

# **IBM Watson Studio**

## Overview

March 2018



Machine Learning is algorithm selection

Deep learning is neural network design

AI is systems architecture

# Why are enterprises struggling to capture the value of AI?

## Data

- Data resides in silos & difficult to access
- Unstructured and external data wasn't considered

## Governance

- If the data isn't secure, self-service isn't a reality
- Challenge understanding data lineage and getting to a system of truth

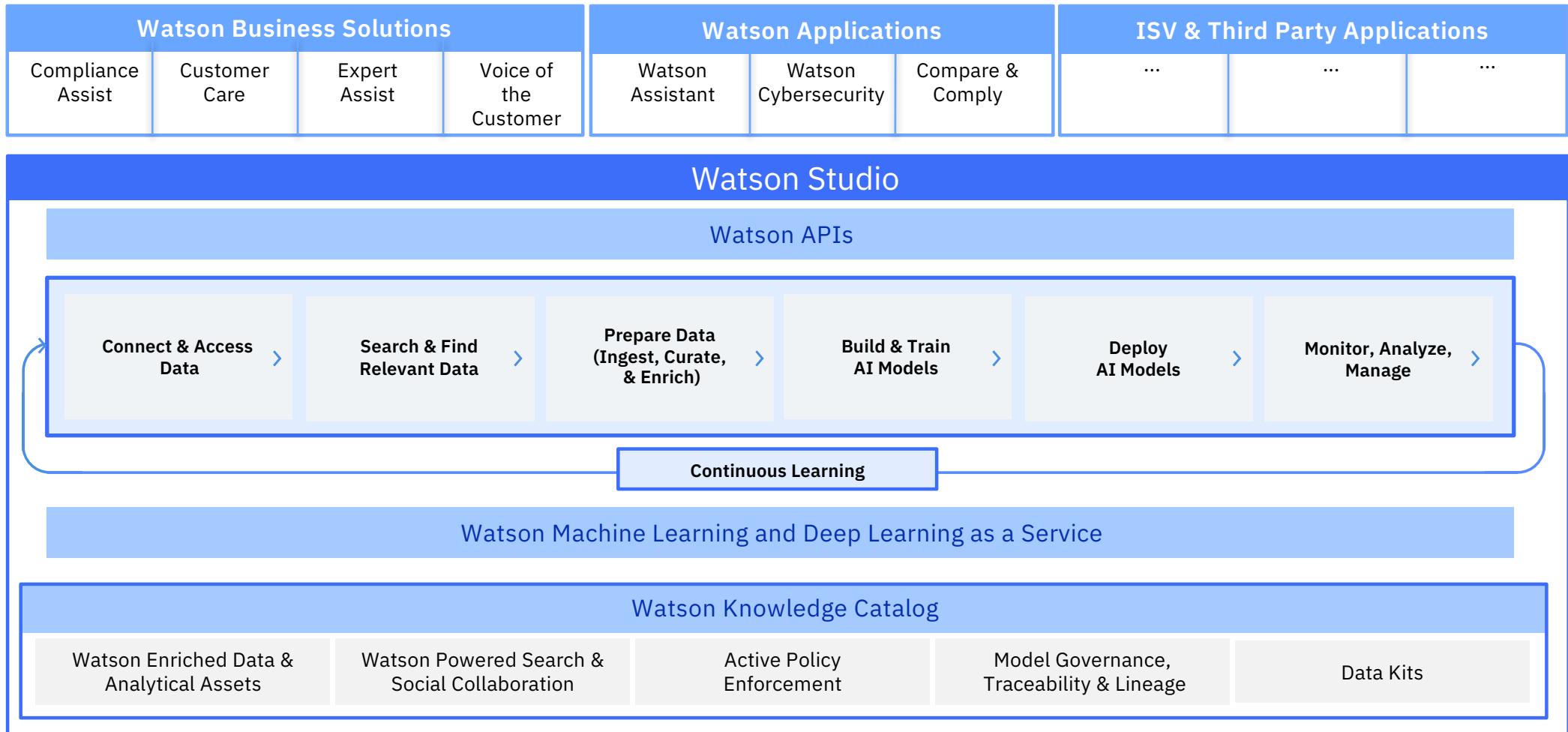
## Skills

- Data Science skills are in low supply and high demand
- Nurturing new data professionals is challenging

## Tools & Infrastructure

- Need an environment that enables a “fail fast” approach
- Discrete tools present barriers to productivity

# Watson: AI for Smarter Business



## **Watson Studio**

Watson Studio accelerates the machine and deep learning workflows required to infuse AI into your business to drive innovation. It provides a suite of tools for data scientists, application developers and subject matter experts to collaboratively and easily work with data and use that data to build, train and deploy models at scale.

## **AI Requires Teamwork**

- AI is not magic
- AI is **algorithms + data + team**

# Watson Studio

Built for AI teams – enabling team productivity and collaboration



**Tanya**  
Domain Expert

**Her Job:**

To transfer knowledge to Watson for a successful user experience.

**What she does:**

- Range of domain knowledge and uses that to teach Watson and develop a custom models
- As Tanya gains more experience she optimizes her knowledge to teach Watson to design better end-user experiences.

**Sometimes known as:**

Subject matter expert, content strategist.



**Mike**  
Data Scientist

**His Job:**

Transform data into knowledge for solving business problems.

**What he does:**

- Runs experiments to build custom models that solve business problems.
- Use techniques such as Machine Learning or Deep Learning and works with Tanya to validate success of trained models.

**Sometimes known as:**

ML/DL engineer, Modeler, Data Miner



**Ed**  
Data Engineer

**His Job:**

Architects how data is organized and ensures operability

**What he does:**

- Builds data infrastructure and ETL pipelines. Works with Spark, Hadoop, and HDFS.
- Works with data scientist to transform research models into production quality systems.

**Sometimes known as:**

Data infrastructure engineer



**Deb**  
The Developer

**Her Job:**

Builds AI application that meet the requirements of the business.

**What she does:**

- Starts PoCs which includes gathering content, dialog building and model training
- Focus is on app building for the team or company to use. Will handle ML Ops as needed

**Sometimes known as:**

Front-end, back-end, full stack, mobile or low-code developer

# Watson Studio

## Supporting the end-to-end AI workflow

### Connect & Access Data

**Connect** and discover content from multiple data sources in the cloud or on premises.

Bring **structured** and **unstructured** data to one toolkit.

### Search and Find Relevant Data

**Find** data (structured, unstructured) and AI assets (e.g., ML/DL models, notebooks, Watson Data Kits) in the **Knowledge Catalog** with intelligent search and giving the right access to the right users.

### Prepare Data for Analysis

Clean and prepare your data with **Data Refinery**, a tool to create data preparation pipelines visually.  
Use popular open source libraries to prepare unstructured data.

### Build and Train ML/DL Models

**Democratize** the creation of ML and DL models. Design your AI models **programmatically** or **visually** with the most popular **open source** and IBM ML/DL frameworks or leverage transfer learning on **pre-trained** models using **Watson tools** to adapt to your business domain. Train at scale on **GPUs** and **distributed** compute

### Deploy Models

Deploy your models easily and have them **scale automatically** for online, batch or streaming use cases

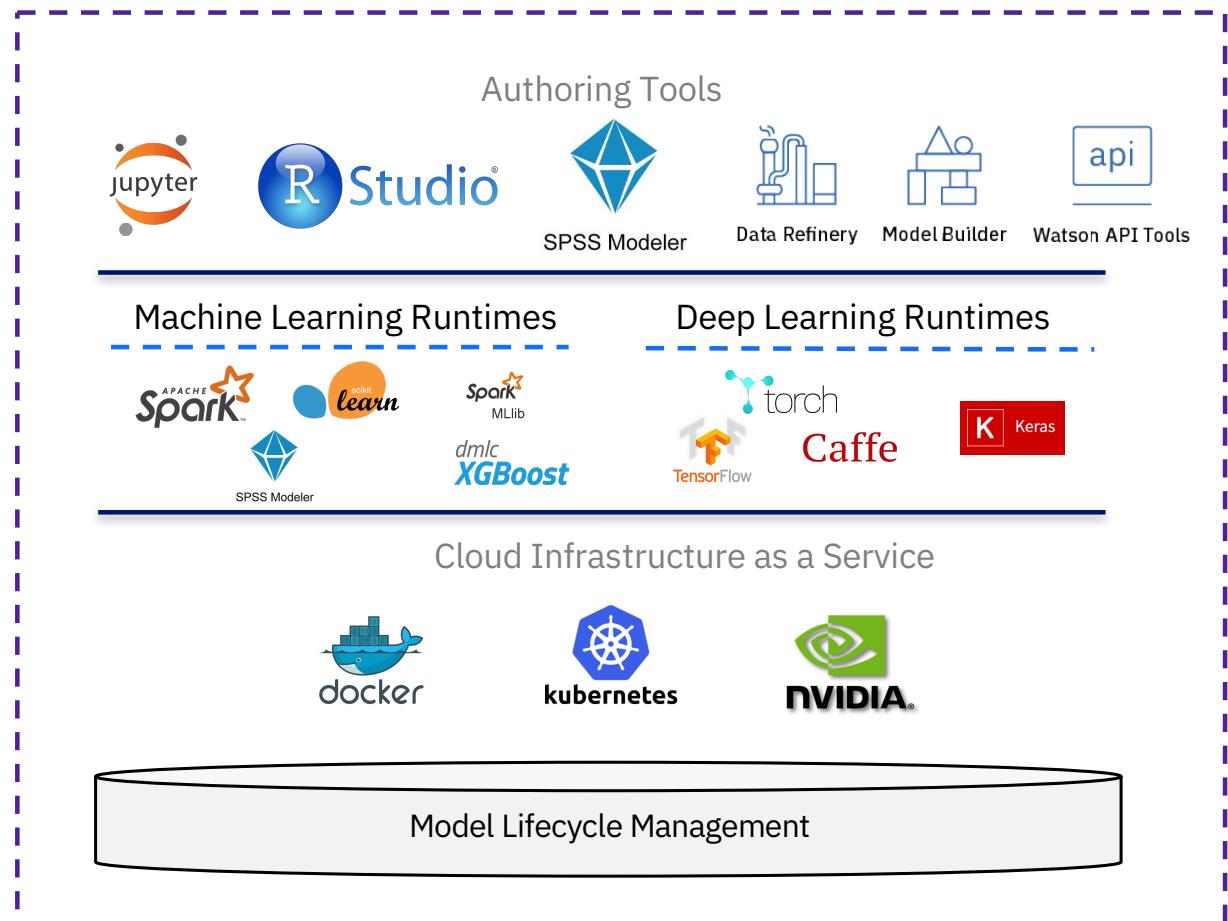
### Monitor, Analyze and Manage

Monitor the performance of the models in production and trigger automatic retraining and redeployment of models. Build **Enterprise Trust** with Bias Detection, Mitigation Model **Robustness** and Testing Service Model **Security**.

# Watson Studio

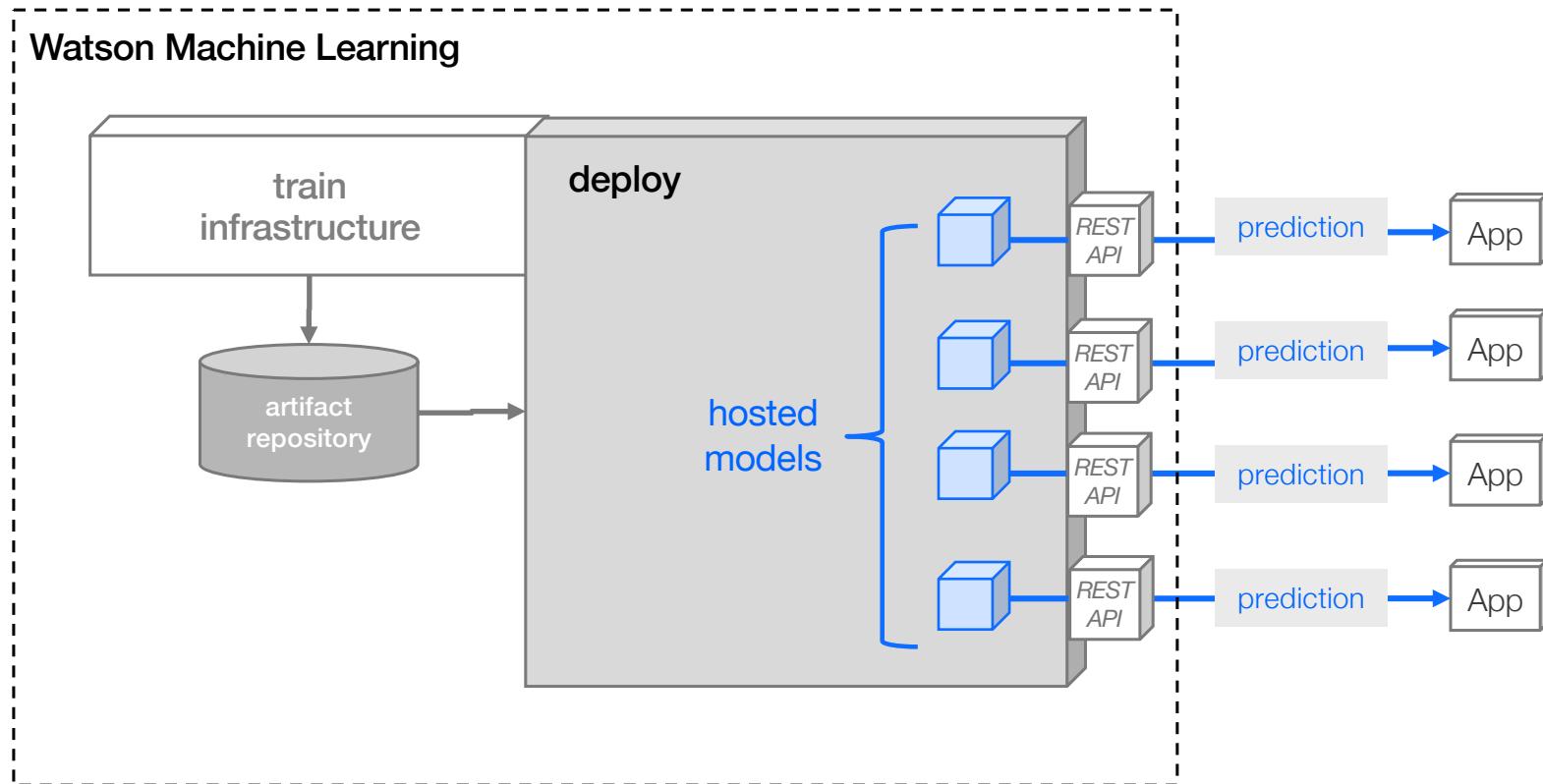
## Tools for supporting the end-to-end AI workflow

- Create, collaborate, deploy, and monitor
  - Best of breed open source & IBM tools
  - Code (R, Python or Scala) and no-code/visual modeling tools
- 
- Most popular open source frameworks
  - IBM best-in-class frameworks
- 
- Fully managed service
  - Container-based resource management
  - Elastic pay as you go cpu/gpu power



# Deploying Trained Models

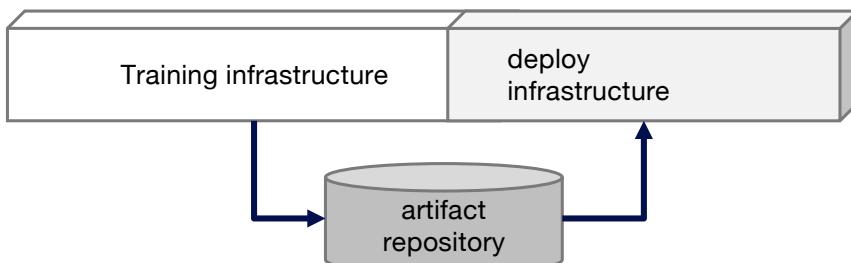
Download your trained models or deploy your models within Watson Machine Learning



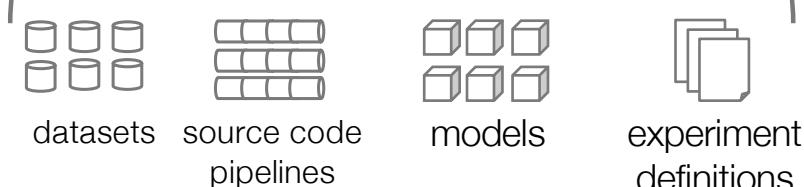
# AI Asset Lifecycle Management

Use the Watson Knowledge Catalog and Watson Studio to manage your AI assets or manage them yourself

## Watson Machine Learning



## Watson Knowledge Catalog



### Model Explanations

In May 2018, the General Data Protection Regulation (GDPR) takes effect and grants consumers the legal “right to explanation” from organizations that use algorithmic decision making.

### Audit Trails

Tracking prediction to each model’s unique heritage is critical to regulatory compliance. Enforcing access controls for model sharing and deployment ensure ensures data security and application stability.

# Watson Studio

## Differentiating Capabilities

### Integrated Collaboration Environment

- Data Scientists, Subject Matter experts, Business Analysts & Developers all in one environment to accelerate innovation, collaboration and productivity
- Built-in learning to get started or go the distance with advanced tutorials

### Choice of Tools for the full AI lifecycle

- Best in-breed open source and IBM tools that support the end-to-end AI lifecycle
- Choice of code or no-code tools to build and train your own ML/DL models or easily train and customize pre-trained Watson APIs

### Support for all levels of expertise

- Use Watson smarts and recommendations for the best algorithms to use given your data, OR
- Use the rich capabilities and controls to fine tune your models

### Experiment centric DL workflow

- Monitor batch training experiments then compare cross-model performance without worrying about log transfers and scripts to visualize results.
- You focus on designing your neural networks. We'll manage and track your assets.

### Model lifecycle & management

- Deploy models into production then monitor them to evaluate performance.
- Capture new data for continuous learning and retrain models so they continually adapt to changing conditions.

### Integrated with Knowledge Catalog

- Intelligent discovery of data and AI assets that enables reuse & improves productivity
- Seamlessly integrated for productive use with Machine Learning and Data science
- Powerful governance tools to control and protect access to data

# Watson Studio

*Inject AI on your business*

## Making AI a **Team Sport**

### Learn

Built-in learning to get started or go the distance with advanced tutorials

- Community with free sample Notebooks, Models, Open Data Sets to import and start working right away.
- Learn with hundreds of tutorials and get informed about the latest techniques with articles
- Share and bookmark your favorite community assets

### Create

The best of open source and IBM Watson tools to create state-of-the-art data products

- Code in Python, R and Scala in Jupyter Notebooks or Rstudio.
- Access the most popular ML & DL frameworks.
- Create Models and design neural networks in minutes without coding with Visual Modeling tools.
- Start with Watson pre-trained models and customize them with your own data
- Create compute environments on demand and scale/customize them as needed.

### Collaborate

Community and social features that provide meaningful collaboration

- Create Projects and add your colleagues to it to work all together
- Control the permissions with Admin/Editor/Viewer access
- Add comments and track the activity of your colleagues in Projects
- Track the workflow from experimentation to production
- Version control of your assets
- Data Scientists, Subject Matter experts, Developers all in one environment to accelerate innovation and collaboration

# Watson Studio

This screenshot shows the Jupyter Notebook interface within Watson Studio. A code cell contains Python code to generate a bar chart titled 'Tweets Country Distribution based on the User Profile'. The chart displays the number of tweets for various countries. The output of the code is a bar chart with 'GERMANY' having the highest count, followed by 'MEXICO', 'CANADA', 'INDIA', 'JAPAN', and 'SPAIN'. A comment from user 'ARMAND RUIZ G...' says 'Great work!'. The interface includes standard Jupyter Notebook controls like Run, Cell, Kernel, and Help.

Open Source tools – Jupyter and RStudio

This screenshot shows the 'Environments' section of Watson Studio. It allows users to define hardware size and software configuration for runtime associated with DSX tools such as notebooks. It includes a search bar, a table for active environment runtimes (which currently has none), and a table for environment definitions. A specific entry for 'Default SPSS Modeler XS' is shown, using 'Wml\_flow' as the tool with '2 vCPU and 8 GB RAM' configuration, last modified on 2 Mar 2018.

Elastic and customizable compute environments

This screenshot shows the Watson Visual Recognition interface. It displays a 'Car recognition' project with 49 classes. A sidebar lists various car models with their image counts: AMGeneralHummerS... (89 images), AcuraTSXSedan2012 (81 images), AcuraIntegraTypeR2... (89 images), AcuraTLSDelan2012 (86 images), AstonMartinV8Vanta... (82 images), Audi100sedan1994 (81 images), and AstonMartinV8Vanta... (90 images). A central area shows a grid of car images for training. A file browser on the right lists several ZIP files containing image datasets. A 'Train Model' button is visible at the top right.

Watson Visual Recognition – retrain Watson

This screenshot shows the ML flows interface within Watson Studio. It displays a visual workflow for creating a convolutional neural network. The flow starts with 'Image Data' input, followed by 'Conv 2d', 'ReLU', and 'Pooling 2d' layers. The output then branches into 'Flatten', 'Dense', 'Softmax', and 'Accuracy' nodes. Finally, it ends with 'Sigmoid Cross-E...' and 'SGD' nodes. A blue line highlights the connection between the 'Softmax' and 'SGD' nodes.

Create ML flows and design Neural Networks visually

# Watson Knowledge Catalog

*Unlock tribal knowledge and unleash your knowledge workers*

An **intelligent asset catalog** for a 360 degree view of your data & AI assets

## Discover

Intelligent discovery of data and AI assets with advanced classification and profiling to provide context

- Intelligent data classification and profiling that determines what the data is and how it should be used
- Quickly build a 360 view of all assets and provide them for AI and Analytics
- Crawlers to auto discover usage information of data to understand how data is used

## Catalog

A rich metadata index of all data and AI assets with social collaboration and enhanced findability

- A business friendly shopping portal for your enterprise data
- Integrated with other platform solutions to facilitate self service analytics and AI
- Access controls and security
- Seamlessly integrated for productive use with Data prep, movement, dashboarding, Machine learning and Data science

## Activate

Powerful governance tools to control and protect access to data with visibility to data use

- Business Glossary to define business terms and map them to technical assets
- Policy Engine to author, activate and enforce business policies and rules
- Governance and Insights dashboards to understand how data is used and how the governance program is impacting it

# Watson Knowledge Catalog

Unlock tribal knowledge and unleash your knowledge workers

Browse Assets Usage Statistics Access control Settings

What assets are you looking for?

Recently Added

- Data Asset US Airlines
- Data Asset Harry Rosen example
- Notebook Machine Learning using R
- Data Asset FDIC Failed Bank List
- Data Asset 2017 Small Business Banking Loan s
- Data Asset All US Banki

Sales Forecast

Filter

Asset types

- Data Asset (56)
- Notebook (4)
- Connection (2)
- dashboard (2)

Tags

- discovered (24)
- SAMPLES (11)
- untagged (8)
- GOSALES (6)
- sales (5)
- banking (4)
- dix (4)
- notebook (4)
- GOSALESDW (3)

Available Assets

Showing 64 of 64 assets

NAME :	OWNER	TAGS	TYPE	DATE ADDED
2017 Small Business Banking Loans	Jay Limbun	banking loan	Data Asset	19 Feb 2018
ANCESTRY	Jay Limbun	discovered: SAMPLES	Data Asset	13 Dec 2017
AWS Data Warehouse	Jay Limbun		Connection	13 Dec 2017
All US Banking Branches	Jay Limbun	fss: banking: branches	Data Asset	19 Feb 2018
Banking Demographic Data	Jay Limbun	banking client: customer	Data Asset	19 Feb 2018
BlocPower_Tcsv	paul taylor		Data Asset	22 Jan 2018
CONVERSION_RATE	Jay Limbun	discovered: GOSALES	Data Asset	13 Dec 2017
COUNTRY	Jay Limbun	discovered: GOSALES	Data Asset	13 Dec 2017
CUST_WIN_BACK	Jay Limbun	discovered: SAMPLES	Data Asset	13 Dec 2017
Customer Orders Q3	Jay Limbun	sales: Warehouse	Data Asset	11 Jan 2018

board

Data assets containing personal or restricted data

Personality Identifiable Info... ①

10 View all

Operational policies ①

13 Data Governance Policies

16 Data Governance Rules

Automatic enforcement ①

1801 Items in March 2018  
▲ 201.68% from last month

Policy enforcements over time ①

Feb 7, 2018 - Mar 7, 2018

Month ▾

Enforcements Operational Policies

Browse Assets Usage Statistics Access control Settings

Total assets ①

Connections	56	Data Assets	4	Notes	2	Other	64 Total
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Deleted assets ①

Showing MAR 2017 - MAR 2018 >

Added assets ①

Showing MAR 2017 - MAR 2018 >

Assets accessed ①

March 2018

Business Glossary / MyCo Confidential

Overview Related content

MyCo Confidential

All confidential data for our entire knowledge set

Term details

Creator: jay@uk.ibm.com  
Date created: 29 Sep 2017  
Last editor: IBMfd-2700028UJU  
Last modified: 7 Mar 2018

Owner Jay Limbun

Tags Compliance | Protection

Associated classifier or term Confidential

Views over time

Feb 9, 2018 - Mar 5, 2018

Month ▾

Number of views

Description

A term used by Great Outdoors to classify any information that should not be disclosed outside of the Great Outdoors company.

5

# Data Refinery

*Making data fit for use*

## Simplifying Data Preparation to Accelerate Data Insights

### Connect

Access to your data regardless of where it resides

- Support for cloud and on-premises data
- 33+ connectors to IBM, non IBM and third party data sources
- Support for Files, Relational, No SQL and Hadoop data sources...
- Shared connections across all Watson Data Platform experiences
- Seamless integration with Data Catalog

### Wrangle

Profile, shape and cleanse data and make it fit for use

- Intuitive self-service interface for data exploration, visualization and refinement
- Combine data from multiple sources
- Profile, classify and enrich data
- Robust set of data transformation functions for the non-technical and technical user
- No coding or technical ETL skills required

### Deploy

Operationalize for repeatability, scalability and monitoring

- Visual creation, modification and reuse of data flows
- Scheduling of data flow executions for repeatable outcomes
- Monitoring and notification of results
- Scale on demand to support any sized workload

# Data Refinery

## *Making data fit for use*

IBM Watson Projects Tools Community Services

My Projects / Data Preparation / Customer Orders\_Flow / Data Refinery

**+ Operation** Code an operation to cleanse and shape your data

	DATA	PROFILE	OPERATIONS						
1	TRANSACTION String	arrange count	PRODUCT_TYPE String	CUST_ORDER_NUM String	COUNTRY String	STATE String	CITY String	GEN String	
2	TR19304	distinct	it	Sleeping Bags	179562	United States	SD	Aberdeen	Female
3	TR1537	filter	u...	Tools	170697	Australia	SA	Adelaide	Female
4	TR1790	group_by	es	Eyewear	177116	India	GJ	Ahmedabad	Female
5	TR3101	mutate	it	Tents	173945	United States	NY	Albany	Male
6	TR2045	mutate_all	it	Tents	174874	United States	CA	Alhambra	Female
7	TR3241	mutate_all	it	Cooking Gear	173181	United States	WI	Almena	Male
8	TR1764	mutate_all	it	Packs	171843	India	MP	Amravati	Male
9	TR3963	mountaineering_Equ...	it	Rock Climbing Equipment	174445	United States	AK	Anchorage	Female
10	TR2608	Camping Equipment	Tents		175833	United States	CO	Aurora	Male
11	TR1959	Personal Accessories	Watches		174729	United States	AZ	Bagdad	Female
12	TR4372	Personal Accessories	Eyewear		176195	India	HR	Bahadurgarh	Female
13	TR1640	Personal Accessories	Eyewear		170869	Canada	QC	Bale-Comeau	Female
14	TR1559	Personal Accessories	Binoculars		170732	Brazil	BR-SC	Balneario Cambori...	Female
15	TR4627	Mountaineering Equipment	Tools		177371	Spain	B	Barcelona	Male
16									

4 STEPS

Data Source : Great Outd...

Remove duplicates

Removed rows with duplicate values in STATE

Sort ascending

Sorted rows by CITY

Sort descending

Sorted rows by CUST\_ORDER\_NUMBER

Sort ascending

JUST ADDED

Sorted rows by CITY

**Self-service data refinement and cleaning**

IBM Watson Data Preparation

Customer Orders Flow / Data Refinery

+ Operation Code an operation to cleanse and shape your data

Data Profile Visualizations

CUST\_ORDER\_NUMBER String

COUNTRY String

STATE String

CITY String

FREQUENCY

Value	Frequency
337198	~5.5
337095	~5.5
336996	~5.5
336891	~5.0
336246	~5.0
336197	~5.0
336094	~5.0
334683	~5.0
337736	~5.0
336120	~5.0

FREQUENCY

Value	Frequency
United States	~1200
China	~700
Germany	~600
Japan	~550
South Korea	~500
United Kingdom	~450
France	~400
Canada	~400
Australia	~350
Spain	~300

FREQUENCY

Value	Frequency
WA	~5000
CA	~4500
IN	~4000
BR-AZ	~3500
NY	~3000
FL	~2500
ON	~2000
BR-SP	~1500
SA	~1000

FREQUENCY

Value	Frequency
Singapore	~150
England	~120
Malaysia	~100
Singapore	~100
Malaysia	~90
China	~80
Taiwan	~80
Indonesia	~70
Northern Ireland	~70
Denmark	~70
Wales	~70
Scotland	~70
Portugal	~70
Philippines	~70

STATISTICS

Statistic	Value
Maximum length	6

STATISTICS

Statistic	Value
Maximum length	6

STATISTICS

Statistic	Value
Maximum length	14

STATISTICS

Statistic	Value
Maximum length	9
Minimum length	1
Mean length	2.3778
Unique	100

Comprehensive profiling

The screenshot shows the IBM Watson Studio Data Refinery interface. On the left, there's a sidebar with tabs for '+ Operation' (selected), 'Data', 'Profile', and 'Visualizations'. The main area displays a treemap visualization where three categories—'Camping Equipment', 'Golf Equipment', and 'Mountaineering Equipment'—are shown as large blue rectangles. Each category is further subdivided into smaller rectangles representing countries: Australia, Canada, Italy, Spain, and the United Kingdom. Below the treemap, a large blue box contains the text 'Interactive visualization'. On the far right, there are several icons for navigation and settings.

The screenshot shows the IBM Watson Data Prep interface. At the top, there's a navigation bar with links for IBM Watson, Projects, Tools, Community, Services, US South, and various icons for user profile, notifications, and help. Below the navigation is a breadcrumb trail: My Projects / Data Preparation / Customer\_Orders\_flow. To the right of the breadcrumb are Refine, Play, and other workflow control buttons. The main area is titled "Summary". It displays a flow card for "Great Outdoor Customer Orders.csv" which consists of "3 Steps" and produces the output "Customer Orders\_shaped.csv". Below this is a "Runs" section with tabs for History and Schedule. The History tab shows a table of runs from March 6, 2018, to March 11, 2018, at 9:58 pm, with each run starting at 9:58 pm. The Schedule tab is currently selected and shows a repeating schedule starting on March 6, 2018, at 9:58 pm, with an interval of "Every 1 day" and ending on March 11, 2018, at 9:58 pm. A large blue callout box at the bottom left contains the text "Scheduling and monitoring".

# Watson Machine Learning

Simplifying deployment & management of ML models in production apps

## Embed AI in your Business

### Train

Train custom ML and DL models at scale

### Deploy

Move models into production where they improve and remain relevant

### Automate

Build better models faster while they continue to learn after

- Use your favorite tools and frameworks such as SPSS, Tensorflow, Keras, Scikit Learn or xgboost.
- Track the progress and performance of your training jobs with the Experiment Assistant interface.
- Create new models without writing a single line of code using the neural network modeler

- Portable models – deploy in the cloud, on devices or on premise
- Import models trained somewhere else and deploy in the cloud
- Transfer models to connected devices with support of Core ML, Tensorflow Lite
- Make millions of predictions in seconds

- Build better models faster with automatic parameter tuning
- Automate the retraining of models with our feedback loop capabilities
- Automate the deployment of models in products
- Automatic algorithm selection for ML models with our CADS technology from Research

# Watson Machine Learning

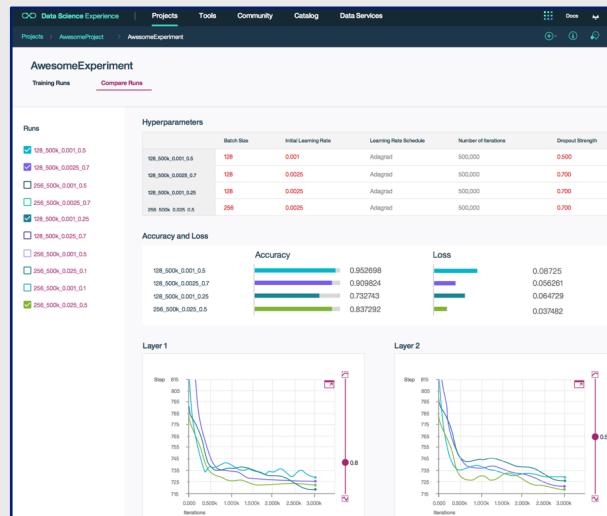
Simplifying deployment & management of ML models in production apps

Python client, command line interface (CLI) or UI? You choose the tooling that best fits your existing workflows. Training history and assets are tracked then automatically transferred to the customer's Object Storage for quick access.

The terminal window displays a log of training runs for a TensorFlow experiment named 'AwesomeExperiment'. The log shows various training steps and their status (e.g., completed, pending). The log ends with a message indicating all training runs have succeeded and lists the names of the completed runs.

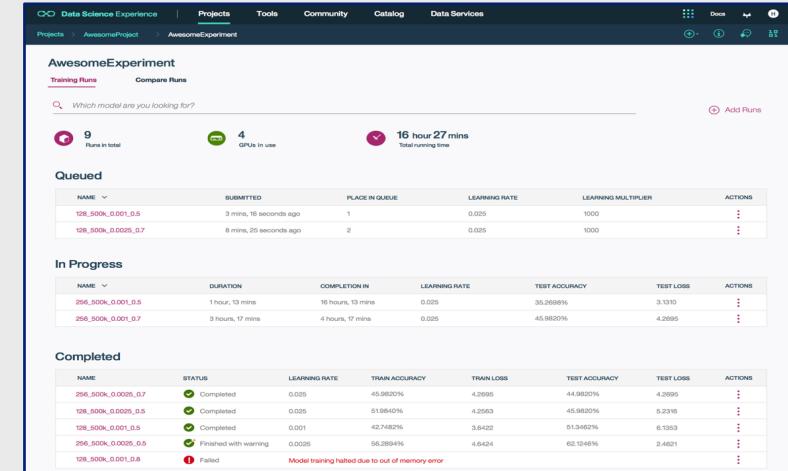
```
287 keras-fashion-cos (batch-45) training-A6f4P3kg completed tensorflow 2018-02-14T19:51:27Z
288 keras-fashion-cos (batch-46) training-1yPPV13kg pending tensorflow 2018-02-14T19:51:28Z
289 keras-fashion-cos (batch-58) training-9KvVqgk pending tensorflow 2018-02-14T19:51:28Z
290 keras-fashion-cos (batch-64) training-9KvVqgk pending tensorflow 2018-02-14T19:51:29Z
291 keras-fashion-cos (batch-65) training-9KvVqgk pending tensorflow 2018-02-14T19:51:29Z
292 keras-fashion-cos (batch-70) training-158VEt3kg completed tensorflow 2018-02-14T19:51:30Z
293 keras-fashion-cos (batch-71) training-158VEt3kg completed tensorflow 2018-02-14T19:51:30Z
294 keras-fashion-cos (batch-58) training-158VEt3kg pending tensorflow 2018-02-14T19:51:30Z
295 keras-fashion-cos (batch-61) training-158VEt3kg pending tensorflow 2018-02-14T19:51:30Z
296 keras-fashion-cos (batch-68) training-158VEt3kg pending tensorflow 2018-02-14T19:51:30Z
297 keras-fashion-cos (batch-79) training-158VEt3kg pending tensorflow 2018-02-14T19:51:30Z
298 keras-fashion-cos (batch-58) training-158VEt3kg completed tensorflow 2018-02-14T19:51:30Z
299 keras-fashion-cos (batch-67) training-158VEt3kg pending tensorflow 2018-02-14T19:51:30Z
300 keras-fashion-cos (batch-72) training-158VEt3kg pending tensorflow 2018-02-14T19:51:30Z
301 keras-fashion-cos (batch-66) training-6f4E4t3kg pending tensorflow 2018-02-14T19:51:33Z
302 keras-fashion-cos (batch-69) training-6f4E4t3kg pending tensorflow 2018-02-14T19:51:33Z
303 keras-fashion-cos (batch-51) training-Xbr4P3kR pending tensorflow 2018-02-14T19:51:34Z
304 keras-fashion-cos (batch-59) training-Xbr4P3kR pending tensorflow 2018-02-14T19:51:34Z
305 keras-fashion-cos (batch-60) training-Xbr4P3kR pending tensorflow 2018-02-14T19:51:34Z
306 keras-fashion-cos (batch-63) training-Xbr4P3kR pending tensorflow 2018-02-14T19:51:34Z
307 keras-fashion-cos (batch-71) training-Sp14Et3kg completed tensorflow 2018-02-14T19:51:36Z
308 keras-fashion-cos (batch-64) training-Sp14Et3kg completed tensorflow 2018-02-14T19:51:37Z
309 keras-fashion-cos (batch-66) training-B11P3qkR pending tensorflow 2018-02-14T19:51:39Z
310 keras-fashion-cos (batch-73) training-1M1P3qkR pending tensorflow 2018-02-14T19:51:40Z
311 keras-fashion-cos (batch-76) training-1M1P3qkR pending tensorflow 2018-02-14T19:51:42Z
312 keras-fashion-cos (batch-77) training-9H0nP3qkR completed tensorflow 2018-02-14T19:51:43Z
313 keras-fashion-cos (batch-74) training-dgh1P3qkR completed tensorflow 2018-02-14T19:51:44Z
314 keras-fashion-cos (batch-75) training-dgh1P3qkR completed tensorflow 2018-02-14T19:51:44Z
315 keras-fashion-cos (batch-57) training-k10P3qk pending tensorflow 2018-02-14T19:52:07Z
316 keras-fashion-cos (batch-78) training-Pw1HPzR pending tensorflow 2018-02-14T19:52:33Z
317 keras-fashion-cos (batch-70) training-Pw1HPzR pending tensorflow 2018-02-14T19:52:33Z
318 keras-fashion-cos (batch-69) training-24DPl32R pending tensorflow 2018-02-14T19:52:41Z
319 keras-fashion-cos (batch-61) training-JAsvp3kR pending tensorflow 2018-02-14T19:52:51Z
320 record found.
List all training runs successful!
List of training runs stored in ml list training-runs
Fetching the list of training runs ...
S1 No Name gold status framework submitted-at
1 keras-fashion-cos (batch-7) training-KonPap3zR pending tensorflow 2018-02-14T19:07:29Z
2 keras-fashion-cos (batch-6) training-fbm-P3zg pending tensorflow 2018-02-14T19:07:29Z
3 keras-fashion-cos (batch-12) training-1M1P3qkR pending tensorflow 2018-02-14T19:07:31Z
4 keras-fashion-cos (batch-3) training-JanPatqkR completed tensorflow 2018-02-14T19:07:31Z
5 keras-fashion-cos (batch-2) training-1M1P3qkR pending tensorflow 2018-02-14T19:07:31Z
6 keras-fashion-cos (batch-4) training-Md7E-t3kR completed tensorflow 2018-02-14T19:07:31Z
7 keras-fashion-cos (batch-1) training-Q-H-E-t3k pending tensorflow 2018-02-14T19:07:31Z
8 keras-fashion-cos (batch-10) training-7W0dat3kR pending tensorflow 2018-02-14T19:07:31Z
9 keras-fashion-cos (batch-11) training-7W0dat3kR completed tensorflow 2018-02-14T19:07:31Z
10 keras-fashion-cos (batch-18) training-TldapqkR completed tensorflow 2018-02-14T19:07:35Z
11 keras-fashion-cos (batch-12) training-1dE-t3k pending tensorflow 2018-02-14T19:07:35Z
12 keras-fashion-cos (batch-51) training-JAsvp3kR pending tensorflow 2018-02-14T19:52:51Z
```

Monitor batch training experiments then compare cross-model performance without worrying about log transfers and scripts to visualize results. You focus on designing your neural networks. We'll manage and track your assets.



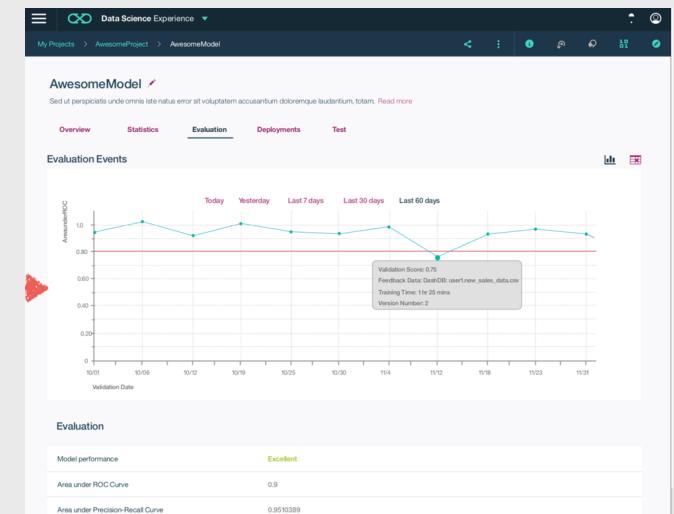
Train neural networks in parallel across NVIDIA GPUs.

Pay only for what you use. Auto-deallocation means no more remembering to shutdown your cloud training instances.



Deploy models into production then monitor them to evaluate performance.

Capture new data for continuous learning and retrain models so they continually adapt to changing conditions.



# IBM Analytics Engine

A flexible framework to deploy and manage Hadoop/Spark at scale

## Open

Open source stack based on industry leading Hadoop/Spark distribution

- Standard open source APIs to build and deploy portable applications on Spark and Hadoop components
- Integrate with other Hadoop and Spark ecosystem frameworks for advanced analytics use cases

## Scalable

Architecture based on separate compute and storage for enhanced scalability, reliability and cost efficiency

- Persist data in secure, scalable IBM Cloud Object Storage with options to replicate across regions
- Scale compute and storage independently for better economics
- Separate compute and storage ensure no data-loss in cases of cluster failure

## Flexible

Options to deploy analytics application and operationalize administration

- Spin up, within minutes, use case specific clusters using different instance sizes for different use cases
- Access and administer through multiple interfaces – Cloud Foundry CLI, REST APIs on public interface, and GUI
- Enhanced flexibility for configuring and clusters, including installing 3rd party libraries through bootstrap scripts

# IBM Analytics Engine

IBM Cloud

Data and Analytics / IBM Analytics Engine /

### Configure service instance

**Hardware configuration**

Default Number of compute nodes 1

4 vCPU, 16 GB RAM, 2 x 300 GB HDFS disk on each compute node

**Software package**

AE 1.0 Spark  AE 1.0 Spark and Hadoop

**Components**

- Apache Spark 2.1.1
- Apache Livy 0.3.0
- Anaconda-Py 2.7.13 and 3.5.2
- Oozie 4.2.0
- Hadoop 2.7.3
- Knox 0.12.0
- HBase 1.1.2
- Flume 1.5.2
- Jupyter Enterprise Gateway 0.6.0
- Ambari 2.5.2
- Hive 1.2.1
- Apache Phoenix 4.7

IBM Cloud

Data & Analytics / Analytics Engine-k2

Location: US South Org: rvaldya@us.ibm.com Space: dev

**Dashboard**

Status: Active

Compute Nodes: 2

Price Estimate: \$ 0/mo

**Cluster overview**

User name: cladmin  
Password:   
Software package: AE 1.0 Hadoop and Spark

**Launch Console**

IBM Cloud

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### Analytics Engine-k2

Location: US South Org: rvaldya@us.ibm.com Space: dev

**Manage**

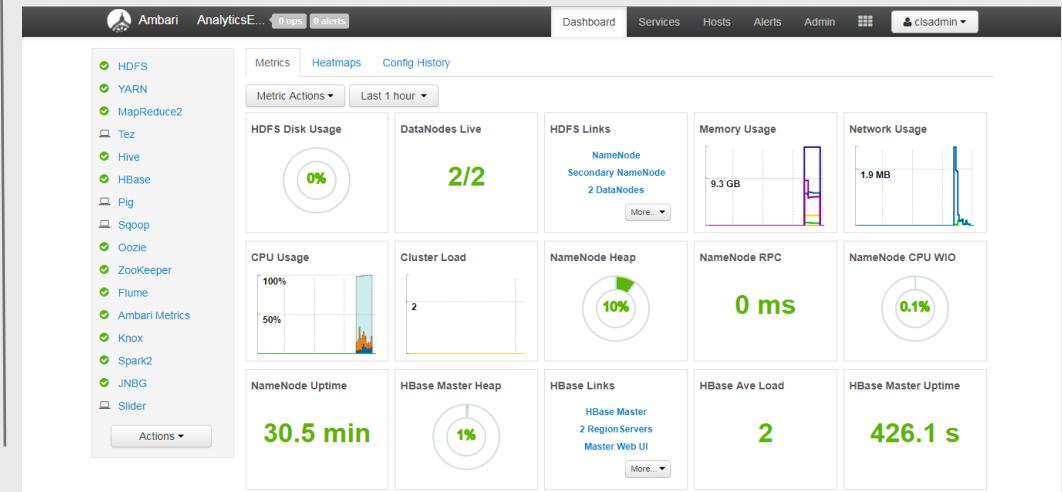
Service credentials

Cluster overview

User name: cladmin  
Password:   
Software package: AE 1.0 Hadoop and Spark

Nodes

NODE TYPE	NODE NAME	PUBLIC IP	COMMISSION TIME
master-management	chs-hpu-805-mm001.bi.services.us-south.bluemix.net	169.60.137.197	2018-03-07 10:55:07 PST
management-slave1	chs-hpu-805-mm002.bi.services.us-south.bluemix.net	169.60.137.197	2018-03-07 10:55:07 PST
management-slave2	chs-hpu-805-mm003.bi.services.us-south.bluemix.net	169.60.137.197	2018-03-07 10:55:07 PST
compute	chs-hpu-805-dn001.bi.services.us-south.bluemix.net	-	2018-03-07 10:55:07 PST
compute	chs-hpu-805-dn002.bi.services.us-south.bluemix.net	-	2018-03-07 10:55:07 PST



# Dynamic Dashboards

*Making insights available to all*

## Simplifying **Data Exploration** to initiate analysis and share results

### Visualize

Represent analytic results as compelling interactive graphics

- Immediately view effective visualizations fitting the data selected.
- Choose your favorite graph or chart type from palette of options
- Apply Filters to individual or multiple visualizations.
- Customize appearance with individual settings or dashboard themes.

### Share

Deliver dashboards across the enterprise, providing insights where business decisions are made.

- Collaborate on dashboards with other project users.
- Share interactive dashboards through a public URL for use by others outside the platform.

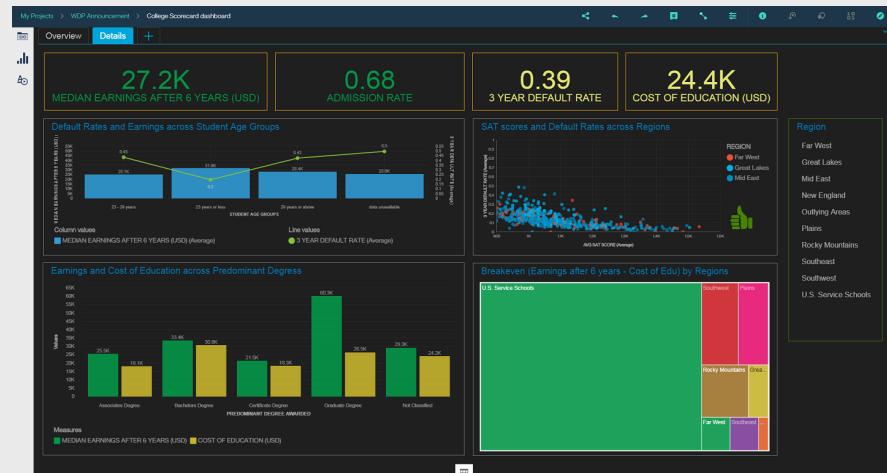
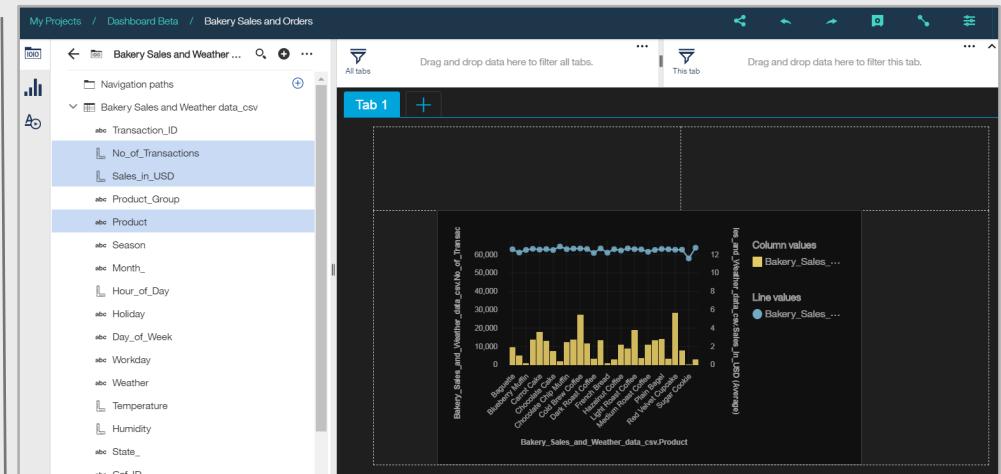
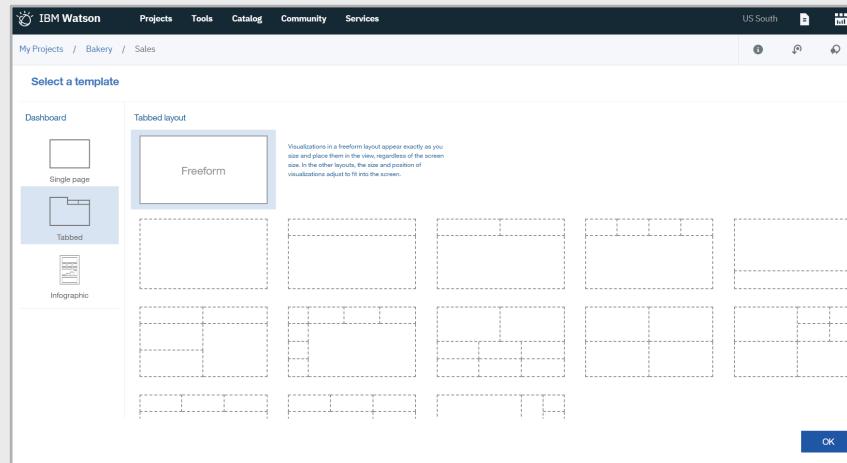
### Discover

Utilize enterprise data assets with confidence through projects and the Watson Knowledge Catalog.

- Access data assets associated with your project
- Data sources may be local uploaded files or connections to relational sources.
- Search for data through the data catalog, then explore using dashboards.

# Dynamic Dashboards

Making insights available to all



# IBM Watson®

Get started today [www.ibm.com/watson](http://www.ibm.com/watson)