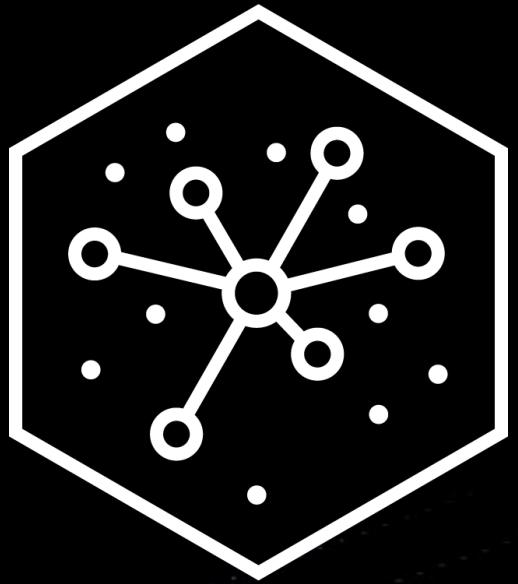
Hands-On AI, NLP, and Optimization Workshop

Starts at 9:00am EST

Hands-On AI, NLP, and Optimization Workshop



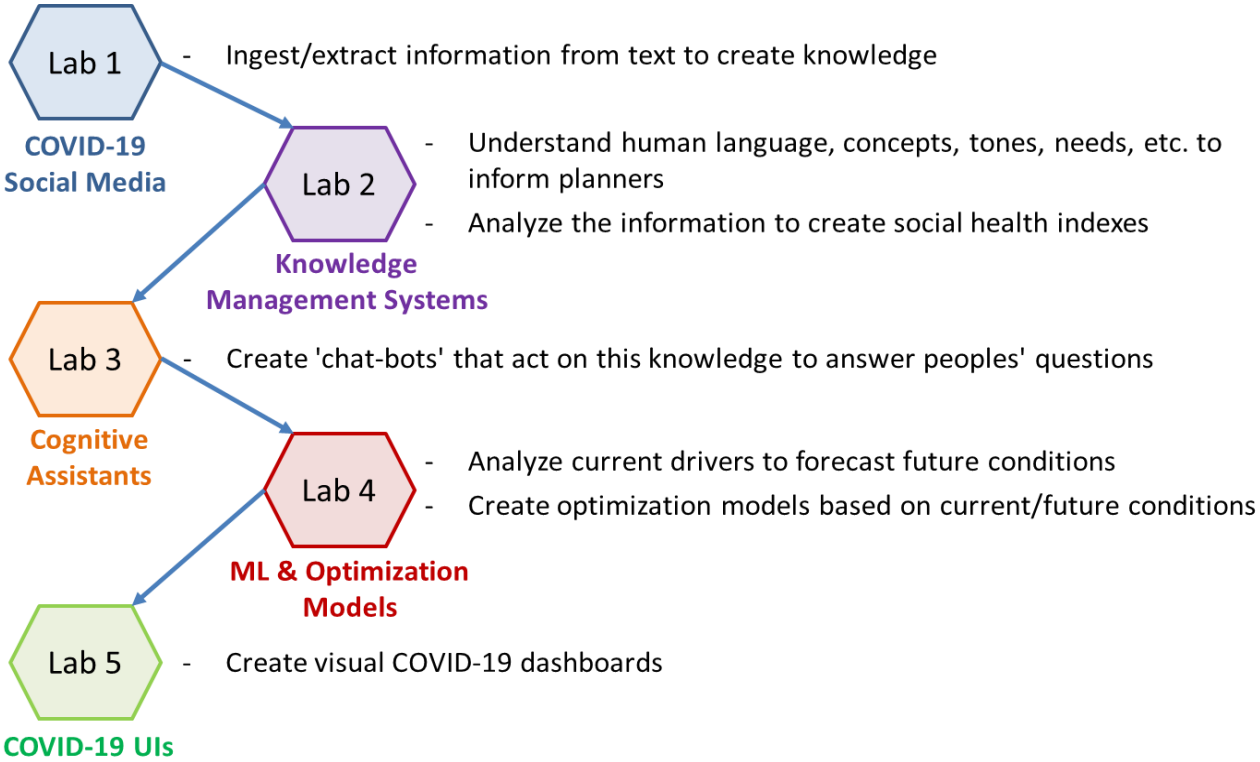
Starts at 9:00am EST

Agenda

Time	Description
09:00 AM – 10:00 AM	**Introduction to Cloud Pak for Data, Watson Services, and Watson Studio**
10:00 AM – 10:30 AM	**Lab-0: Set up Environment**
10:30 AM – 12:00 PM	**Lab-1: Develop socioeconomic annotators to extract domain information**
12:00 PM – 01:30 PM	**Lunch** **Lab-2: Use annotator to analyze documents to generate a COVID-19 vulnerability index, Smart Document Understanding, Relevancy Ranking**
01:30 PM – 02:30 PM	**Lab-3: Develop a COVID-19 Virtual Assistant**
02:30 PM – 03:30 PM	**Lab-4: Forecast COVID-19 Outbreaks, Optimal Assignment of Patients to Areas**
03:30 PM – 04:30 PM	**Lab 5: Develop COVID-19 Dashboard**
04:30 PM – 05:00 PM	**Wrap-up/Q&A**

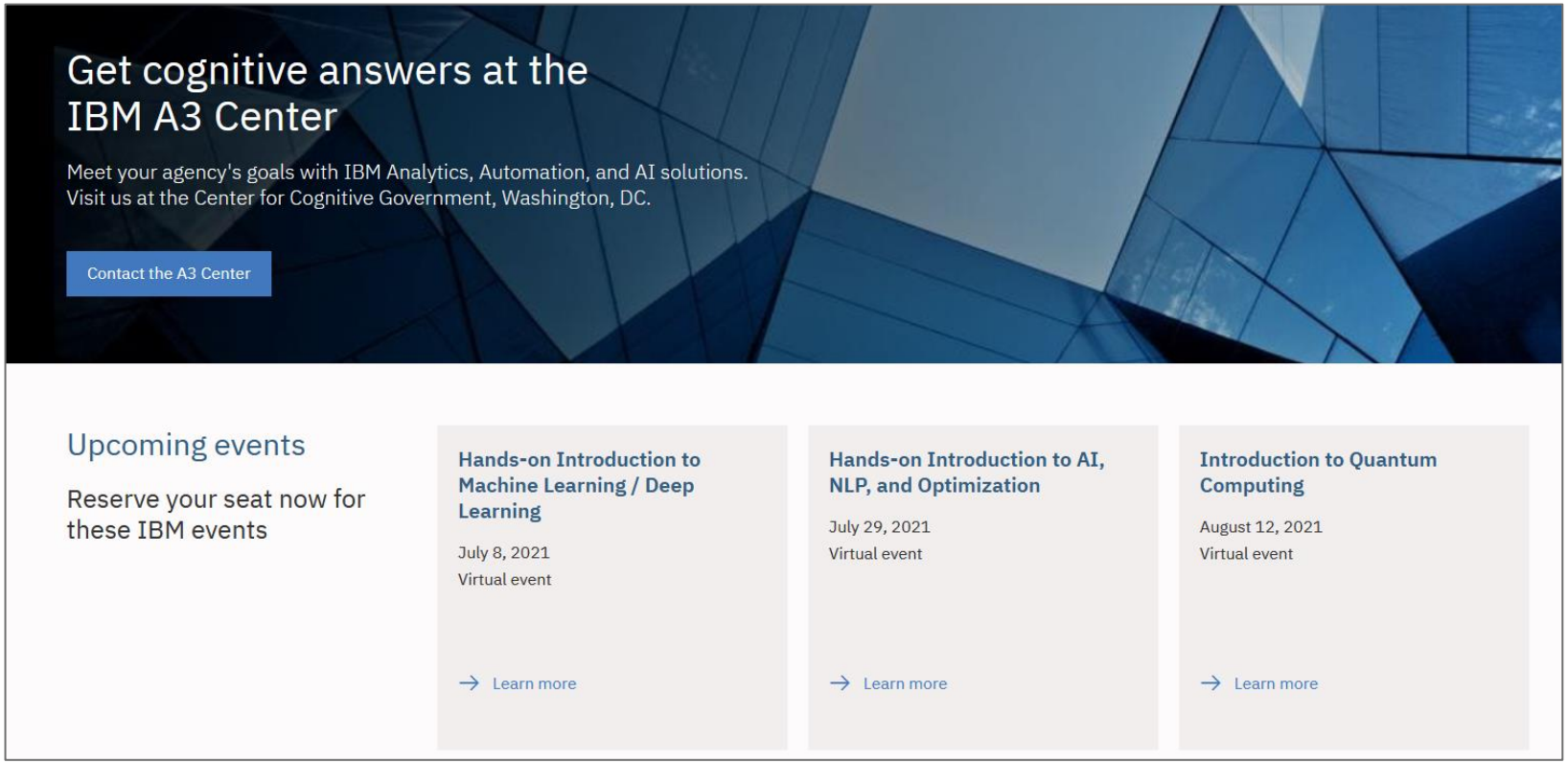
Workshop Goals

Apply Analytics and AI to COVID-19 use case

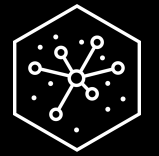


IBM A3 Center

Enabling clients to use technologies to develop art-of-the-possible solutions



IBM Federal and Public Sector Garage
Co-create and co-execute a minimally viable product



Get started co-creating with the IBM Garage

	Framing	Discovery	Solutioning	Scoping	MVP Build
Sessions	2 - 4 hours	2 hours - 2 days	2 hours - 2 days	2 - 4 hours	3 - 6 weeks
Client outcomes	• **Understand** the strategy • **Determine** business / technology initiative(s) to focus on • **Align** stakeholders on vision and desired outcome • **Confirm** executive sponsor, product owner, and governance model	• **Understand** target end users • **Understand** 'as-is' context of business and/or technology • **Guide** narrowing focus	• **Diverge** to explore potential solutions • **Converge** to select solution to invest in validating • **Identify** platform / initial technical components to be used • **Develop** roadmap	• **Define** hypothesis to be tested / proof-points to be proven • **Define** scope of MVP • **Identify** resources needed to build MVP	• **Build** MVP that leverages IBM hybrid cloud technologies • **Define** a secure minimum viable architecture that mitigates risk • **Set up** cloud platform and automation • **Build** skills and evolve culture through pairing • **Create** an implementation roadmap for a hybrid, multi-cloud platform and DevOps adoption that leverages IBM hybrid cloud
Approach	• Business landscape • Initiative exploration • Vision definition • Opportunity canvas	• Process mining • End-user research • Technical discovery • Data assessment • Modernization assessment	• Visioning • Generating big ideas • 'Just enough' architecture • Rapid prototyping • Identify accelerators • Platform initiation	• Hypotheses definition • MVP definition • Data required • End user validation needed	**WORKLOAD** **PLATFORM**

Presentation Outline

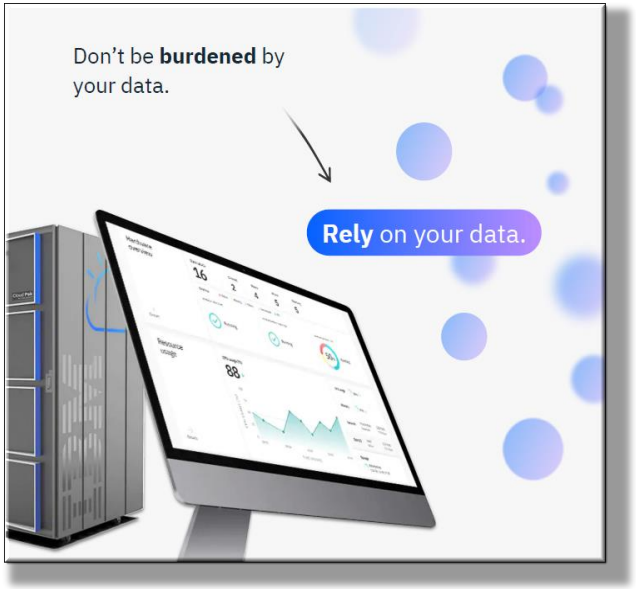
- **IBM Cloud Pak for Data Overview**
- **Watson Services Overview**
- **Watson Studio Overview**
- **Labs**

IBM Cloud Pak for Data

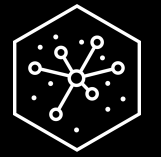
IBM Cloud Pak for Data is a single unified, integrated platform which helps to simplify the collection, organization and analysis of data.

With it, enterprises can turn data into insights through an integrated cloud-native architecture.

IBM Cloud Pak for Data is extensible and easily customized to unique client data and AI landscapes through an integrated catalog of IBM, open source, and third-party microservices.



Considerations for Cloud Pak for Data

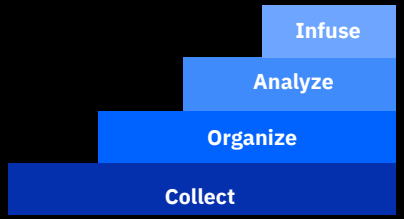


- Integrated Multi-modal platform
  - Use tool of choice and collaborate via project entities
  - Code/Click Options
  - All Analytics – Dashboard, Predictive, Prescriptive
  - All Data
  - Seamless user experience
- Hybrid Cloud
  - Cloud native architecture
  - Cloud agnostic – any vendor cloud or data center
  - Scalable data and analytic services
  - Flexibility to move data science to the data.
- Operationalize Machine Learning
  - Ease and flexibility of deployment at enterprise scale
  - Advanced model management capabilities.
  - Monitoring model performance
- Governance
  - Omnipresent, yet invisible – infused throughout
  - Data automatically integrated with governance capability for auto-discovery, catalog, and search subject to policies and rules
- Automate, Automate, Automate

IBM Cloud Pak for Data

Unified, modular, deployable anywhere

The AI Ladder



App Developers and SREs| Business Partners | Data Engineers | Data Stewards | Data Scientists | Business Users

Integrated User Experience

Extensible: APIs, partner ecosystem, and solutions

Collect

- Provision SQL and NoSQL databases
- Create Connections
- Data virtualization
- ...

Organize

- Data quality and classification
- Policies and rules
- Data cataloging
- Self-service discovery & search
- Data transformation
- ...

Analyze and Infuse

- Business reporting
- Data science and visualization
- AI lifecycle automation
- AI Apps
- Industry accelerators
- ...

Core Services

- User access management
- Security contexts and RBAC
- Volume management
- Monitoring and metering
- Service provisioning
- Operators
- Diagnostics
- Backup and migrate

Red Hat OpenShift

IBM Cloud | Amazon Web Services | Microsoft Azure | Google Cloud | Hyperconverged system

Cloud Pak for Data Deployment Options

- Cloud Pak for Data as a Service
  - Managed offering provided on the IBM Cloud
  - Used for today's labs
- Cloud Pak for Data
  - Available anywhere Red Hat OpenShift is supported
  - Public Clouds – IBM, Amazon Web Service, Microsoft Azure, Google Cloud
  - On-premise
- Cloud Pak for Data System
  - Pre-configured hardware
  - Same capabilities as Cloud Pak for Data
  - On-premise

IBM Cloud Satellite

Build Faster. Securely. Anywhere

Consume IBM Cloud services anywhere.

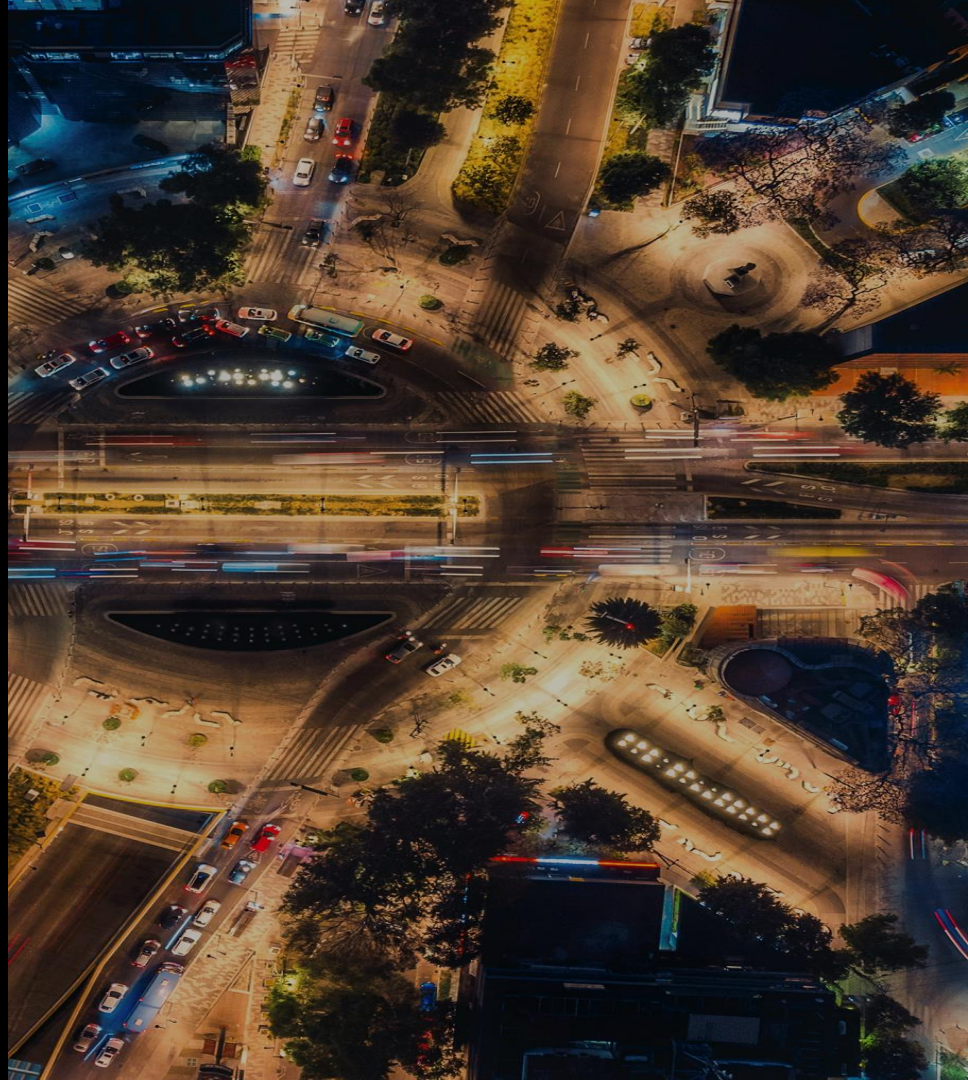
- On prem, at the edge or on other public clouds

Flexible Infrastructure options:

- Meet you where you are with existing infrastructure, integrated appliances or your public cloud accounts

Industry Optimized including FS Cloud :

- Controls strong enough for banks and regulated industries coming 2H2021



Presentation Outline

- **IBM Cloud Pak for Data Overview**
- **Watson Services Overview**
- **Watson Studio Overview**
- **Labs**

Watson NLP Services


Watson Assistant


Watson Discovery


Knowledge Studio


Natural Language Understanding


Tone Analyzer

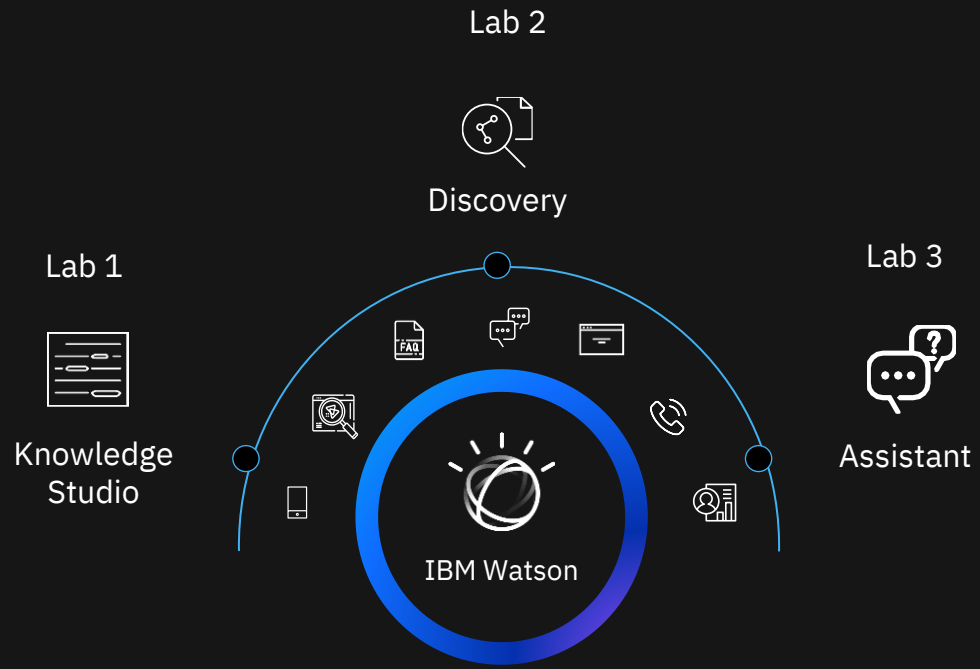

Speech-to-Text


Text-to-Speech


Language Translator


Natural Language Classifier

IBM Watson NLP



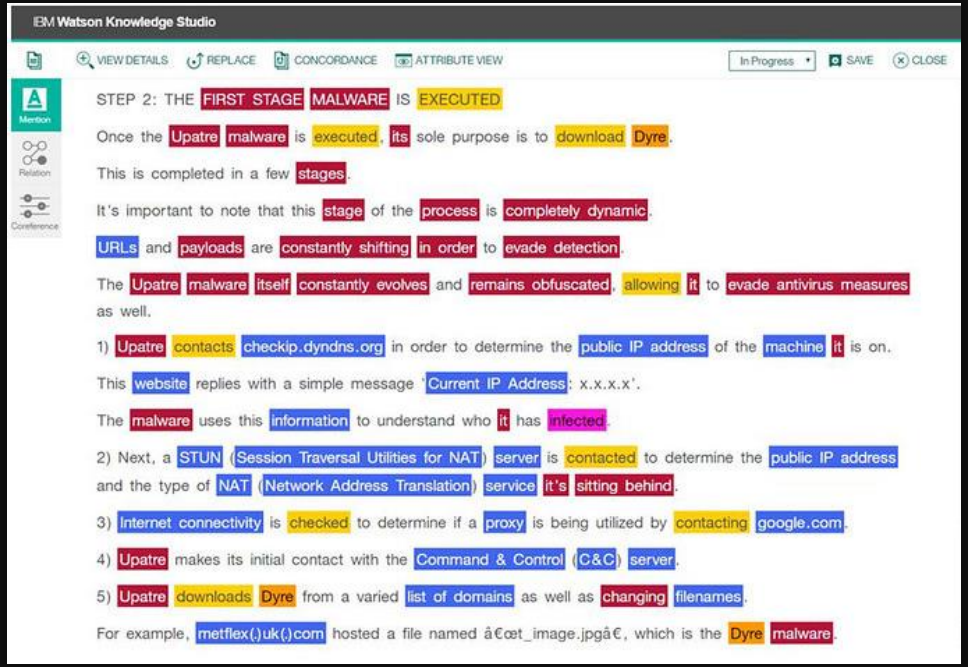
Knowledge Studio

Knowledge Studio

Domain-specific insight

Visually build domain-specific NLP models

- Bring experts together in a collaborative environment to teach Watson to understand the linguistic nuances of your domain.
- Build models without requiring deep technical skills or coding
- Apply curated model to multiple applications including Discovery and Assistant



How Knowledge Studio makes sense of natural language

Unstructured Data

"This on-site investigation focused on the performance of the **Certified Advanced 208-Compliant air bag system** in a **2005** **Ford Escape XLT 4x4** sport utility vehicle. This **two-vehicle crash** occurred in **July 2014** at **1539** hours in the state of Colorado."

Annotator

Structured Data

Part of car	**Certified Advanced 208-Compliant air bag system**
Model year	**2005**
Manufacturer	**Ford**
Model	**Escape XLT 4x4**
Incident	**Two-vehicle crash**
Date of incident	**July 2014**
Time of incident	**1539**

Watson Discovery

Watson Discovery

Deep Text Analysis and Document Conversion

Diverse data ingestion

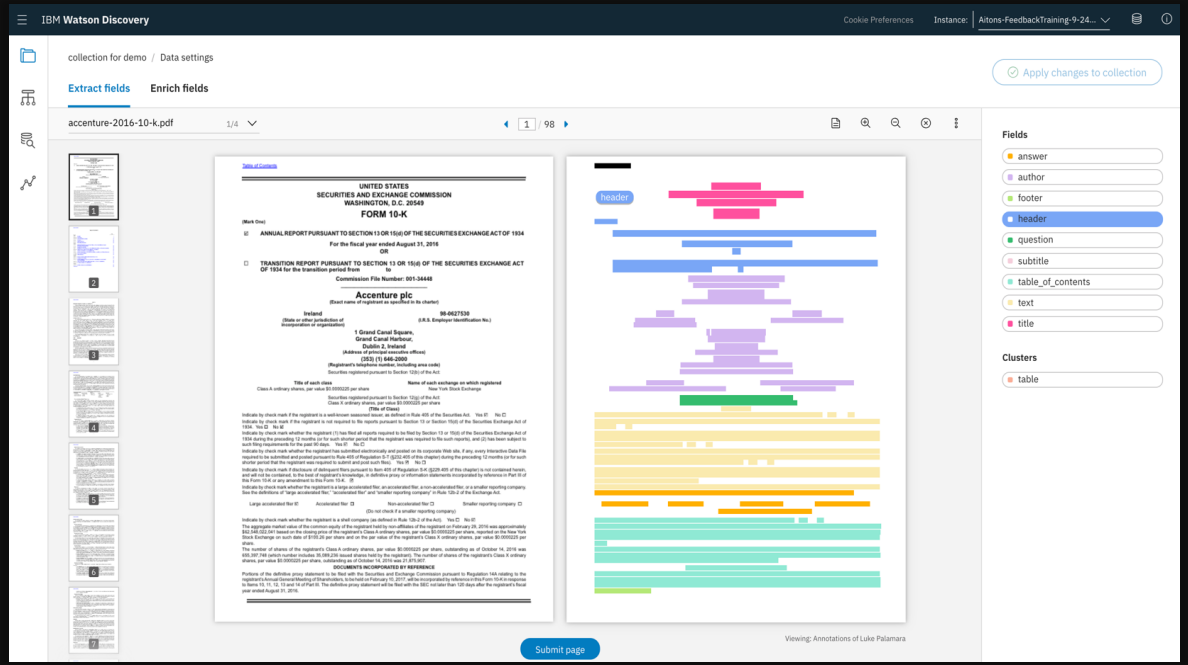
Using APIs, web uploads, or data crawler and feed-through Document conversion to deal with multiple, varied file types.

Apply enrichments

Uses custom models to extract, entities, relationships, keywords, sentiment, etc.

Extract insights

Use simple but powerful queries that support multiple query types including Boolean, filter, and aggregation queries to discover patterns, trends, and answers.



Watson Discovery
Comparison versus Traditional Search

Discovery search

How to properly install child restraints

147 answers found in **7** documents

Service Manual for 2008 Pontiac G8.pdf — confidence **59%**

Lower Anchors and Tethers for Children (LATCH)

"... int, following the instructions that came with that restraint, and also the instructions in this manual. When installing a child restraint with a top tether, you must also use either the lower anchors or the safety belts to properly secure the child restraint. A child restraint must never be installed using only the top tether and anchor. In order to use the LATCH system in your vehicle, you need a child restraint that has LATCH attachments. The child restraint manufacturer will provide you with instructions on how to use the child restraint an ..."

child restraint | LATCH system uses anchors | LATCH system | installation of a child restraint | ...

Service Manual for 2008 Pontiac G8.pdf — confidence **45%**

Securing Child Restraints (Rear Seat)

"... dy the instructions that came with your child restraint to make sure it is compatible with this vehicle. If your child restraint has the LATCH system, see Lower Anchors and Tethers for Children (LATCH) on page 1-40 for how to install your child restraint using LATCH. If you secure a child restraint using a safety belt and it uses a top tether, see Lower Anchors and Tethers for Children (LATCH) on page 1-40 for top tether anchor locations. Do not secure a child restraint in a position without a top tether anchor if a national or local law req ..."

child restraint | top tether | safety belt | use of the top tether | ...

Service Manual for 2008 Pontiac G8.pdf — confidence **43%**

Traditional search

install child restraint

6 documents found

Service Manual for 2008 Pontiac G8.pdf

2008 Pontiac G8 Owner Manual GENERAL MOTORS, GM, the GM Emblem, PONTIAC, the PONTIAC Emblem, are registered trademarks of General Motors Corporation, and the name G8 is a trademark of ...

Chevrolet Express 2006 Equipment Adaptive.pdf

14V706000 CHEVROLET EXPRESS 2006 EQUIPMENT ADAPTIVE Record: Cummings Mobility Conversion & Supply (Cummings) is recalling certain model year 2006-2014 Ford E-150, E-250, E-350, Chevrolet Express, 2006 ...

Ford Focus 2001 Electric Component.pdf

02V288000 FORD FOCUS 2001 ELECTRICAL SYSTEM: BATTERY: CABLES Record: Certain passenger vehicles equipped with zetec engines, loose or broken attachments and misrouted battery cables could lead to cabl ...

Honda CR-V 2002 Seats.pdf

02V251000 HONDA CR-V 2002 SEATS AMERICAN HONDA MOTOR CO. Record: On certain sport utility vehicles, the front seat anchorage nut strength is insufficient because the nuts were installed improperly. If ...

Pontiac Sunfire 1996 Steering Rack.pdf

02V286000 PONTIAC SUNFIRE 1996 STEERING: RACK AND PINION Record: Certain passenger vehicles and mini vans have lower pinion bearings in the power rack and pinion assembly in which the retainer tabs we ...

Discovery + Knowledge Studio

Social Media Analysis

Discover trends, patterns, and sentiment with aggregate analysis of news and social media sources. Surface anomalies, key events, and relationships.

Watson Discovery News

Continuously updated collection of 13 million+ articles from international news sources and social media sites.

Contract Analysis

Ability to extracts data and elements from contracts and other governing or regulatory documents to streamline business processes.

Content Intelligence

Automatically understand and extract the structure and content of contracts, invoices, and purchase orders - without prior training.

IP Analysis

Ability to understand highly-technical legal and product document to assist patent officers in assessing novelty.

IBM IP Advisor

Assists IBM IP professionals in analyzing patent applications against large corpus of prior art, legal documentation, current news sources, etc.

Project Debater

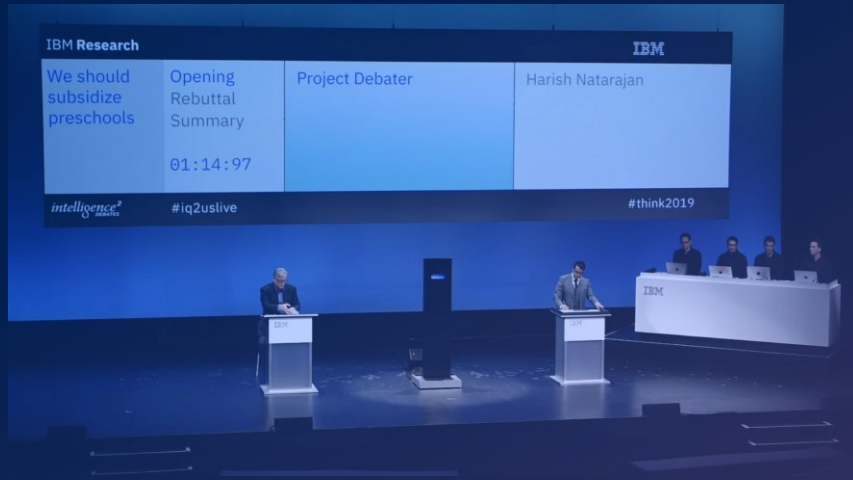
IBM has commercialized IBM Research and Project Debater technologies to help identify, understand and analyze the most challenging aspects of human language and deliver deeper business insights including:

The three upcoming updates include:

1.Summarization: Pulls textual data from a variety of sources to provide users with a summary of what is being said and written about a particular topic.

2.Advanced Topic Clustering: Enables users to "cluster" incoming data to create meaningful "topics" of related information automatically, which can then be analyzed.

3.Customizable Classification of Elements in Business Documents: Enables clients to create AI models to more easily classify clauses that occur in such business documents as contracts, invoices, and procurement contracts.



Watson Assistant

Watson Assistant

Build, train, and deploy conversational interaction on any device, application, or channel – on any cloud.

Low-code platform

Intuitive building interface that helps you– from coders to the C-suite – to successfully build and deploy an assistant quickly.

Seamlessly hands off to agents

Connect existing service to desk for transfer to human agents.

Powered by best in class NLU

Best in class AI powers the underlying intent-based language models.

Flexible Dialogue

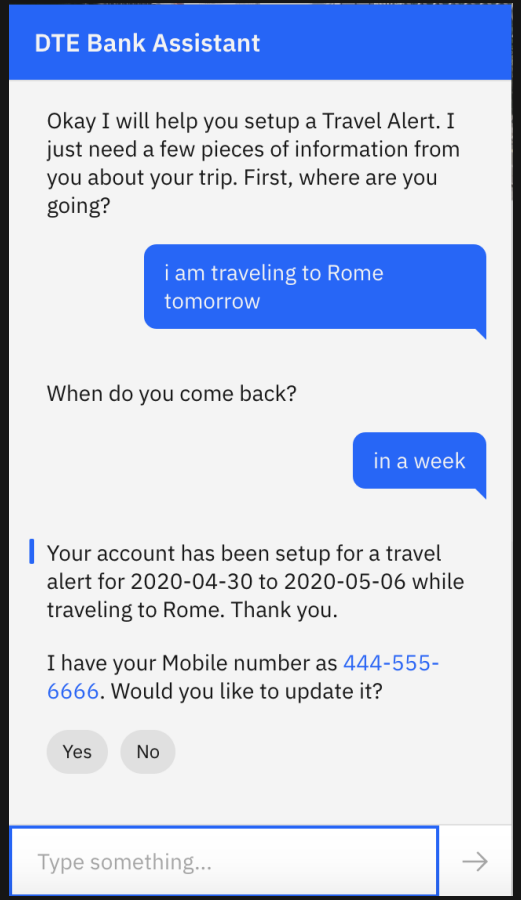
Nuanced dialogue options allowing for flexible conversation structure including disambiguation and contextual understanding.

Connects to any channel

You have channels, applications, and content in place, allowing the Assistant to connect to external web services and software.

Analytics

Visualize trends in message data, allowing action to be taken and improvements to be made where required.



Intents

Intent Password Reset

“ I forgot my password… ”

“ How do I get a new password? ”

“ Can’t login into your site… ”

“ My login isn’t working, please help… ”

“ Can you reset my password? ”

Assistant Language Model

“I’m frustrated, I haven’t been able to login into your online billing system”

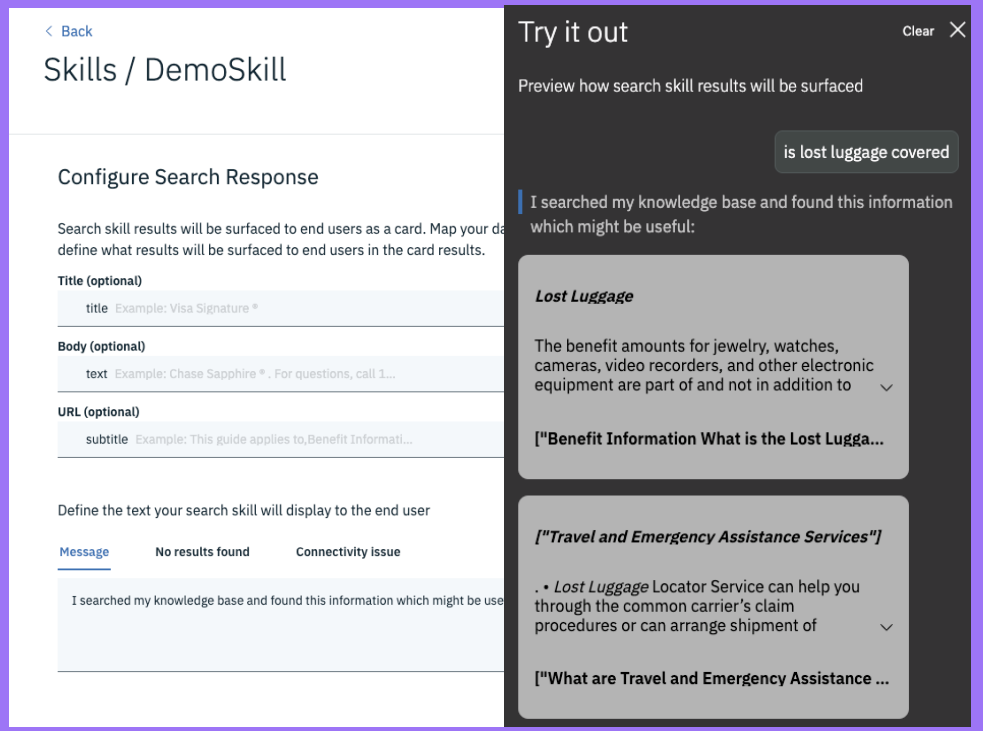
Extract other key information from a question

Intent	Password Reset
Entities	Online Billing System
Emotional Tone	Anger
Context	Bill Smith, 47 / Gold Member
Context	Mobile

Watson Assistant Search Skill

Simple integration between Watson Assistant and Watson Discovery to provide answers to all of your customers' and employees' questions

- Improve the coverage of your assistant by calling out to a "search skill" from any dialog node
- Search results are formatted automatically by search skill
- Ingestion and Sync to common knowledge base and CMS products, like Salesforce Knowledge, Box, Sharepoint, and others…



Watson Assistant Voice Interaction

- Watson answers the most common queries using Watson Assistant with natural sounding neural speech synthesis.
- Fast-track your customers to the answers they need.
- Watson can send and receive SMS & MMS messages during an ongoing voice call
- Allows Watson to send and receive information which is not suitable as a spoken response - e.g. web links, images of damage to property, email addresses, 2 factor authentication texts
- At any point during a call Watson can initiate a call transfer to an agent

Watson Assistant

Retain Industry/Organization Knowledge

Make deep institutional knowledge available to everyone in the organization by creating chatbots and knowledge management systems that can share expertise.

– Reduce workload on experts

– Retain learnings from SMEs as they change roles or departments.

Improve Customer Experience

Watson answers the most common queries using a Watson powered virtual agent with natural sounding neural speech synthesis

– Reduce calls going to human agents

– Resolve queries more quickly

Assist Agents

Watson listens in to ongoing call between caller and agent, producing live transcript and sends the live transcript to Watson Discovery to find relevant information.

– Faster call resolution

Presentation Outline

- **IBM Cloud Pak for Data Overview**
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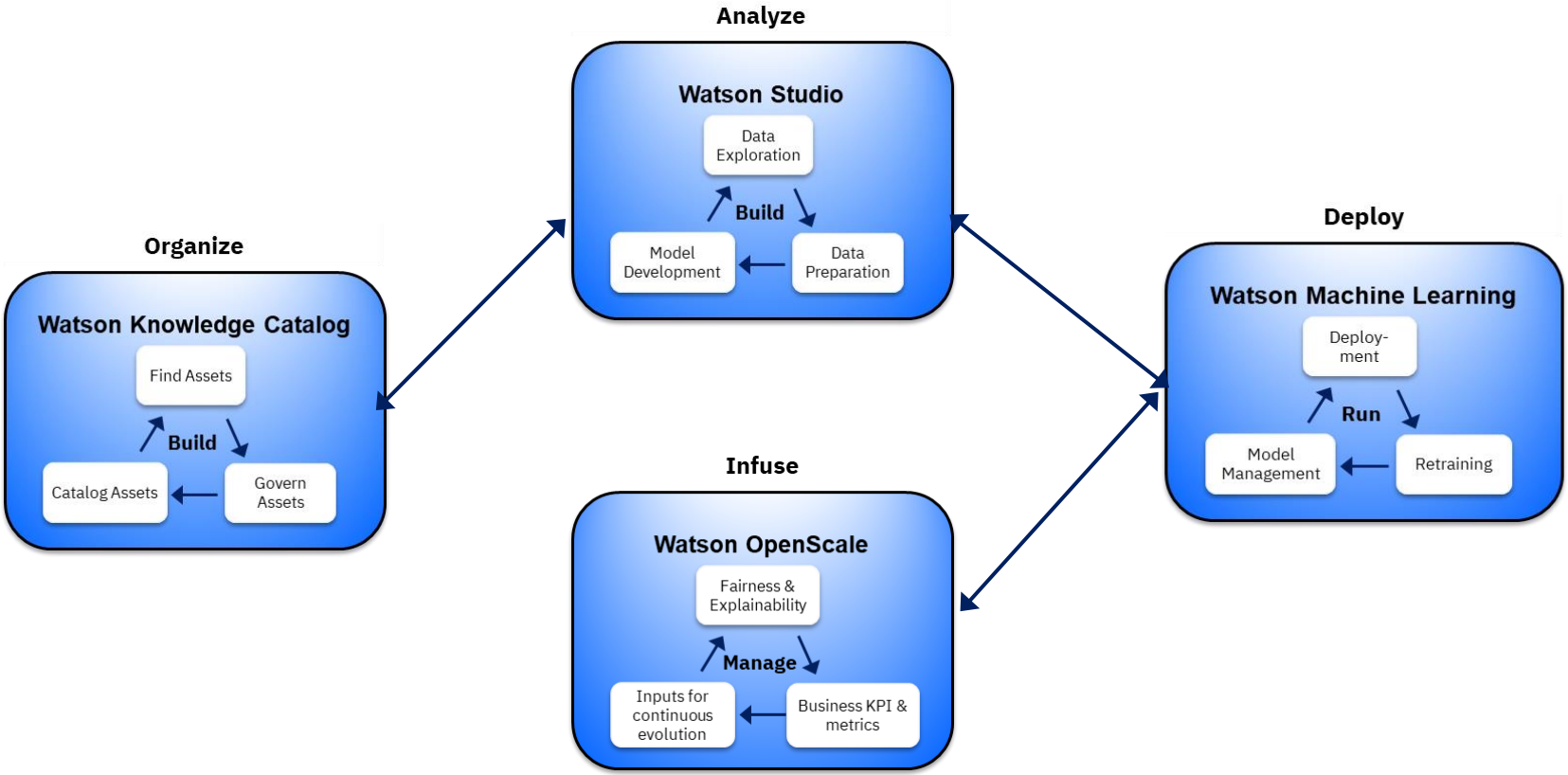
Watson Studio Platform



Organize
Watson Knowledge Catalog (WKC)

Enterprise Data Governance

- Data governance—know your data
- To set up the foundation of a DataOps program, organizations need to comply with regulatory requirements, communicate and enforce policies and standards, and manage metadata.

CDO, Data Stewards

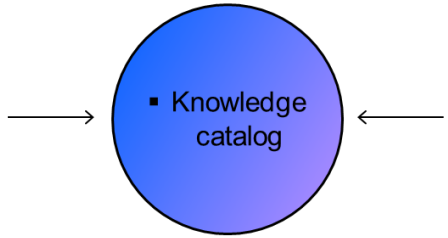
- Build/Import Business Glossary
- Manage Reference Data
- Manage Data Classes
- Auto-Discover metadata assets
- Classify data assets
- Define policies/rules
- Data governance workflow
- Data Lineage

Enterprise Data Quality

- Data quality—trust your data
- Data is useful only if its quality, content, and structure is well understood. Delivering reliable, quality, timely data for business consumption is a continuous process.

Data stewards and data quality analysts

- Profile data
- Understand, monitor and remediate data quality
- Apply validation rules



Enterprise Data Consumption

- Data consumption—use your data
- Enterprises need to surface business-ready data to consumers allowing them to deliver timely value to the business and make better decisions.

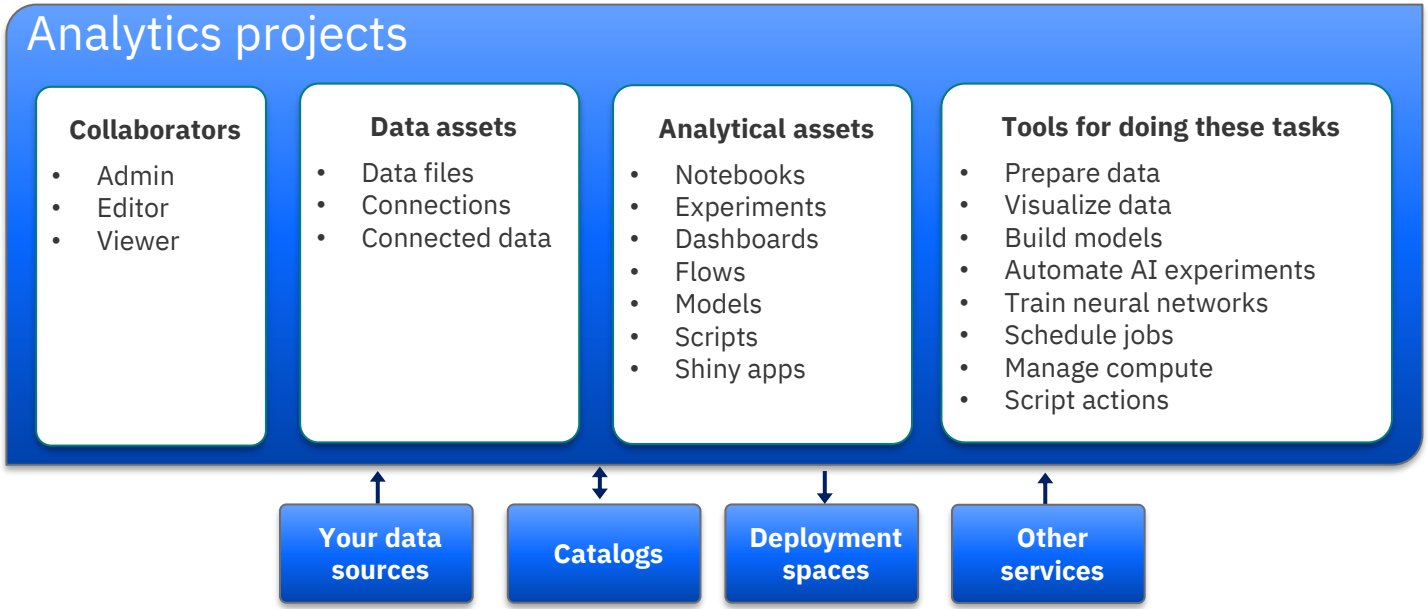
Data analysts, data scientists, business analysts

- Search and find relevant data
- Prepare data for consumption and analysis
- Policy Enforcement
- Tag, rate, comment on and share the data
- Data Lineage

Analyze
Watson Studio: Collaborating with Analytics Projects

Watson Studio provides the environment and tools to collaborate on business problems.

Watson Studio is centered around the *Analytics Project.* Data scientists and business analysts use analytics projects to organize resources and analyze data with various tools.

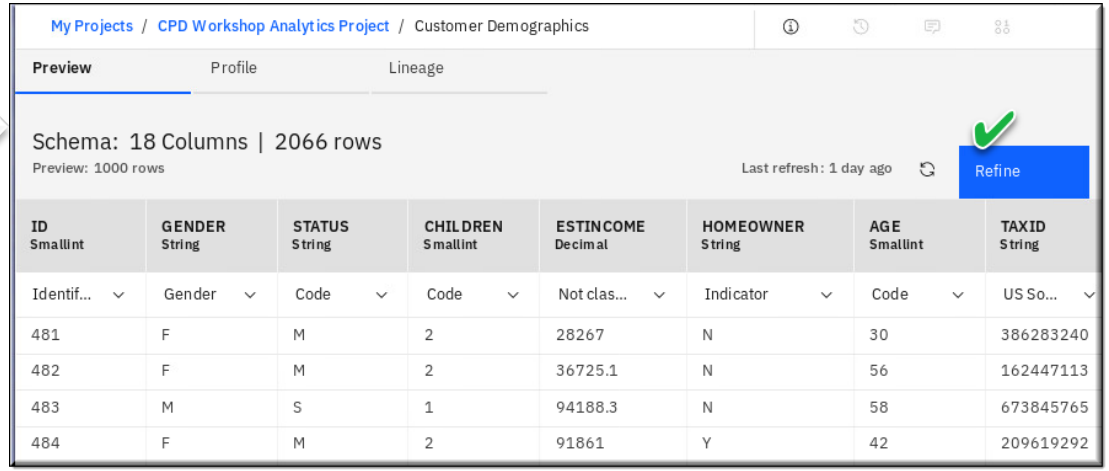


Analyze
Refine data with visualizations

Refine can cleanse and shape tabular data with a graphical flow editor using functions and logical operators.

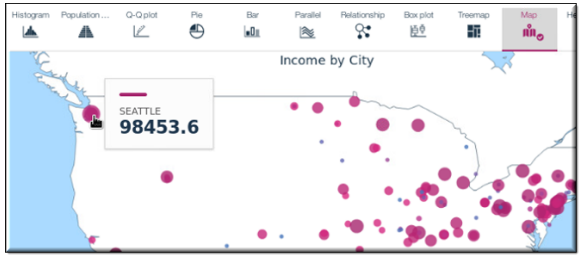
Use it to remove data that is incorrect, incomplete, improperly formatted, etc.

Shape the data by filtering, sorting, combining or removing columns. You can create a Data Refinery flow as a set of ordered operations on the data to run repeatedly any time.



ID Smallint	GENDER String	STATUS String	CHILDREN Smallint	ESTINCOME Decimal	HOMEOWNER String	AGE Smallint	TAXID String
Identif...	Gender	Code	Code	Not clas...	Indicator	Code	US So...
481	F	M	2	28267	N	30	386283240
482	F	M	2	36725.1	N	56	162447113
483	M	S	1	94188.3	N	58	673845765
484	F	M	2	91861	Y	42	209619292

Data Refinery also includes a graphical interface to profile data to validate it with 20+ customizable charts that give perspective and insights into the data.



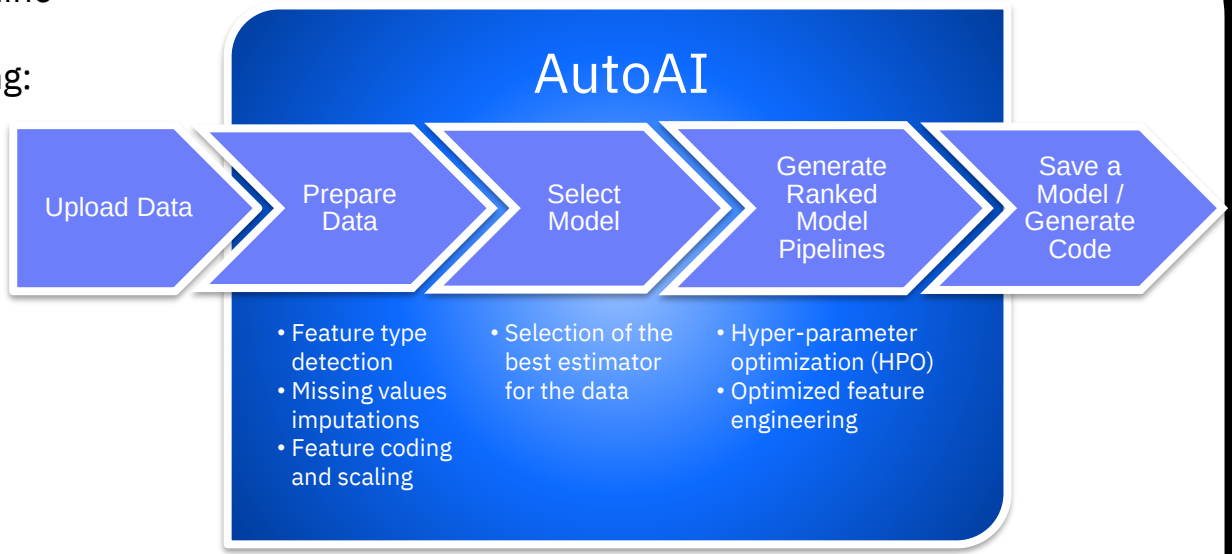
Analyze
AutoAI * – Overview

AutoAI is an award-winning technology that simplifies the Machine Learning model creation and AI lifecycle by automating the following:

- **Data preparation**
- **Model development**
- **Feature engineering**
- **Hyper-parameter optimization**

AutoAI delivers training feedback visualizations for real-time model performance results with:

- **Binary, Multiclass, and Regression support**
- **One-click model deployment**



* AutoAI is enabled with the Watson Machine Learning service install, but it is driven through a Watson Studio Analytics Project

Analyze
AutoAI – Pipelines

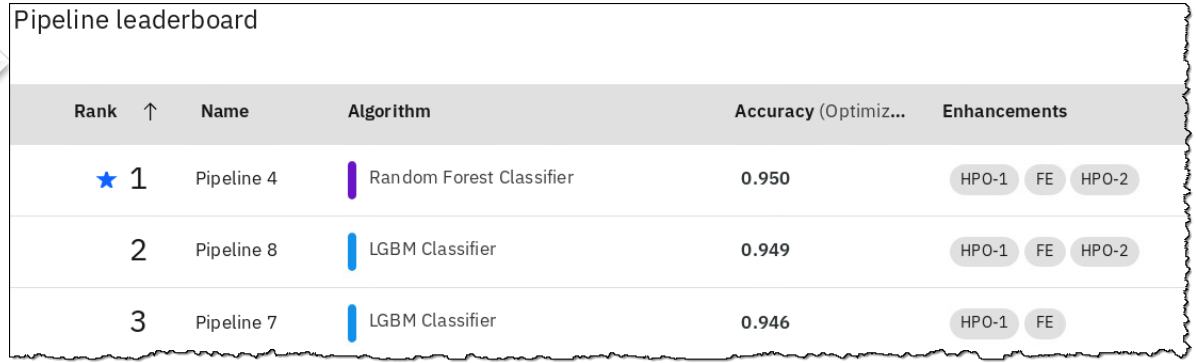
AutoAI pipeline leaderboard

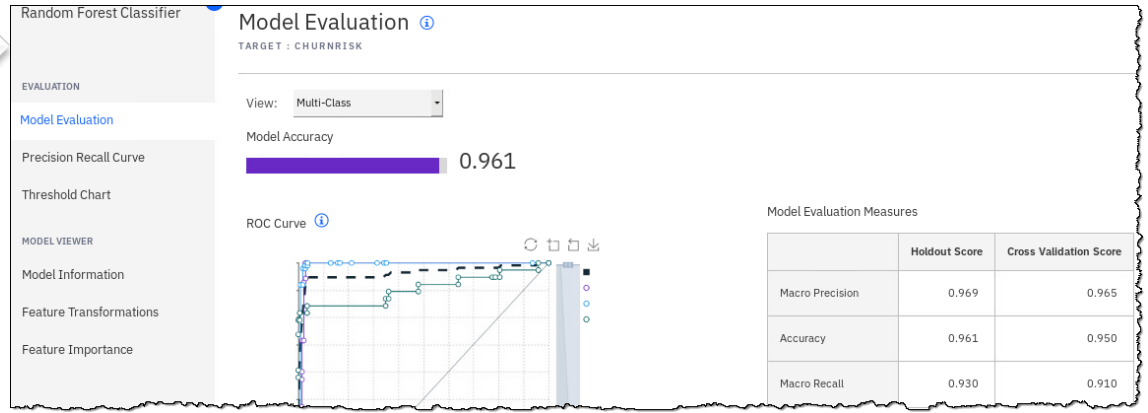
Shows the ranking of the pipelines for each potential model, the higher the better.

After AutoAI completes its model creation steps, you can drill into the pipeline(s) to understand how it came to its conclusion.

Save the pipeline in your project as a:

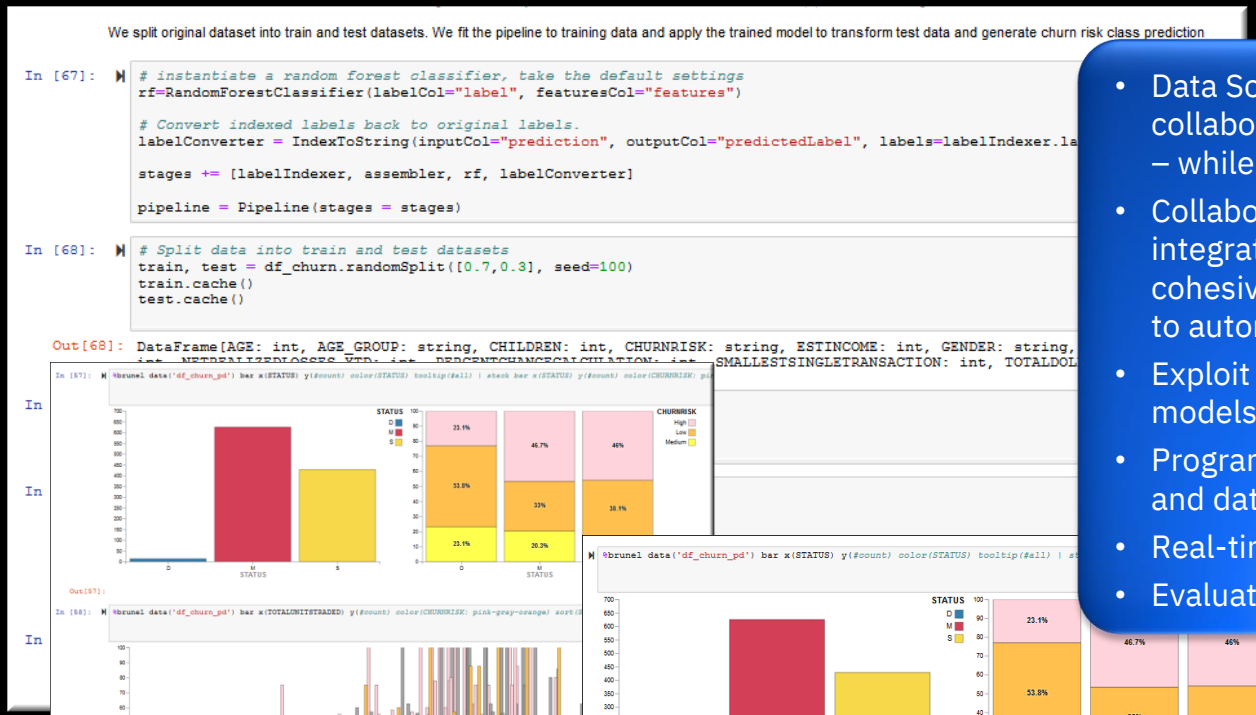
- **model**
- **notebook**





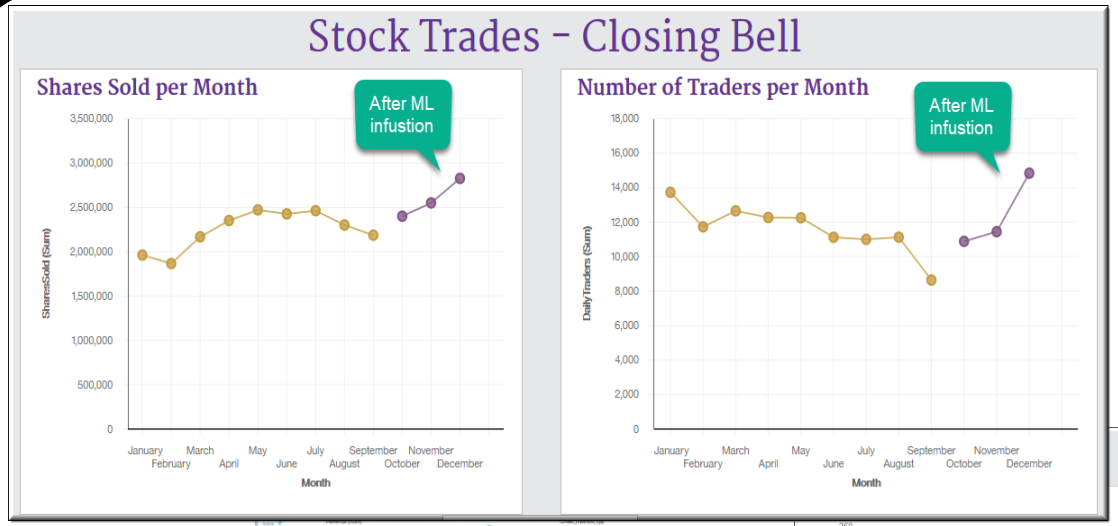
Analyze

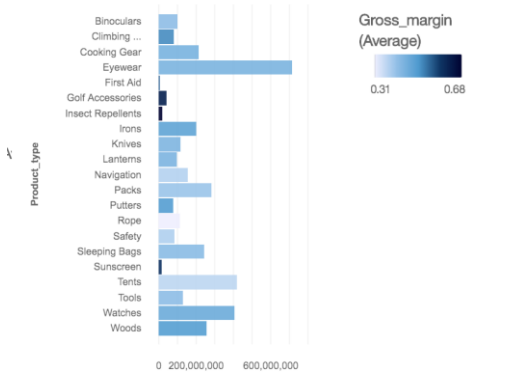
Notebooks, RStudio: Build Data Science & Machine Learning models

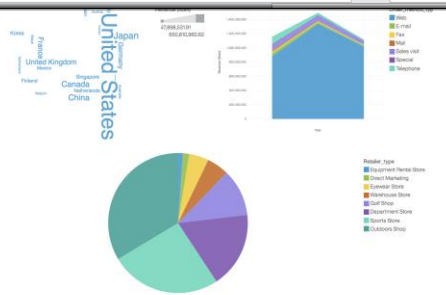


- Data Scientists and Data Engineers collaborate with each other in CPD platform – while still maintaining data governance
- Collaboration using GitHub or BitBucket is integrated into the platform, which brings a cohesiveness to the work culture and helps to automate CI/CD pipe line
- Exploit GPUs for deep learning predictive ML models
- Programmatically build data visualizations and data wrangling
- Real-time or batch model scoring
- Evaluate model accuracy

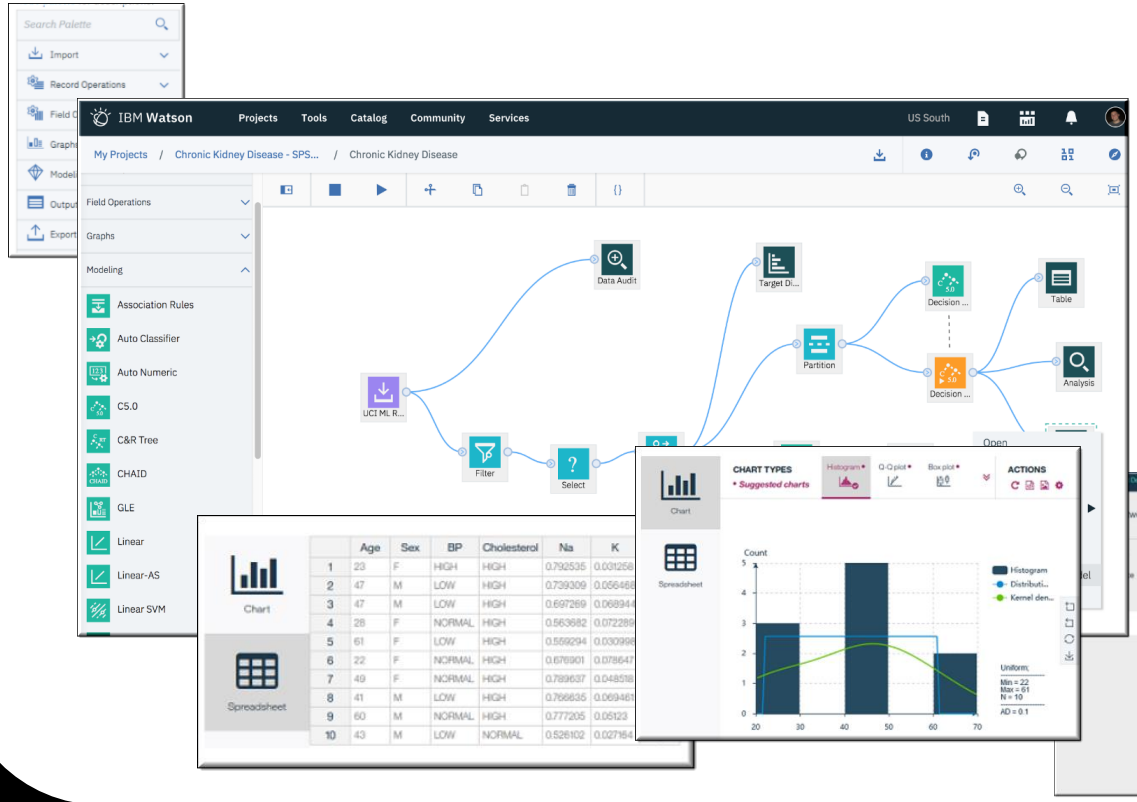
Analyze
Cognos Dashboards Embedded







Analyze
SPSS Modeler



SPSS Modeler

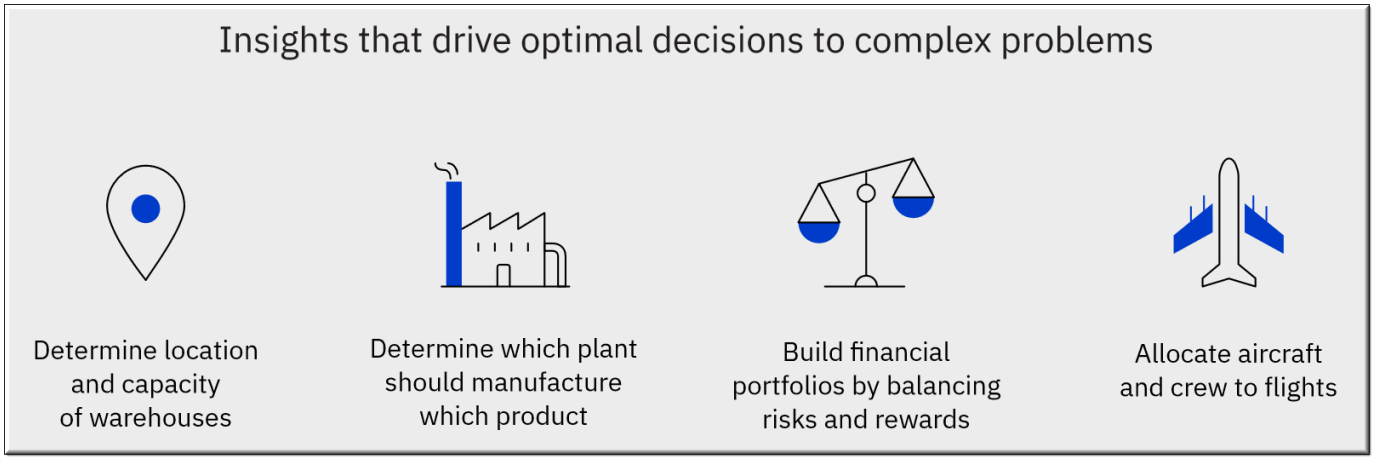
- A leading visual data science and machine-learning and predictive analytics solution
- Helps enterprises accelerate time to value and achieve desired outcomes by speeding up operational tasks for data scientists and business analysts
- Tap into data assets and modern applications, with complete algorithms and models that are ready for immediate use

Analyze
Decision Optimization

Decision Optimization (DO) enables data science teams to capitalize on the power of *prescriptive analytics* and build solutions using a combination of techniques like optimization and machine learning.

Integrated with Watson Studio, Decision Optimization can combine optimization techniques with coding and non-coding tools, model management and deployment – as well as other data science capabilities.

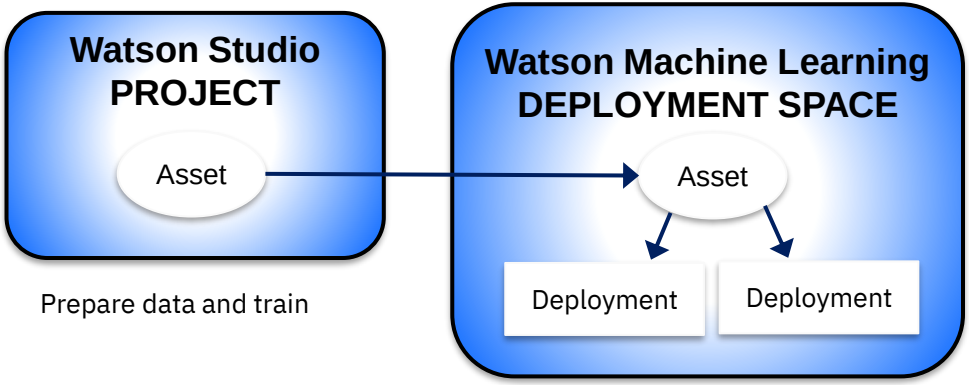
Decision Optimization evaluates millions of possibilities – balancing trade-offs and business constraints to find the best possible solution.



Deploy
Watson Machine Learning: Deployment Spaces

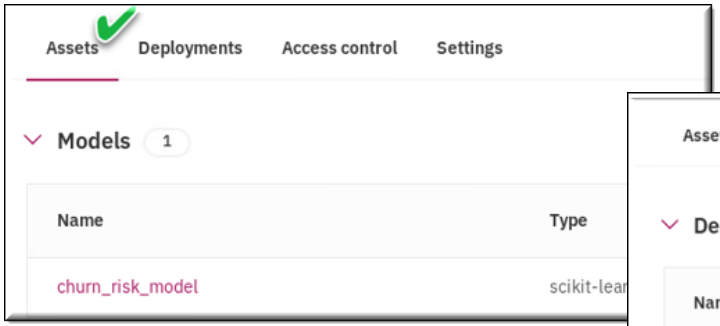
A **Deployment Space** is where you can:

- **Promote and save models**
- **Create the deployments from the models**
- **Find the information you need to score the model and get a prediction back**
- **Embed the deployment in an app so you can interact with it programmatically**



Prepare data and train

Configure, test, deploy and monitor



Deploy
Watson Machine Learning: Deployments

A **Deployment** is the last stage of the model development work. It means you put the model into production so that you can pass data to the model and return a score (or prediction).

After deploying a model, you can access the model *endpoint*, which you will need to make the model available for wider use in applications.

There are three type of WML deployments:

- **Online –** Provides an API endpoint needed to access the deployment programmatically to use in an application. Code snippets are provided in a variety of programming languages that illustrate how to access the deployment.
- **Batch –** Processes input data from a file and writes the output to a file.

Infuse
Watson OpenScale: Overview

Watson OpenScale:

- Automates and operates AI at scale across its entire lifecycle
- Delivers transparent, explainable outcomes freed from bias and drift
- Provides confidence in AI outcomes and spans the gap between the teams that operate AI and the business units that use these applications
- Monitors models developed in a 3rd party IDE, open source framework and hosted in a 3rd party or private model serve engine

Monitor AI at Scale

Watson OpenScale

- Operations Dashboard
- Fairness & Bias Mitigation
- Drift Detection
- Explainability
- Business KPIs
- Payload Logging
- Data Mart

Model build / train frameworks

TensorFlow

scikit learn

Keras

PYTORCH

Caffe2

Spark MLlib

Model serving environments

kubernetes

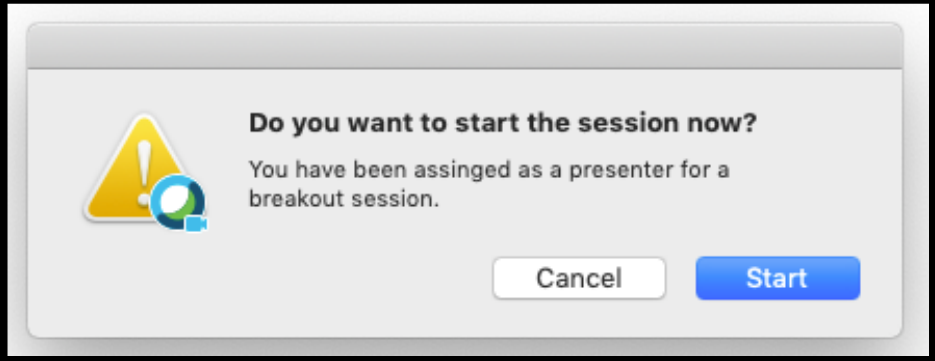
Azure ML

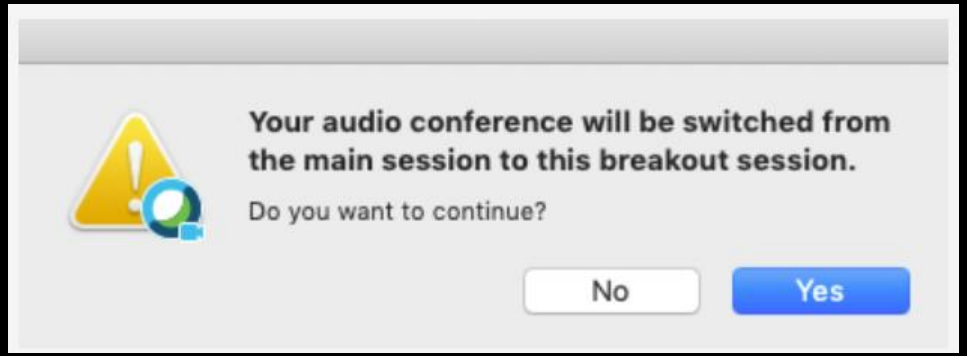
aws

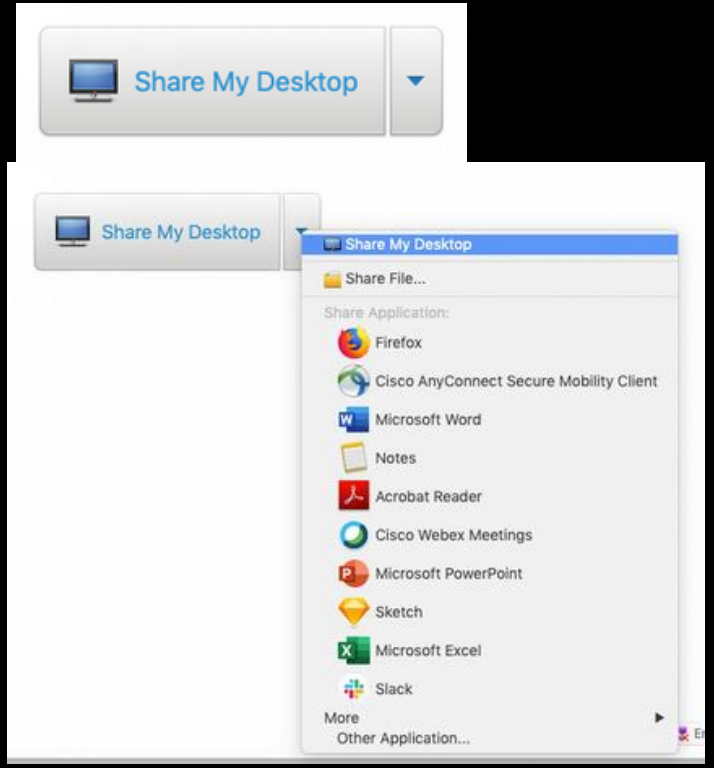
Presentation Outline

- **IBM Cloud Pak for Data Overview**
- **Watson Services Overview**
- **Watson Studio Overview**
- **Labs**

Breakout Rooms







Note: you will need to un-mute when you join the breakout room

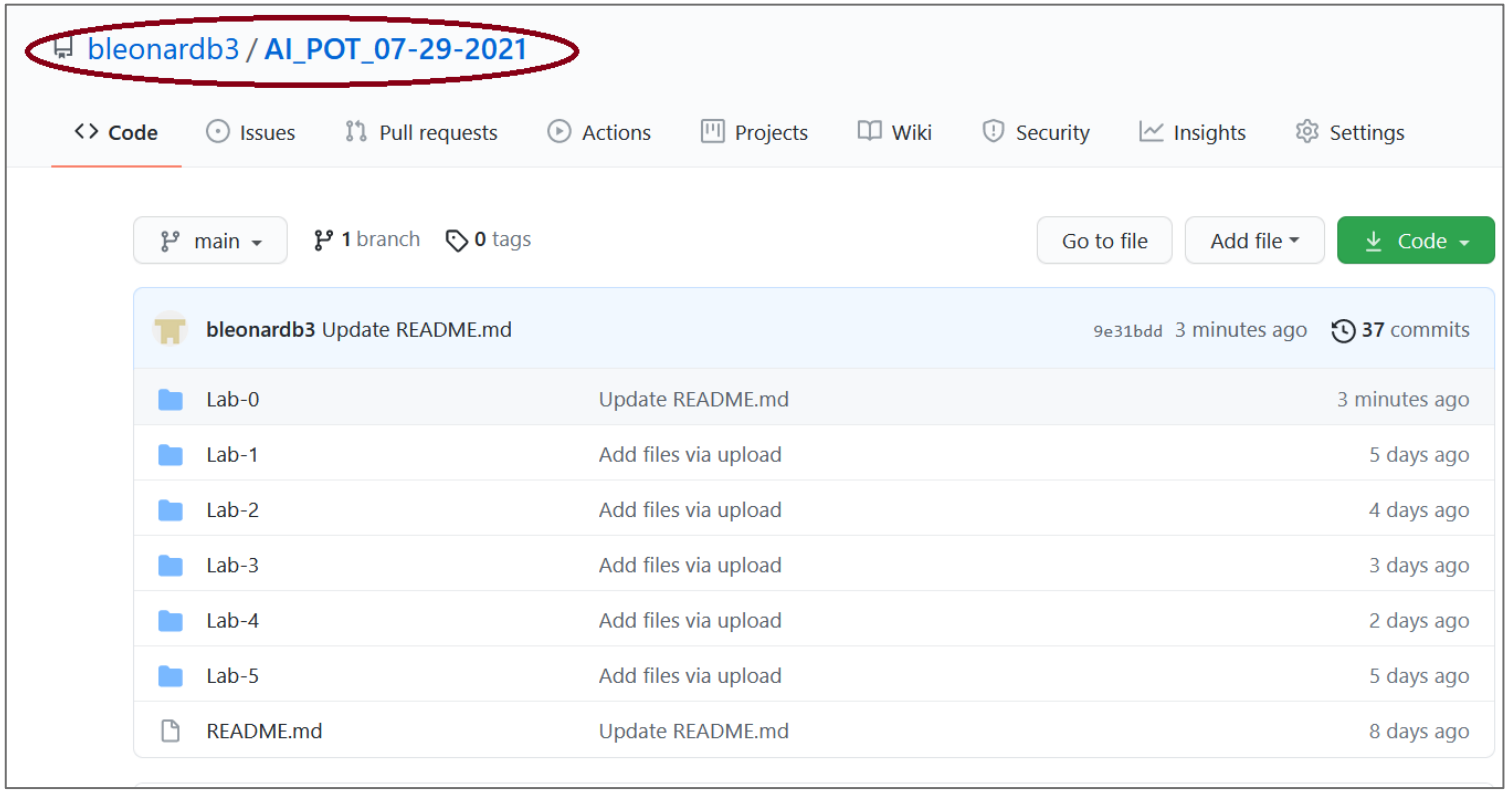
Lab Tips

- Labs are in www.github.com/bleonardb3/AI_POT_07-29-2021 repository.
- You will need an IBM Cloud account that has been activated for Watson Studio use. In case, you didn't have a chance to signup, the instructions are in the github repo.
- Instructions for each Lab are in the README file in the respective Lab folder.
- Cloud development enables making frequent improvements in the user interface. We reviewed the lab instructions and made screen updates so they should be pretty faithful to the user interface. Small differences may occur but shouldn't get in the way of successfully completing the labs.
- Use Firefox or Chrome browsers. Do not use Internet Explorer or Edge as the browser. For Mac users do not use Safari.

Lab Tips

- Do not create Knowledge Studio, Watson Discovery, Watson Assistant services in the Dallas Region/Location

Github Repository



Github Repository

Setup Watson Studio Environment

Introduction

This lab is a pre-requisite lab. It will set up the Watson Studio environment for subsequent labs and introduce you to the Project features of Watson Studio. Watson Studio is an integrated platform of tools, services, data, and meta-data to help companies and agencies accelerate their shift to be data driven organizations. The platform enables data professionals such as data scientists, data engineers, business analysts, and application developers collaboratively work with data to build, train, deploy machine learning and deep learning models at scale to infuse AI into business to drive innovation. Watson Studio is designed to support the development and deployment of data and analytics assets for the enterprise.

Objectives:

Upon completing the lab, you will have:

1. Created a project

Step 1. Please click on the link below to download the instructions to your machine.

Instructions.

Lab 0: Setup Watson Studio Environment

Lab-0: Setup Watson Studio Environment

Introduction

This lab is a pre-requisite lab. It will set up the Watson Studio environment for subsequent labs and introduce you to the Project features of Watson Studio. Watson Studio is an integrated platform of tools, services, data, and meta-data to help companies and agencies accelerate their shift to be data driven organizations. The platform enables data professionals such as data scientists, data engineers, business analysts, and application developers collaboratively work with data to build, train, deploy machine learning and deep learning models at scale to infuse AI into business to drive innovation. Watson Studio is designed to support the development and deployment of data and analytics assets for the enterprise.

Objectives:

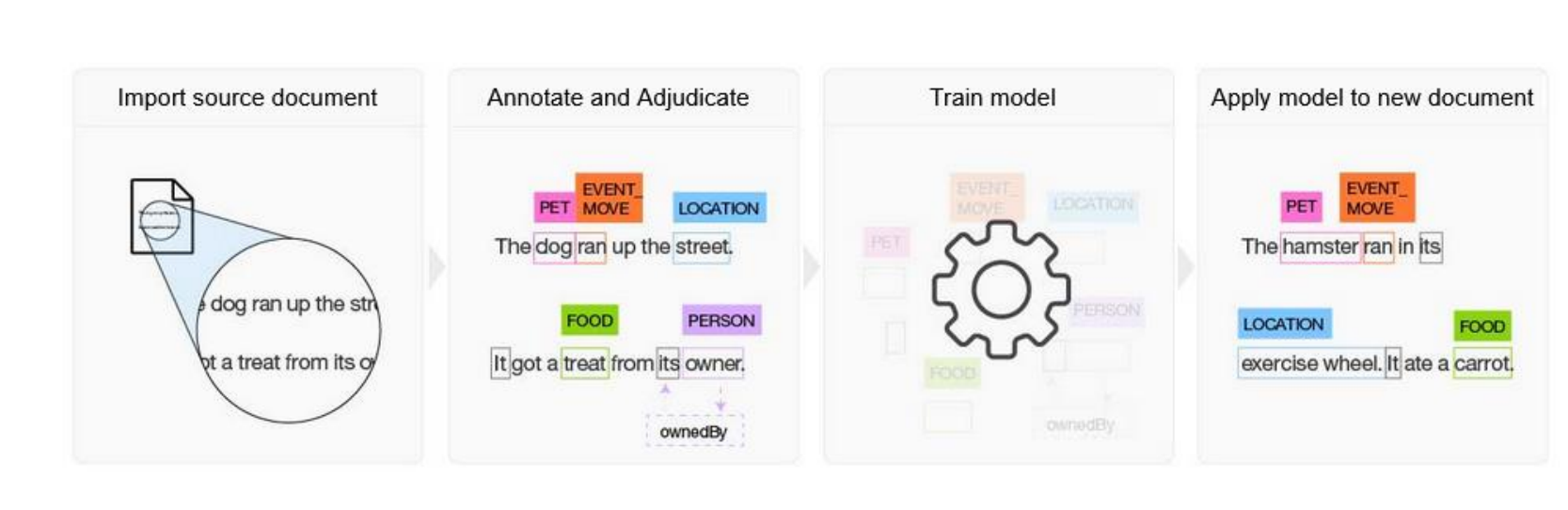
Upon completing the lab, you will know how to:

- Create a project

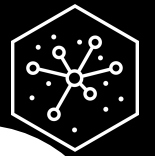
Cloud Pak for Data

Please work on Lab-0. We will return at 10:45 am EST for a brief introduction to the next lab.

Lab 1 – Watson Knowledge Studio



Lab-1: Watson Knowledge Studio



Introduction

In this lab, you will use Watson Knowledge Studio to develop socioeconomic annotators for COVID-19.

Objectives:

Upon completing the lab, you will know how to:

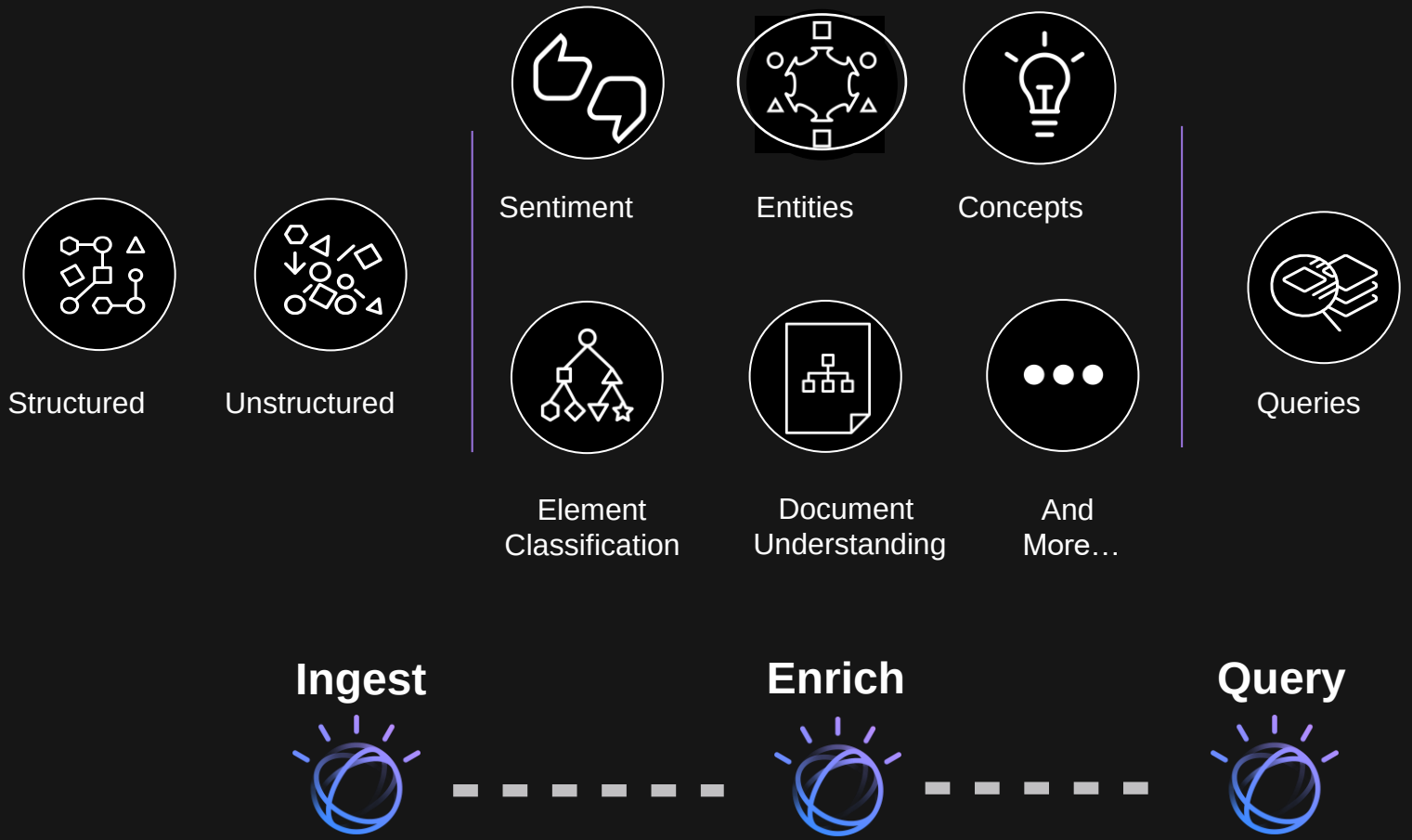
- Create and edit a type system
- Create a dictionary for each entity type
- Upload a training corpus
- Perform manual annotation
- Train and create a machine learning (ML) annotator
- Save and deploy the ML annotator to Watson Discovery

Tip: Make sure you DON'T create Knowledge Studio and Watson Discovery service in Dallas

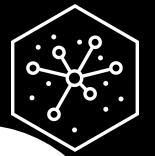
Cloud Pak for Data

Please work on Lab-1. We will return at 12:00 pm EST for a brief introduction to the next lab.

Lab 2: Watson Discovery


Structured
Unstructured
Sentiment
Entities
Concepts
Element Classification
Document Understanding
And More…
Queries
Ingest
Enrich
Query

Lab-2: Watson Discovery



Introduction

In this lab, you will use Watson Discovery to develop a knowledge management system (KMS), train the KMS to generate knowledge and analyze information to create a COVID-19 vulnerability index.

Objectives:

Upon completing the lab, you will know how to:

- Create a collection and upload data
- Add the entity model from Knowledge Studio
- Perform custom entity extraction
- Retrieve the analyzed files using the Discovery API
- Calculate the COVID-19 vulnerability index
- Perform Smart Document Understanding on a COVID-19 publication
- Create and run Natural Language Queries
- Use relevancy training to improve the relevance of results

Cloud Pak for Data

Please work on Lab-2. We will return at 1:45 pm EST for a brief introduction to the next lab.

Lab 3: Watson Assistant

Watson **Assistant**

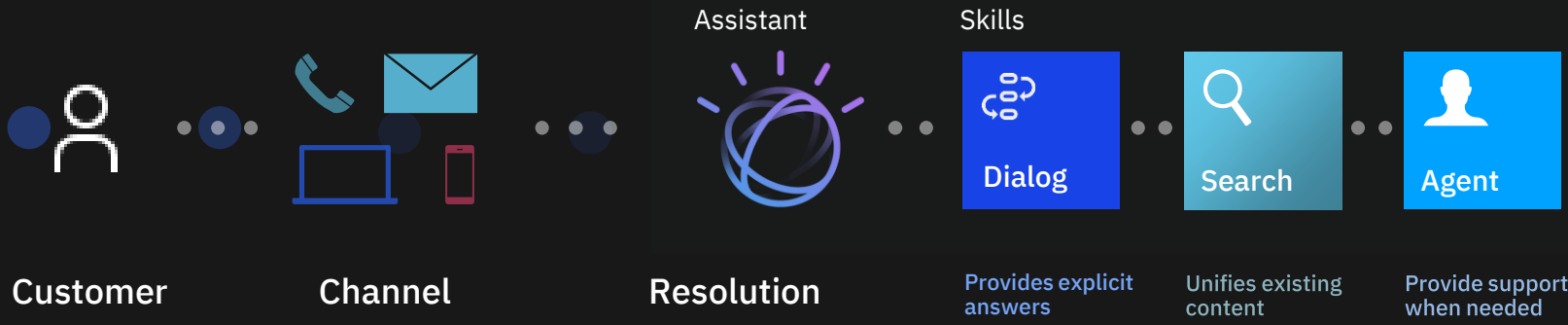
is the AI-powered foundation of smart customer experience.

Centralize your customer communication and problem resolution

Get started fast with your existing logs and web content

Go live without needing a developer

Dynamically manage vague questions



Lab-3: Watson Assistant

Introduction:

This lab will build a chatbot to respond to questions about COVID-19. Watson Assistant and Watson Discovery services from IBM will be used to build the chatbot.

Objectives:

The goal of this lab is to familiarize the user with the Watson Assistant service. Watson Assistant is IBM's AI offering that lets you build, train, and deploy conversation interactions into any application, device, or channel. Watson Assistant can be deployed on any cloud or on-premises environment.

After completing this lab, you will be familiar with these features of Watson Studio.

- Provision an instance of Watson Assistant Trial
- Add a dialog skill to your Watson Assistant instance
- Connect your Watson Assistant with Watson Discovery
- Create Cloud Functions
- Integrate data sources via a Watson Assistant webhook

Cloud Pak for Data

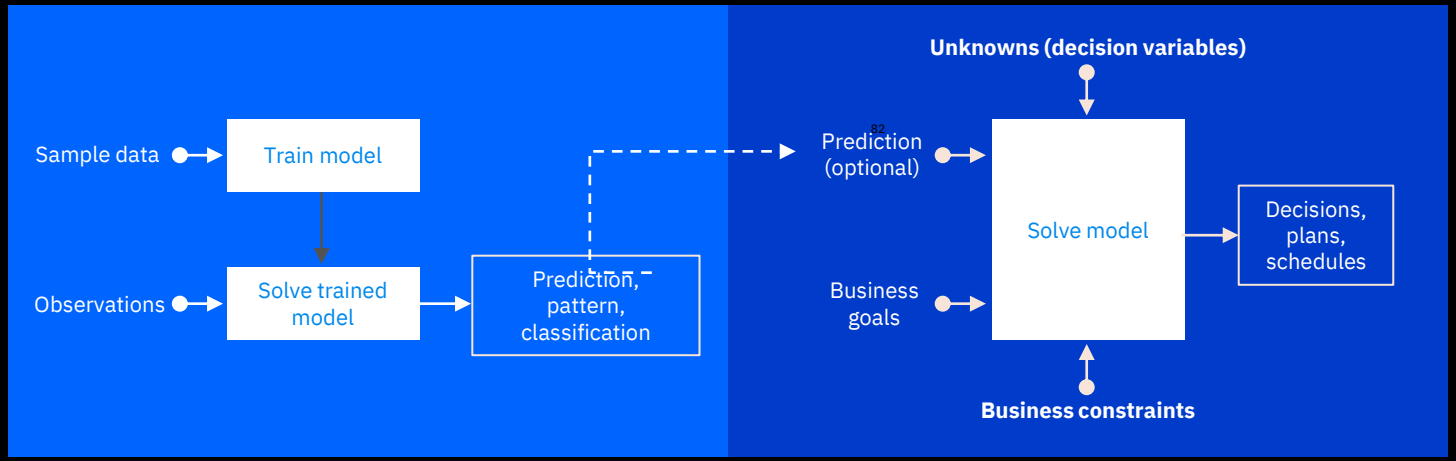
Please work on Lab-3. We will return at 2:45 pm EST for a brief introduction to the next lab.

Lab 4: Predictive Analytics+ Decision Optimization

Machine Learning and Optimization
Better together

Predictive analytics
- Basic (supervised): You **know the answer**, and you **train the machine how to find it**.
- Advanced: Unsupervised, reinforcement, deep learning

Prescriptive analytics
- You **don't know the answer**, and you **provide the machine the logic on what is a good and a bad solution**.
- Advanced: Robust, stochastic, etc



Lab-4: Watson Studio
Predictive Analytics + Decision Optimization

Introduction:

This lab will apply predictive analytics to analyze different factors among people to predict future COVID-19 infection rates in an area. Based on areas predicted to have high COVID-19 infections – this lab will apply optimization techniques to optimize the planning of transferring COVID-19 patients from hospitals located in epidemic areas to hospitals with less COVID-19 patients. Our hope is to educate people how to apply IBM's predictive and optimization technologies to help them improve planning and responding to COVID-19 cases.

Objectives:

The goal of this lab is to educate user on how to apply IBM predictive analytics and optimization tools to different applications of COVID-19 like (1) predicting future infections and (2) optimizing response for better decision making. We intend students learn these skills.

- Load data from different places to be used for analysis
- Represent the current situation on a map using folium
- Use a Linear Regression to predict new cases to come for each department
- Use Decision Optimization to model and optimize plan transfers
- Use folium to display the optimized future patient transfers plan

Cloud Pak for Data

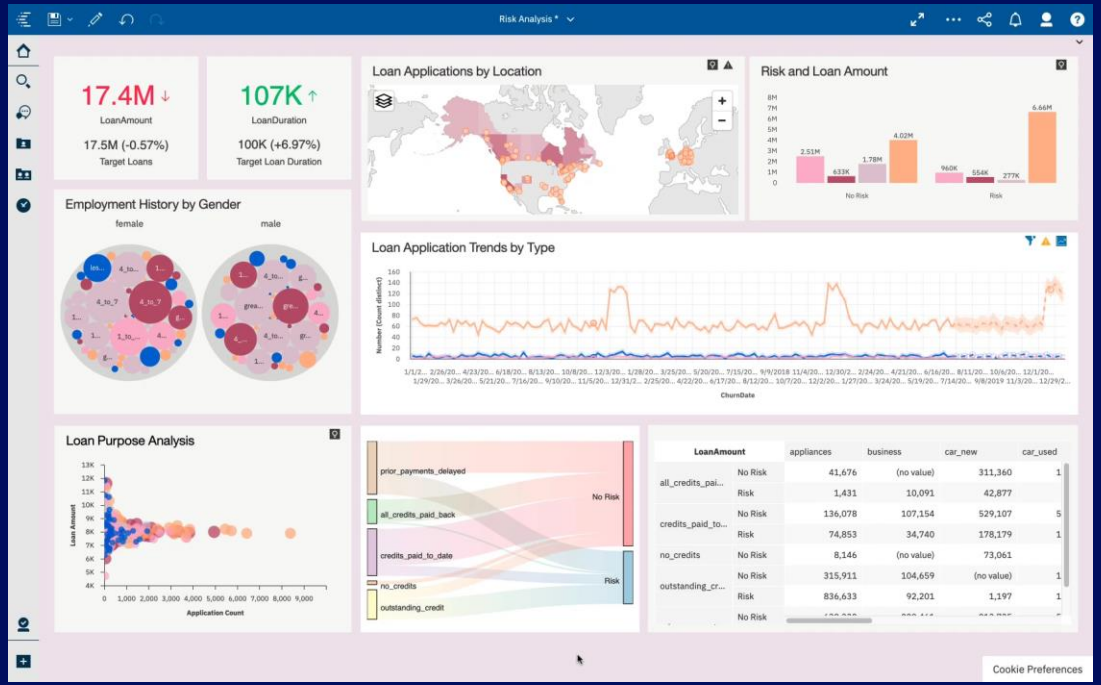
Please work on Lab-4. We will return at 3:45 pm EST for a brief introduction to the next lab.

Lab 5 Intro – Cognos Dashboard Embedded

Cognos Analytics

Cognos Analytics is self-service analytics, infused with AI and machine learning.

- Enables you to create stunning visualizations to share your findings through *dashboards* and *reports*
- These can be embedded (infused) into your applications
- The Cognos Analytics service makes it easier for you to extract meaning from your data with features such as:
  - **Automated data preparation**
  - **Automated modeling**
  - **Automated creation of visualizations and dashboards**
  - **Data exploration**

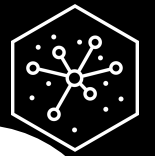


Weather API

Tracking Global Progression of COVID-19

- Data collected from API:
  - –Total cases up to May 20th
  - –New cases added each day
  - –Total Deaths up to May 20th
  - –New deaths added per day
- Sourced from WHO, U.S. state and country government sources

Lab-5: Cognos Dashboard Embedded: COVID-19 Dashboard



Introduction:

This lab will build a Cognos Dashboard Embedded dashboard to display COVID-19 data.

Objectives:

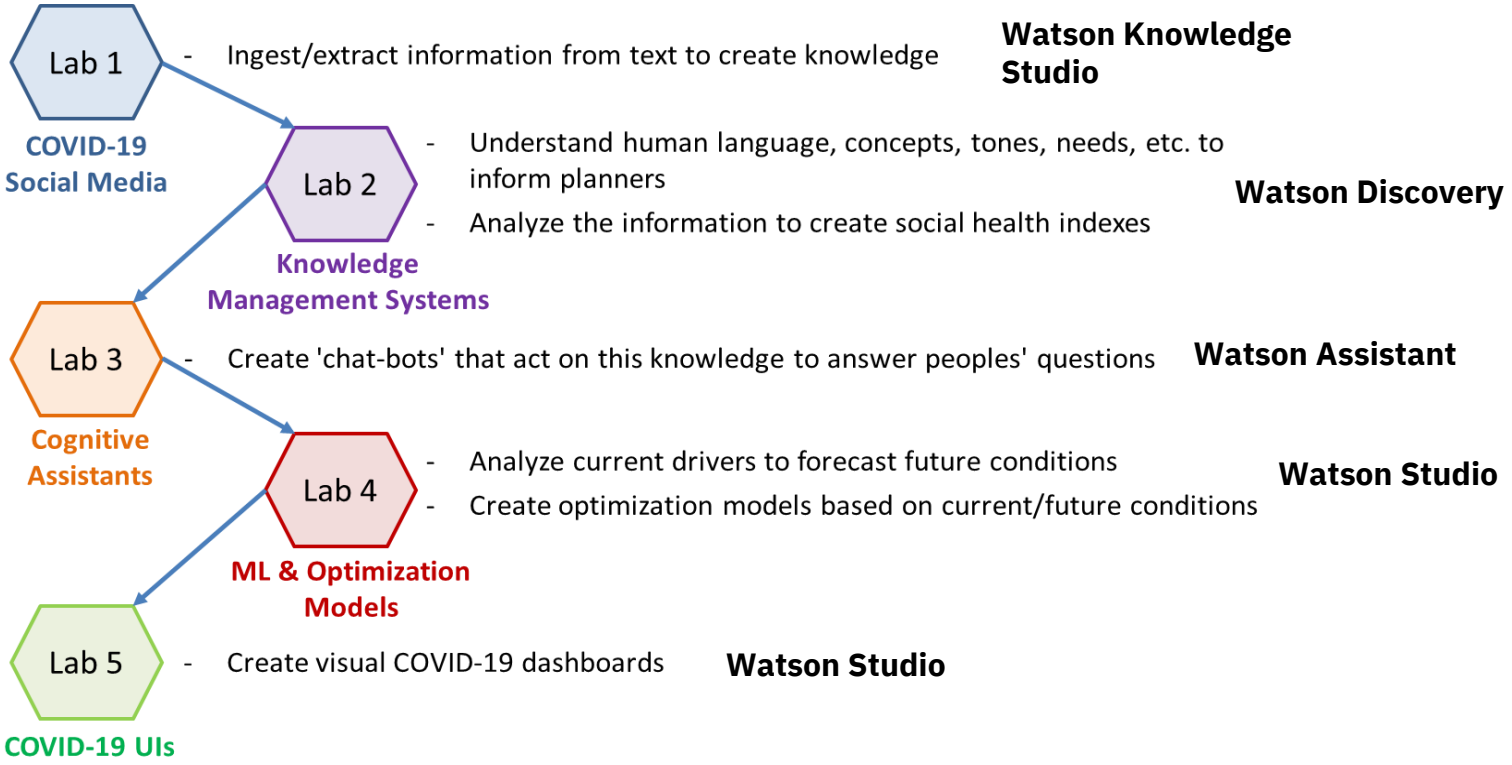
The goal of the lab is to familiarize the user with the use of the Cognos Dashboard Embedded service within Watson Studio. We will be creating a dashboard similar to one on the IBM & Weather Channel COVID-19 Dashboard. IBM created a data fabric pulled from state and local governments as well as the World Health Organization. We will use an extracted data table for the lab to build visualizations for a specific set of dates. After completing this lab, you will be familiar with building dashboards using the Cognos Dashboard Embedded service in Watson Studio.

Cloud Pak for Data

Please work on Lab-5. We will return at 4:30 pm EST for a wrap-up.

Workshop Goals

Apply Analytics and AI to COVID-19 use case



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