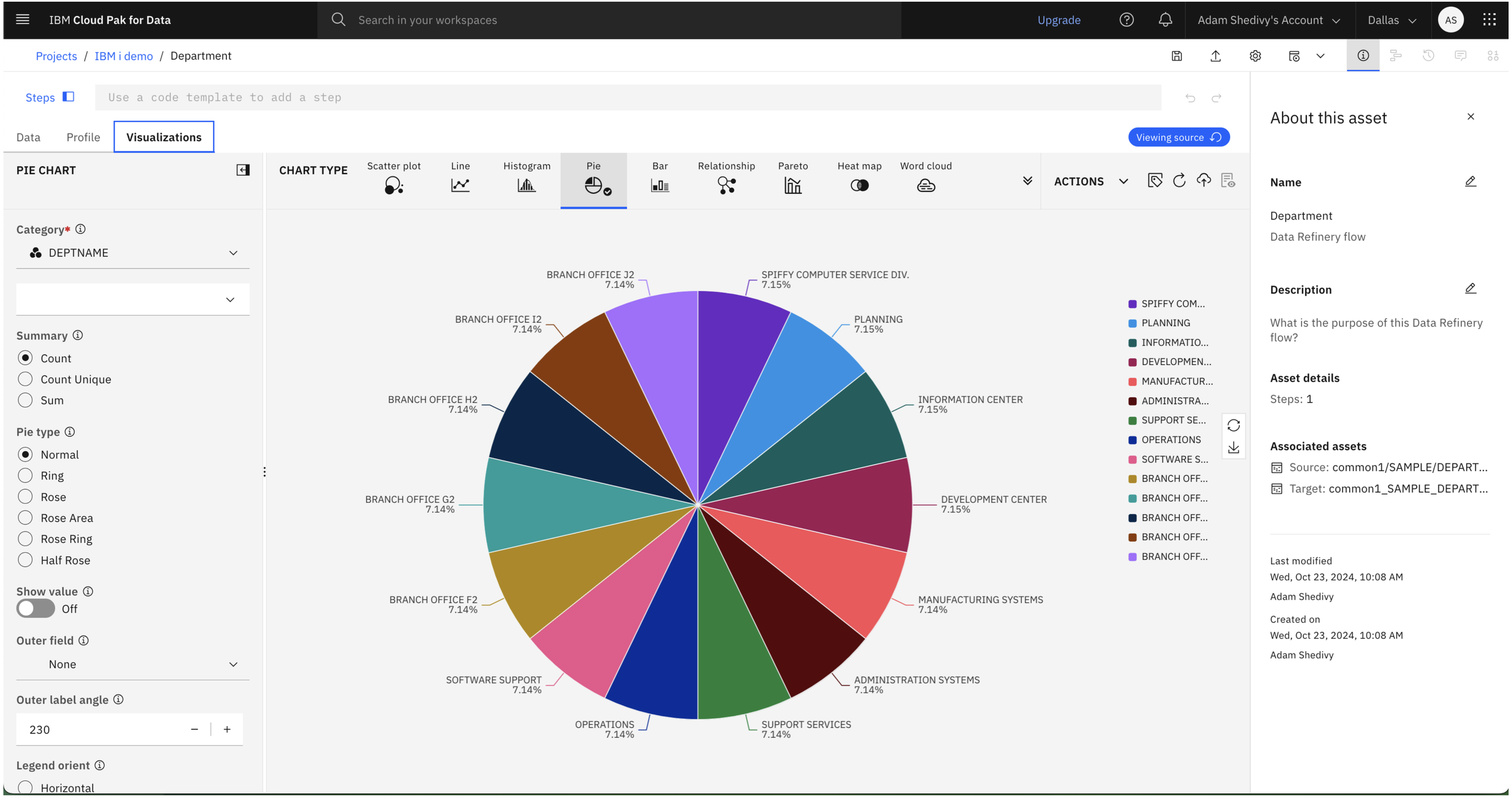
watsonx.ai: select data from IBM i system



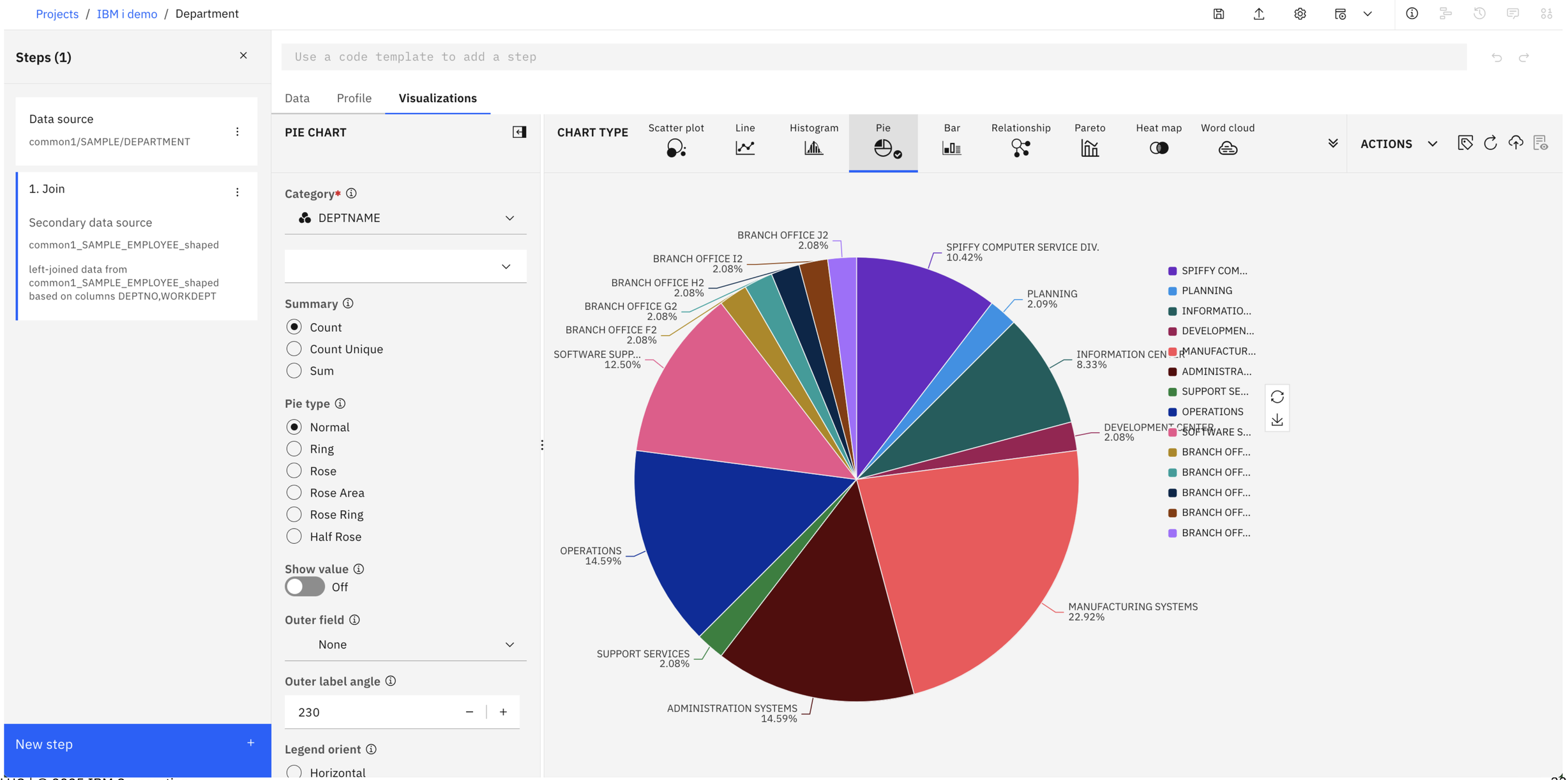
watsonx.ai: view data



watsonx.ai: visualize Db2 for i data



watsonx.ai: Add a “step” to combine data sources



watsonx.ai: work with data using Python notebooks

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Projects / IBM i demo / Employee-notebook

File Edit View Run Kernel Help | Not Trusted | Memory:222 / 8192 MB

Code | Python 3.11

[2]:

```
import os, types
import pandas as pd
from botocore.client import Config
import ibm_boto3

def __iter__(self): return 0

# @hidden_cell
# The following code accesses a file in your IBM Cloud Object Storage. It includes your credentials.
# You might want to remove those credentials before you share the notebook.

cos_client = ibm_boto3.client(service_name='s3',
    ibm_api_key_id='jc62ZQJ4mZbF3GV9tOir1h5dOZf8tOx7fcaxM1n7niWK',
    ibm_auth_endpoint="https://iam.cloud.ibm.com/identity/token",
    config=Config(signature_version='oauth'),
    endpoint_url='https://s3.direct.us-south.cloud-object-storage.appdomain.cloud')

bucket = 'ibmidemo-donotdelete-pr-wz07z0atiqlx1l'
object_key = 'data_asset/common1_SAMPLE_EMPLOYEE_shaped_8dook4569g813wullx96pe9hx'

body = cos_client.get_object(Bucket=bucket,Key=object_key)['Body']
# add missing __iter__ method, so pandas accepts body as file-like object
if not hasattr(body, "__iter__"): body.__iter__ = types.MethodType( __iter__, body )

df_1 = pd.read_csv(body)
df_1.head(5)
```

[2]:

	EMPNO	FIRSTNME	MIDINIT	LASTNAME	WORKDEPT	PHONENO	HIREDATE	JOB	EDLEVEL	SEX	BIRTHDATE	SALARY	BONUS	COMM
0	30	SALLY	A	KWAN	C01	4738	1975-04-05	MANAGER	20	F	1941-05-11	38250.0	800.0	3060.0
1	70	EVA	D	PULASKI	D21	7831	1980-09-30	MANAGER	16	F	1953-05-26	36170.0	700.0	2893.0
2	110	VINCENZO	G	LUCCHESSI	A00	3490	1958-05-16	SALESREP	19	M	1929-11-05	46500.0	900.0	3720.0
3	140	HEATHER	A	NICHOLLS	C01	1793	1976-12-15	ANALYST	18	F	1946-01-19	28420.0	600.0	2274.0
4	170	MASATOSHI	J	YOSHIMURA	D11	2890	1978-09-15	DESIGNER	16	M	1951-01-05	24680.0	500.0	1974.0

[ ]:

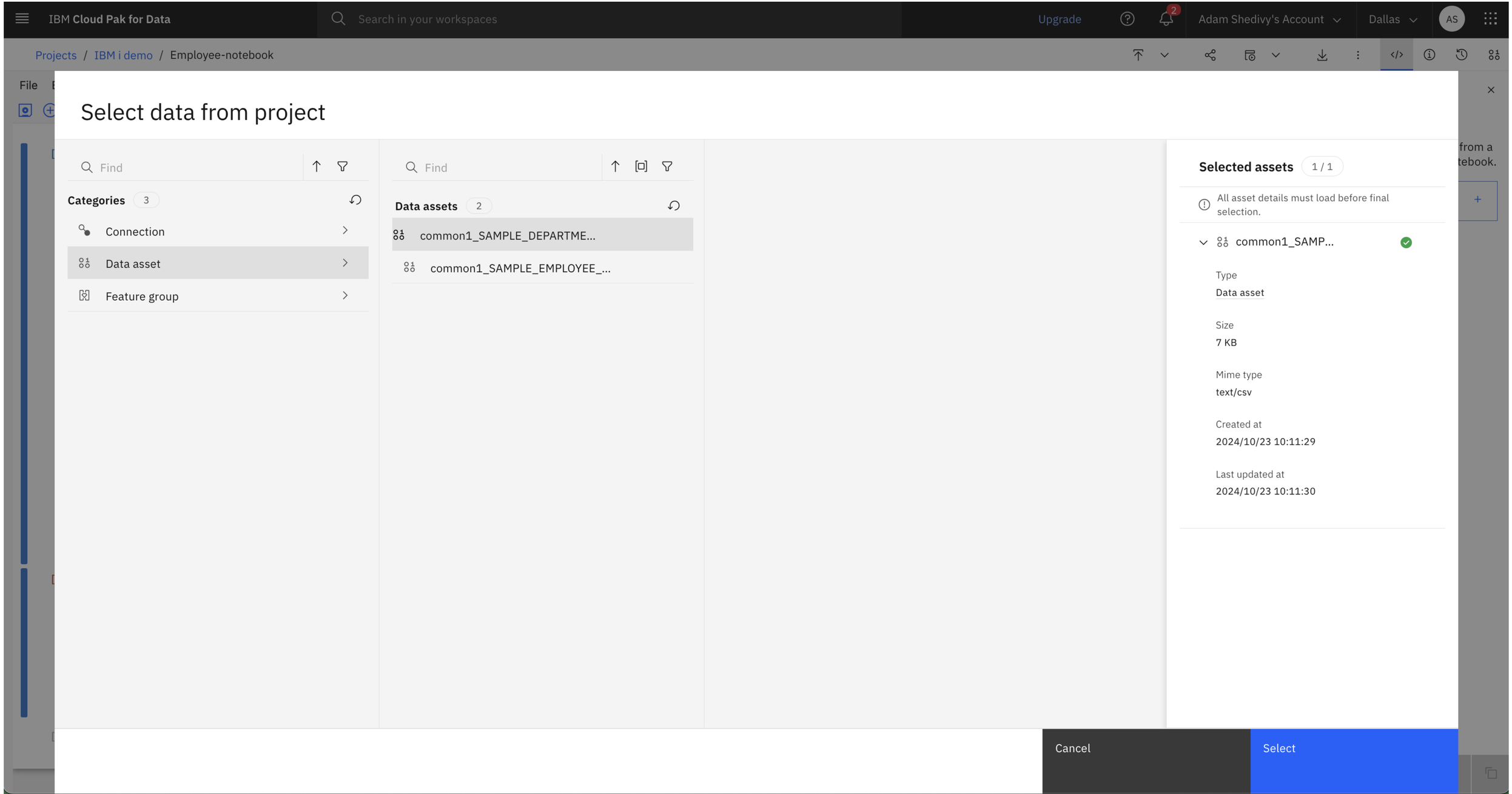
Read data

Generate a code snippet to load data from a data asset or connection into your notebook.

Select data from project +

Insert code to cell

watsonx.ai: add data to notebook



watsonx.ai: load data as Dataframe

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File Edit View Run Kernel Help | Not Trusted Memory:222 / 8192 MB | Code | Python 3.11

1	70	EVA	D	PULASKI	D21	7831	1980-09-30	MANAGER	16	F	1953-05-26	36170.0	700.0	2893.0
2	110	VINCENZO	G	LUCCHESSI	A00	3490	1958-05-16	SALESREP	19	M	1929-11-05	46500.0	900.0	3720.0
3	140	HEATHER	A	NICHOLLS	C01	1793	1976-12-15	ANALYST	18	F	1946-01-19	28420.0	600.0	2274.0
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[ ]:

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    ibm_auth_endpoint="https://iam.cloud.ibm.com/identity/token",
    config=Config(signature_version='oauth'),
    endpoint_url='https://s3.direct.us-south.cloud-object-storage.appdomain.cloud')

bucket = 'ibmidemo-donotdelete-pr-wz07z0atiqlx1l'
object_key = 'data_asset/common1_SAMPLE_DEPARTMENT_shaped_81y1lqq7m1ynlj3boc8zr6dlp'

body = cos_client.get_object(Bucket=bucket,Key=object_key)['Body']
# add missing __iter__ method, so pandas accepts body as file-like object
if not hasattr(body, "__iter__"): body.__iter__ = types.MethodType( __iter__, body )

df_2 = pd.read_csv(body)
df_2.head(10)
```

Read data

Generate a code snippet to load data from a data asset or connection into your notebook.

Selected data

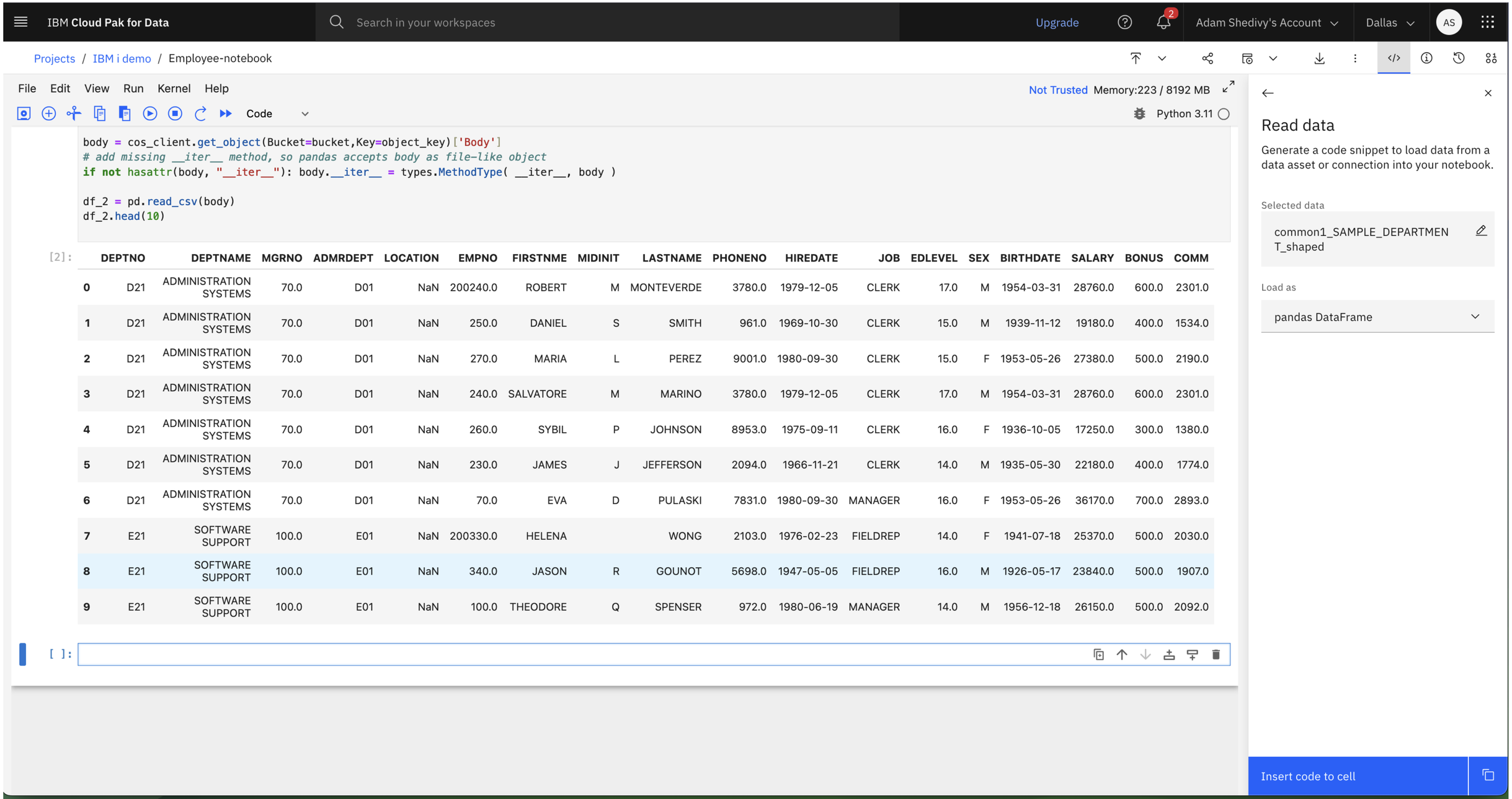
common1_SAMPLE_DEPARTMENT_shaped

Load as

pandas DataFrame

Insert code to cell

watsonx.ai: work with prepared data in notebook



	DEPTNO	DEPTNAME	MGRNO	ADMRDEPT	LOCATION	EMPNO	FIRSTNME	MIDINIT	LASTNAME	PHONENO	HIREDATE	JOB	EDLEVEL	SEX	BIRTHDATE	SALARY	BONUS	COMM
0	D21	ADMINISTRATION SYSTEMS	70.0	D01	NaN	200240.0	ROBERT	M	MONTEVERDE	3780.0	1979-12-05	CLERK	17.0	M	1954-03-31	28760.0	600.0	2301.0
1	D21	ADMINISTRATION SYSTEMS	70.0	D01	NaN	250.0	DANIEL	S	SMITH	961.0	1969-10-30	CLERK	15.0	M	1939-11-12	19180.0	400.0	1534.0
2	D21	ADMINISTRATION SYSTEMS	70.0	D01	NaN	270.0	MARIA	L	PEREZ	9001.0	1980-09-30	CLERK	15.0	F	1953-05-26	27380.0	500.0	2190.0
3	D21	ADMINISTRATION SYSTEMS	70.0	D01	NaN	240.0	SALVATORE	M	MARINO	3780.0	1979-12-05	CLERK	17.0	M	1954-03-31	28760.0	600.0	2301.0
4	D21	ADMINISTRATION SYSTEMS	70.0	D01	NaN	260.0	SYBIL	P	JOHNSON	8953.0	1975-09-11	CLERK	16.0	F	1936-10-05	17250.0	300.0	1380.0
5	D21	ADMINISTRATION SYSTEMS	70.0	D01	NaN	230.0	JAMES	J	JEFFERSON	2094.0	1966-11-21	CLERK	14.0	M	1935-05-30	22180.0	400.0	1774.0
6	D21	ADMINISTRATION SYSTEMS	70.0	D01	NaN	70.0	EVA	D	PULASKI	7831.0	1980-09-30	MANAGER	16.0	F	1953-05-26	36170.0	700.0	2893.0
7	E21	SOFTWARE SUPPORT	100.0	E01	NaN	200330.0	HELENA		WONG	2103.0	1976-02-23	FIELDREP	14.0	F	1941-07-18	25370.0	500.0	2030.0
8	E21	SOFTWARE SUPPORT	100.0	E01	NaN	340.0	JASON	R	GOUNOT	5698.0	1947-05-05	FIELDREP	16.0	M	1926-05-17	23840.0	500.0	1907.0
9	E21	SOFTWARE SUPPORT	100.0	E01	NaN	100.0	THEODORE	Q	SPENSER	972.0	1980-06-19	MANAGER	14.0	M	1956-12-18	26150.0	500.0	2092.0

The 4 layers of AI integration

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watsonx

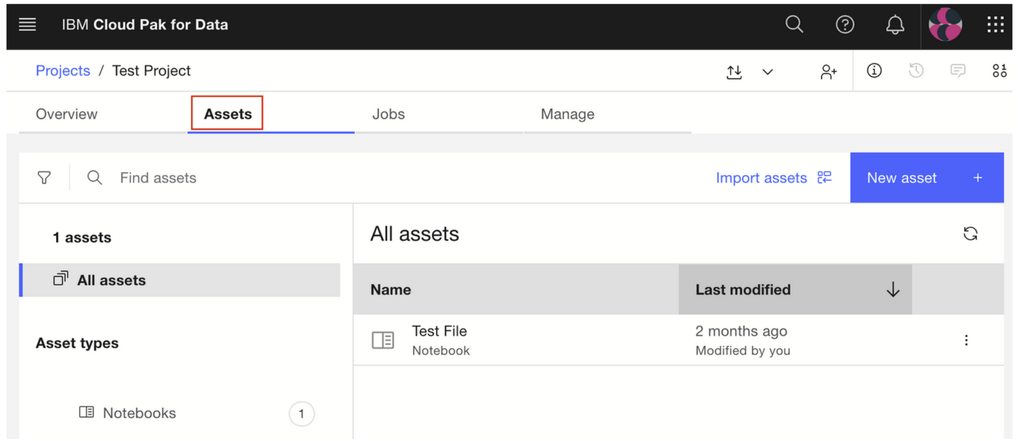
AI on IBM I guide - http://ibm.biz/ai-ibmi

A comprehensive guide to using AI with IBM i

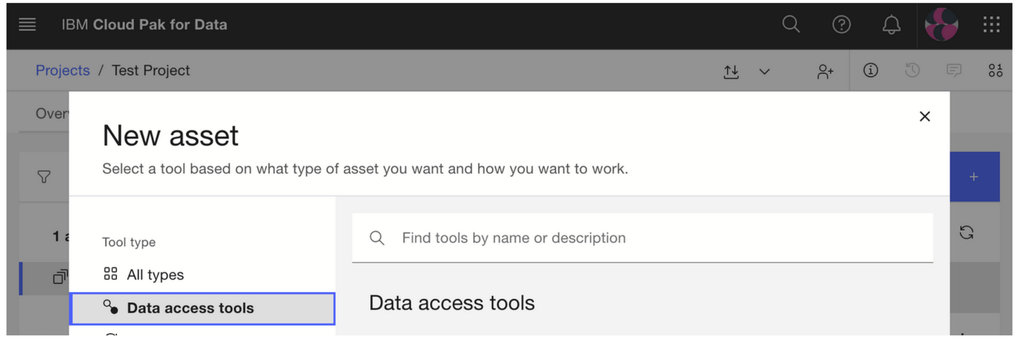
Search Ctrl K

Access Db2 from IBM Cloud Pak 4 Data

Go to the project page, and click the Assets tab



Click New asset > Data access tools > Connection



On this page