

Cloud & AI Introduction

The App Revolution

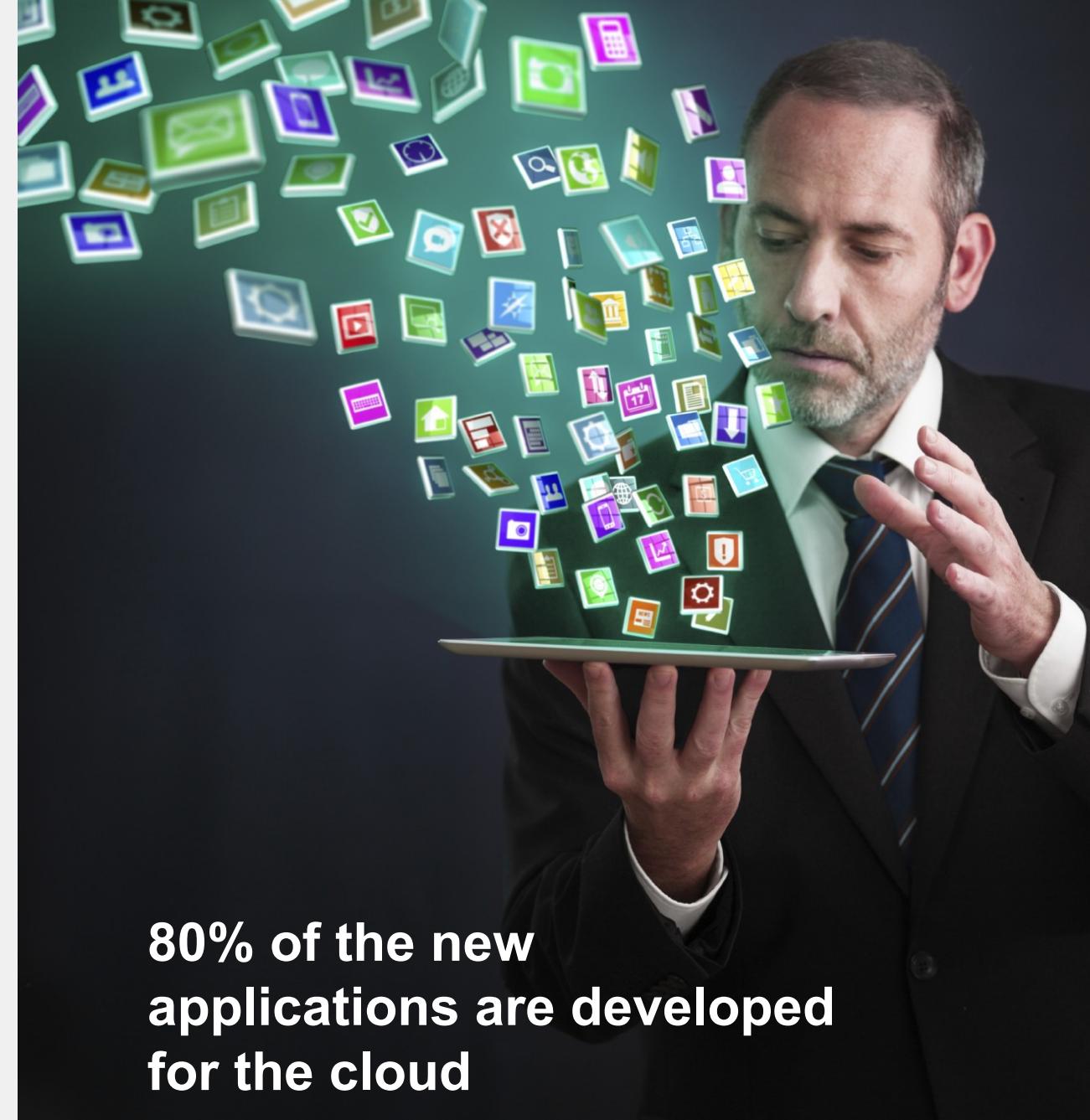
Apps are everywhere

Internet of Things

Big Data

Social Networks

Cognitive Computing



**80% of the new
applications are developed
for the cloud**

The App Revolution

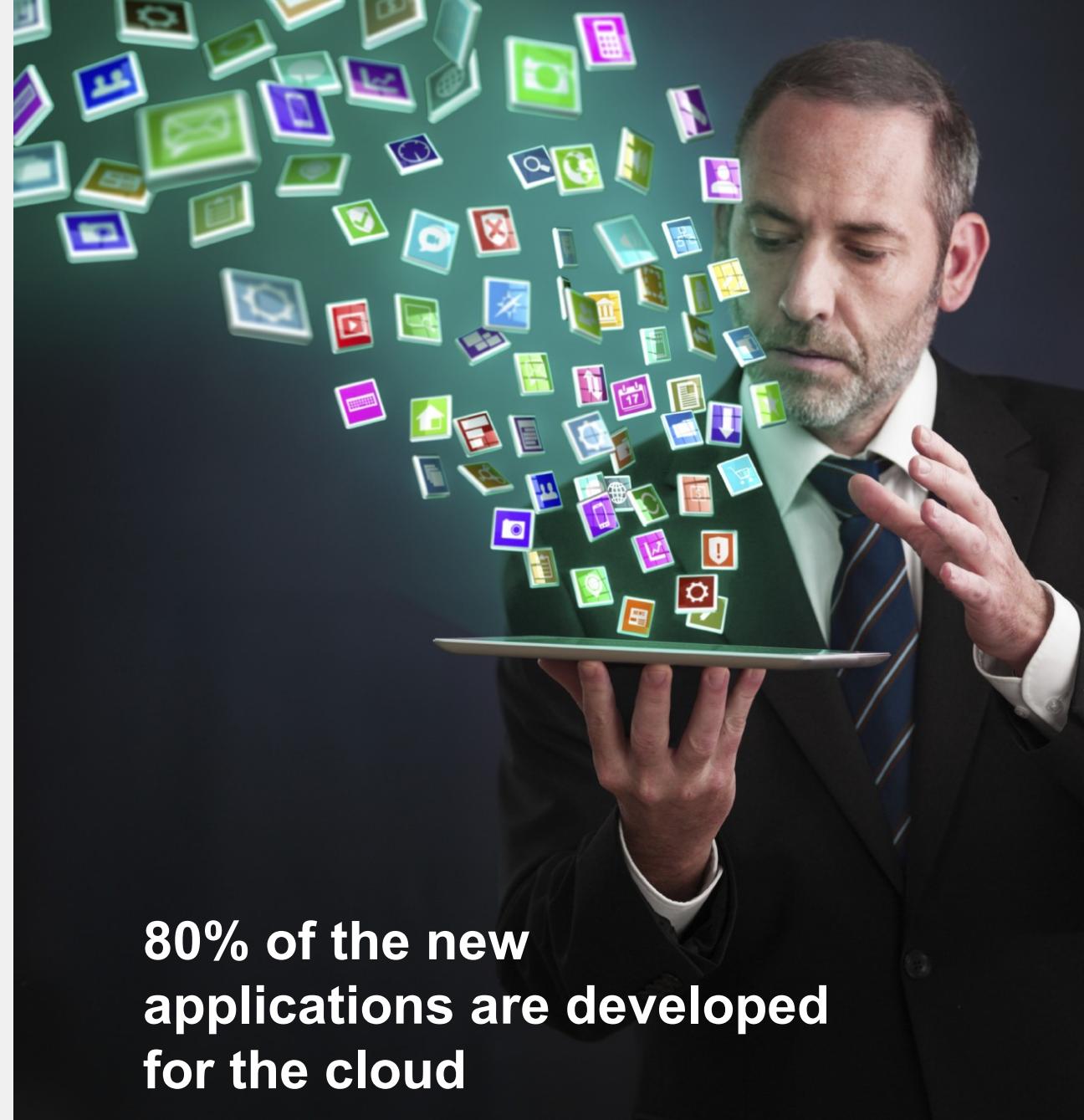
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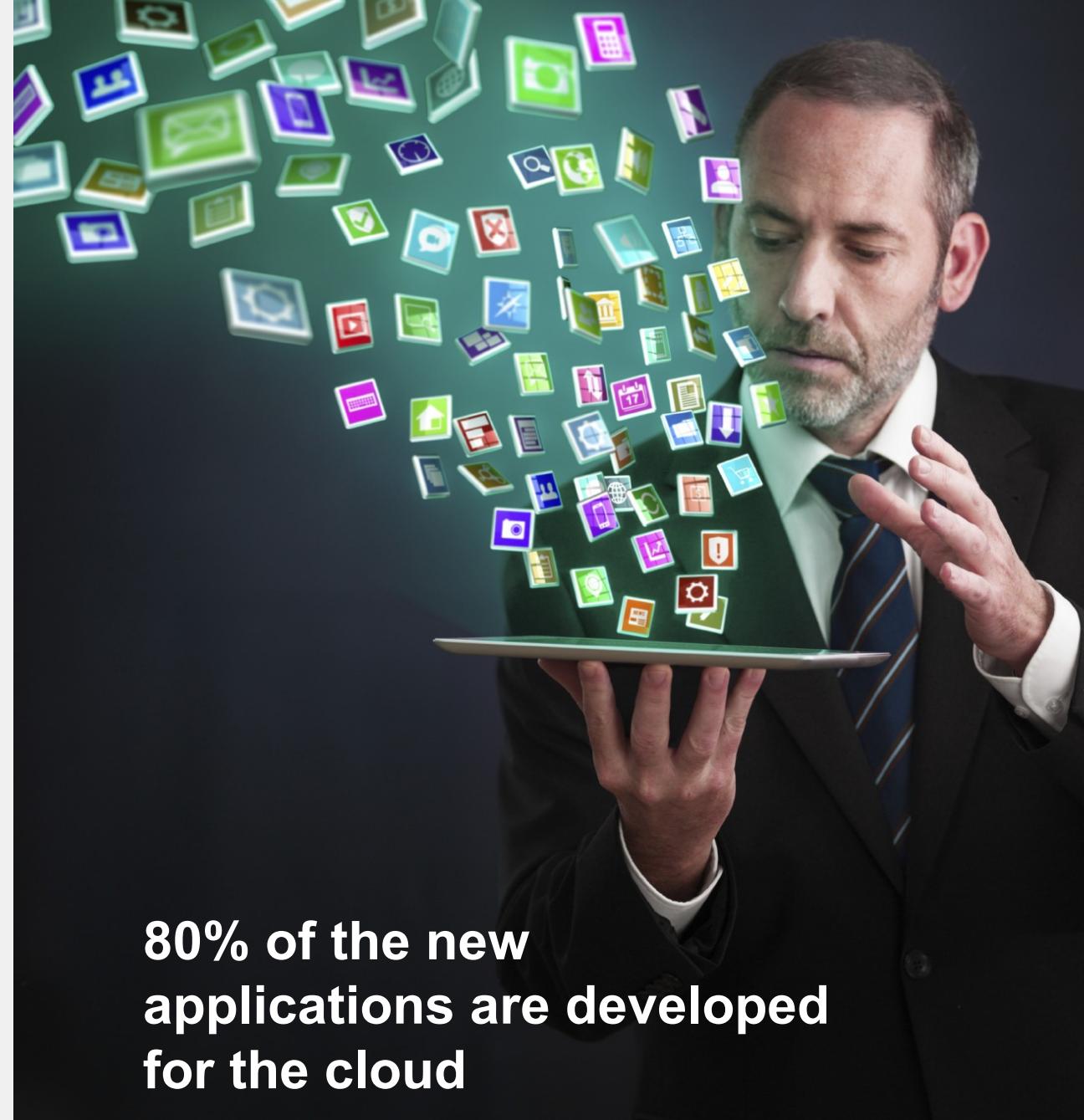
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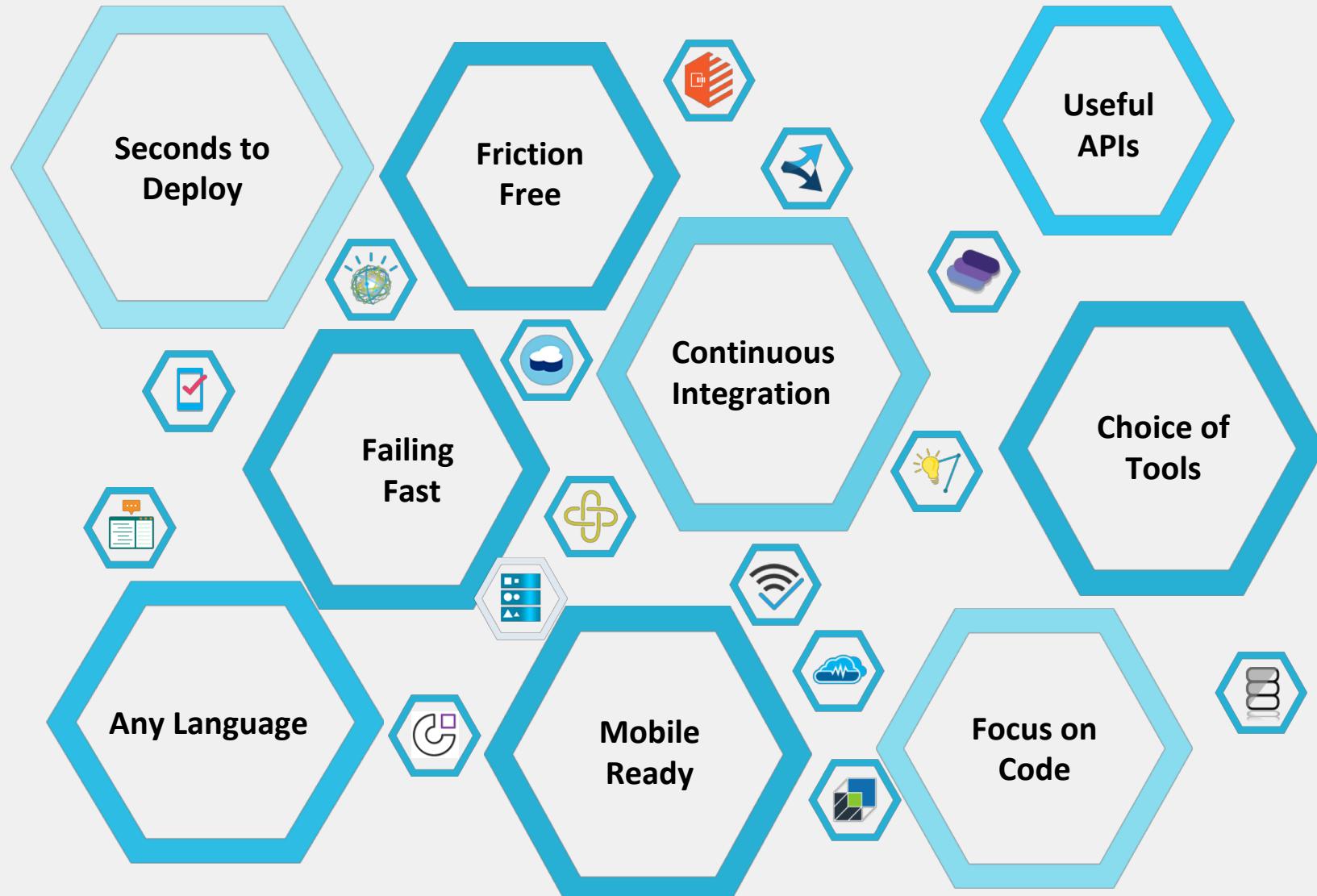
Social Networks

Cognitive Computing



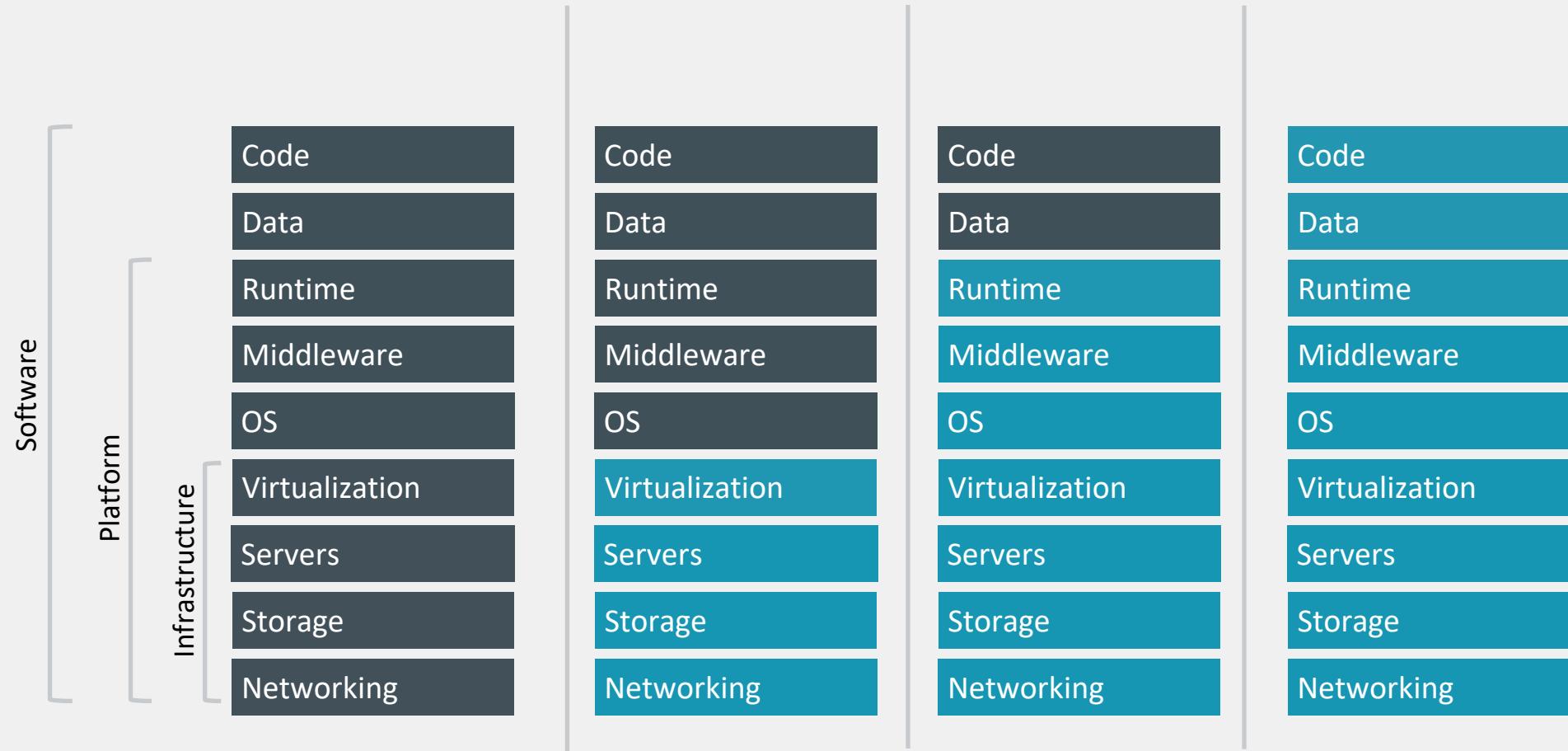
**80% of the new
applications are developed
for the cloud**

App Development is about speed and choice



Cloud Deployment Models

- Customer Managed
- Service Provider Managed



On-premise

IAAS

Infrastructure as a
Service

PAAS

Platform as a
Service

SAAS

Software as a
Service

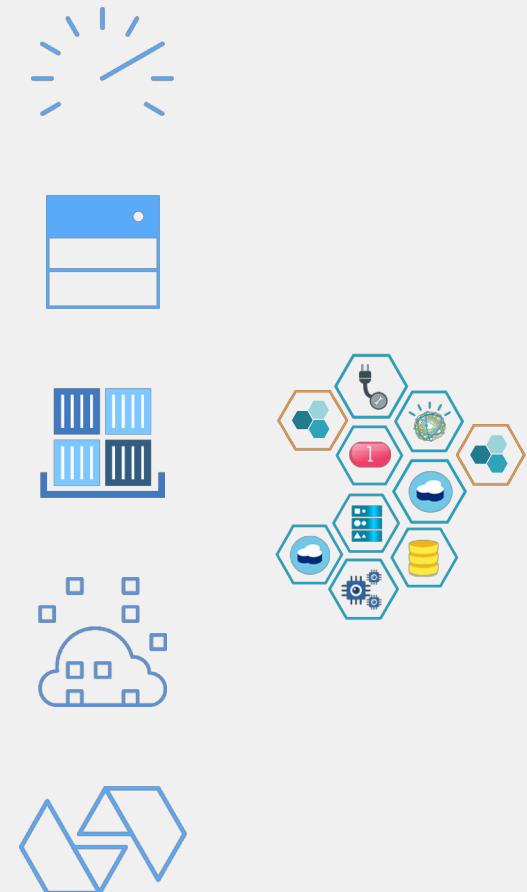
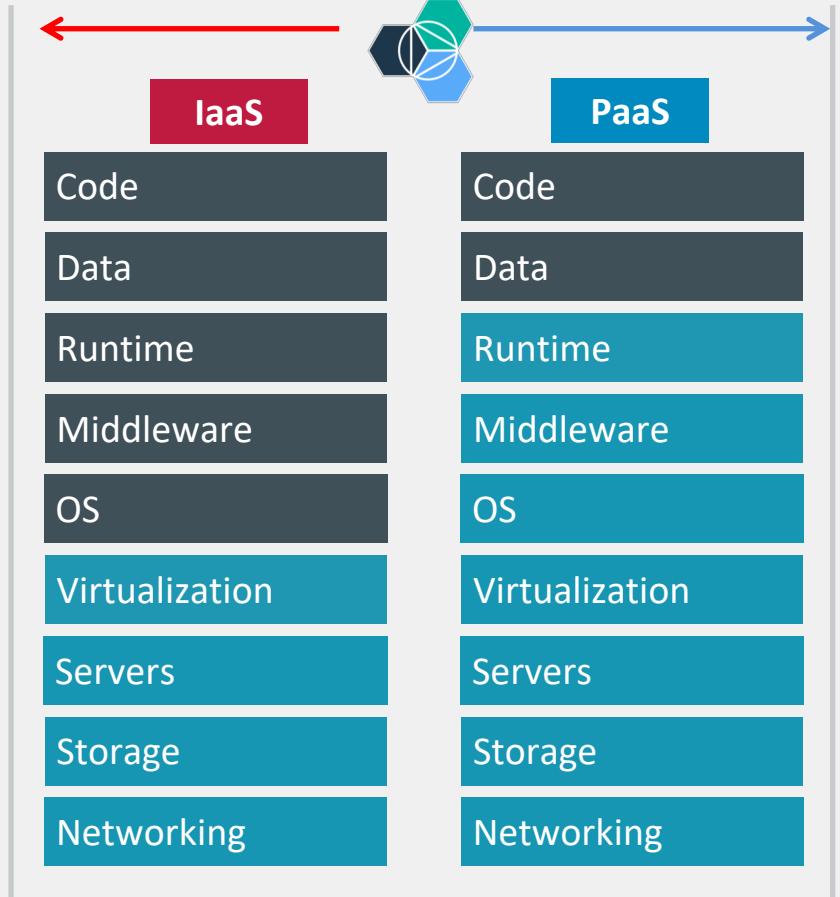
Cloud Platform

IBM Cloud Platform

IBM Cloud : flexibility of choice

- Customer Managed
- Service Provider Managed

Capabilities in IBM Cloud now span **PaaS** and **IaaS** and can be delivered as a **public**, **dedicated**, or **private** implementation.



IBM Cloud : the definition

IBM Cloud is an **open-standards**, cloud-based **platform** for **building, running, and managing applications**.

Build your apps, your way

Use the most prominent compute technologies to power your app:
Cloud Foundry, Docker, K8S, VMs.

Scale more than just instances

Development, monitoring, deployment, and logging tools allow the developer to run and manage the entire application.

Extend apps with services

A catalog of IBM, third party, and open source services allow the developer to stitch an application together quickly.

Deploy and manage hybrid apps seamlessly

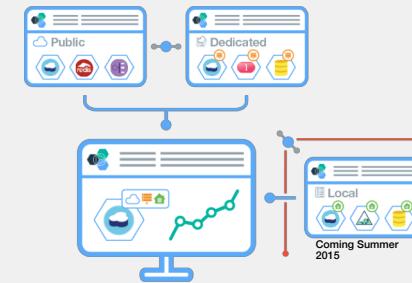
Get a seamless dev and management experience across a number of hybrid implementations options.

Layered Security

IBM secures the platform and infrastructure and provides you with the tools to secure your apps.

Flexible Pricing

Try compute options and services for free and, when you're ready, pay only for what you use. Pay as you go and subscription models offer choice and flexibility.



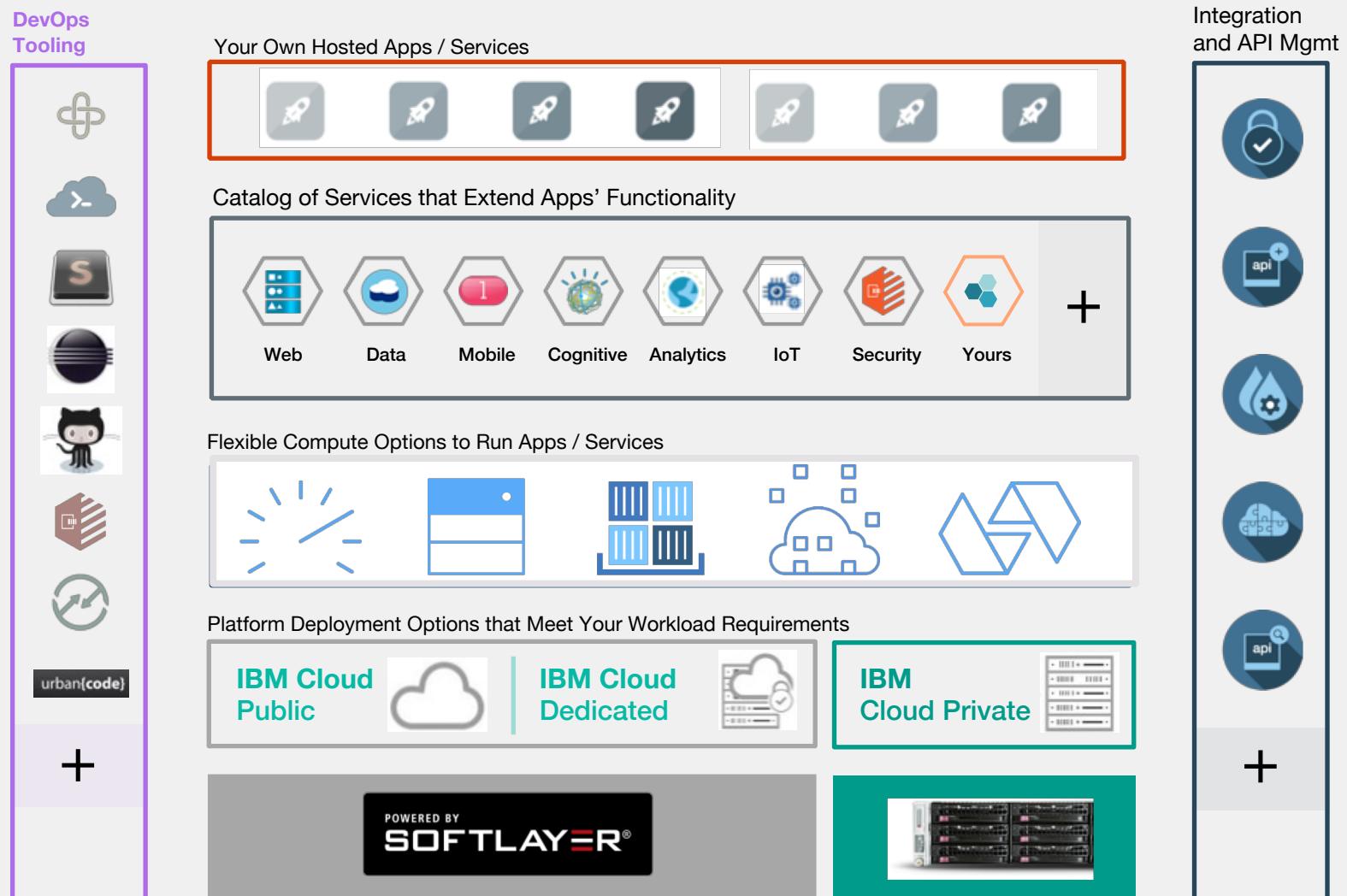
IBM Cloud : the definition

A full-stack cloud platform with over 170 products and services covering data, serverless, containers, AI , IoT and blockchain.

 Compute	 Network	 Storage	 Management
 Security	 Databases	 Analytics	 AI
 IoT	 Mobile	 Developer Tools	 Blockchain
 Integration	 Migration	 Private Cloud	 VMware

IBM Cloud Architecture & Design

IBM Cloud is underlined by three four open compute technologies: Bare Metal, VMs, **Cloud Foundry**, **Docker** and **OpenWhisk**. It extends each of these with a growing number of 150+ **services**, robust **DevOps tooling, integration** capabilities, and a seamless **developer experience**.



Demo

IBM Cloud Catalog Docs Support Manage Search for resource... 393750 - CPL@fr ibm c... 

Catalog

Search the catalog... Filter

All Categories >

Featured Offerings

IBM Cloud Private Hosted
IBM
Bring together the power of containerized IBM software, Kubernetes, and VMware to your VMware environment in the IBM Cloud.



Kubernetes Service
IBM
Deploy and scale secure, highly available apps in Kubernetes. IBM manages your master, and you control worker nodes.



Compute

Infrastructure

Kubernetes Service
IBM
Deploy and scale secure, highly available apps in Kubernetes. IBM manages your master, and you control worker nodes.

Bare Metal Server
IBM
Bare metal servers provide the raw horsepower you demand for your processor-intensive and disk I/O-intensive workloads. These servers come with the

Cloud Foundry Enterprise Environment
IBM
An isolated environment for hosting your Cloud Foundry apps with full admin control over configuration, capacity and access

Virtual Server
IBM

WebSphere Application Server
IBM

HPCaaS from Rescale
Third Party

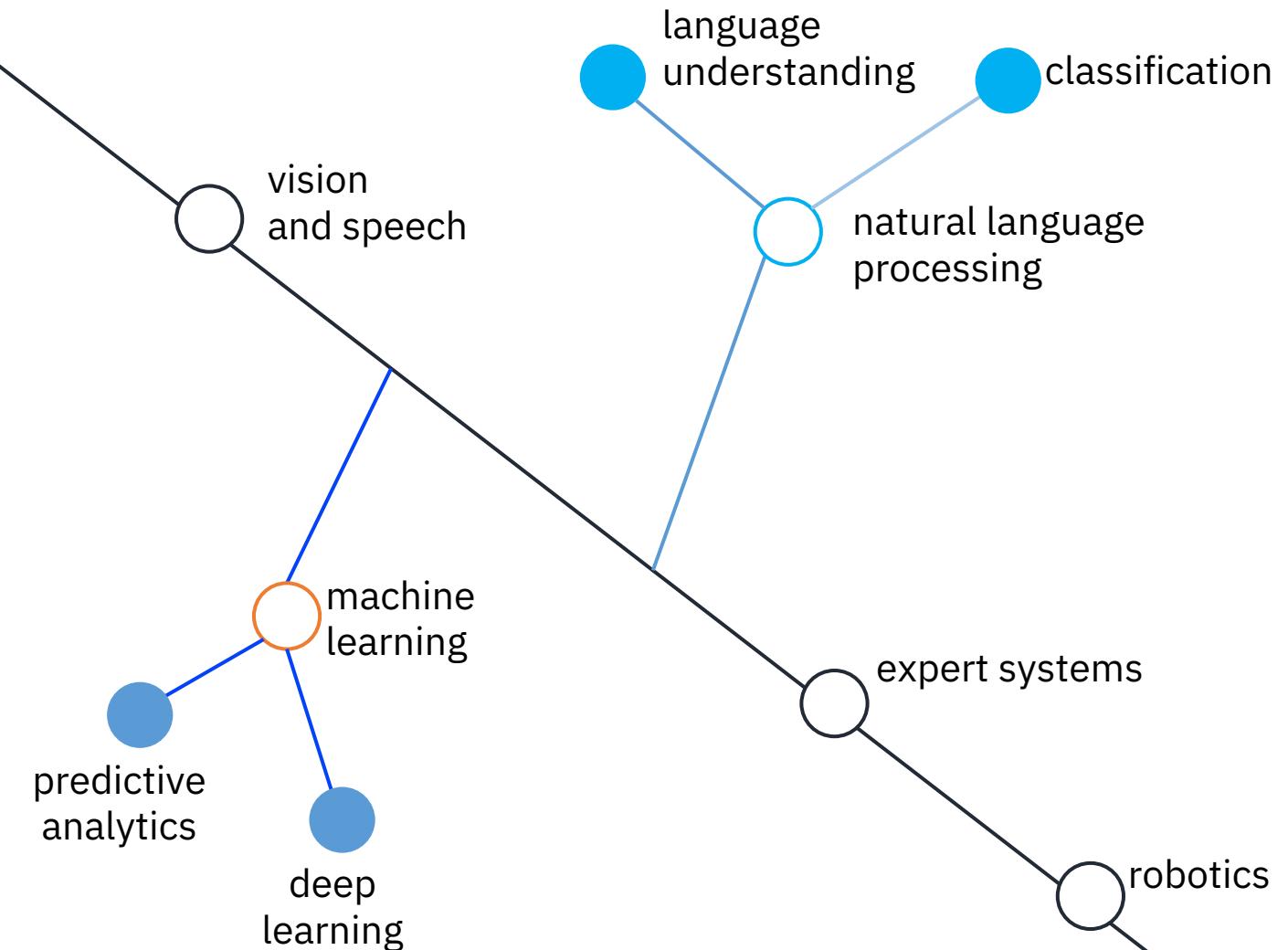
FEEDBACK

Watson AI Platform

Artificial Intelligence

AI is the theory and development of computer systems to perform tasks that normally require human intelligence.

AI systems continuously learn using such techniques as machine learning and deep learning to solve problems in machine vision, speech and natural language.



Every Business and Enterprise is Embracing AI

Leaders everywhere
are monetizing data
and developing
strategies to embed
AI in business



Sales

Market basket analysis,
next-best offer,
customer churn,
propensity to buy, and
smart engagement.



Marketing

Discount targeting, email
optimization, and lifetime
client value, basket
recommendation
systems.



Human Resources

Medicare fraud, AI-
assisted diagnosis, and
drug demand
forecasting.



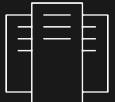
Supply Chain

Predictive maintenance,
process optimization,
and demand forecasting.



Energy & Utilities

Power usage prediction,
maintenance, and smart
grid management.



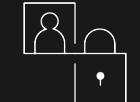
Finance

Customer segmentation,
credit risk, and credit
card fraud detection.



Security

Activity monitoring,
intrusion detection, and
log analysis.



Data & Technology

Dynamic pricing, call
center assistance,
tourism forecasting, and
self-driving cars.

Machine Learning is algorithm selection

Deep learning is neural network design

AI is systems architecture

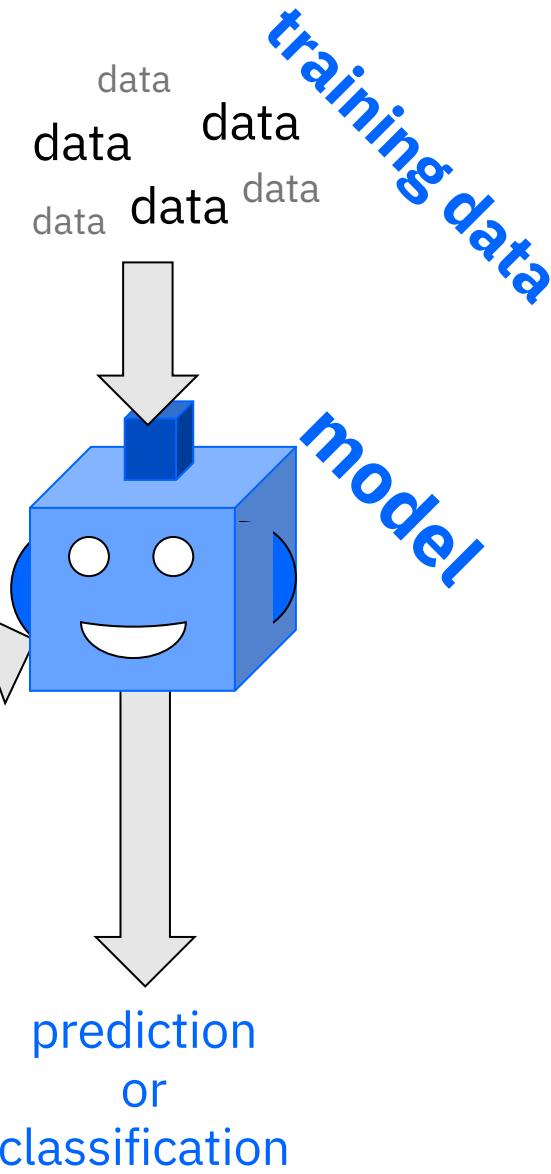
How does machine learning work?

Machine learning requires
TONS OF DATA

- ① A machine learning model is trained to recognize patterns in historical data

- ② The model is then shown new data and asked to predict or classify it.

- ③ If patterns in the new data match the training data then the model makes accurate predictions



AI Products & Services

AI Assistant

Integrate diverse conversation technology into your application.

Knowledge

Get insights through accelerated data optimization capabilities.

Vision

Identify and tag content then analyze and extract detailed information found in an image.

Speech

Convert text and speech with the ability to customize models.

Language

Analyze text and extract meta-data from unstructured content.

Empathy

Understand tone, personality, and emotional state.

Watson Assistant (formerly Conversation)

Lite • IBM

Watson Assistant a platform that allows developers and non-technical users to collaborate on building conversational AI-powered assistants.

AI OpenScale

Lite • IBM

IBM AI OpenScale is an enterprise-grade environment for AI infused applications that provides enterprises with visibility into how AI is being built, used, and

Compare Comply

IBM • Beta

Process governing documents to convert, identify, classify, and compare important elements

Discovery

Lite • IBM

Add a cognitive search and content analytics engine to applications.

Knowledge Catalog

Lite • IBM

Discover, catalog, and securely share enterprise data.

Knowledge Studio

Lite • IBM

Teach Watson the language of your domain.

Language Translator

Lite • IBM

Translate text, documents, and websites from one language to another. Create industry or region-specific translations via the service's customization capability.

Machine Learning

Lite • IBM

IBM Watson Machine Learning - make smarter decisions, solve tough problems, and improve user outcomes.

Natural Language Classifier

IBM

Natural Language Classifier uses advanced natural language processing and machine learning techniques to create custom classification models. Users train

Natural Language Understanding

Lite • IBM

Analyze text to extract meta-data from content such as concepts, entities, emotion, relations, sentiment and more.

Personality Insights

Lite • IBM

The Watson Personality Insights derives insights from transactional and social media data to identify psychological traits

Speech to Text

Lite • IBM

Low-latency, streaming transcription

Text to Speech

Lite • IBM

Synthesizes natural-sounding speech from text.

Tone Analyzer

Lite • IBM

Tone Analyzer uses linguistic analysis to detect three types of tones from communications: emotion, social, and language. This insight can then be used to drive

Visual Recognition

Lite • IBM

Find meaning in visual content! Analyze images for scenes, objects, faces, and other content. Choose a default model off the shelf, or create your own custom

Watson Studio

Lite • IBM

Embed AI and machine learning into your business. Create custom models using your own data.

PowerAI

Third Party

The accelerated deep learning platform for enterprise. Built on the IBM PowerAI platform, powered by Nimbix.

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

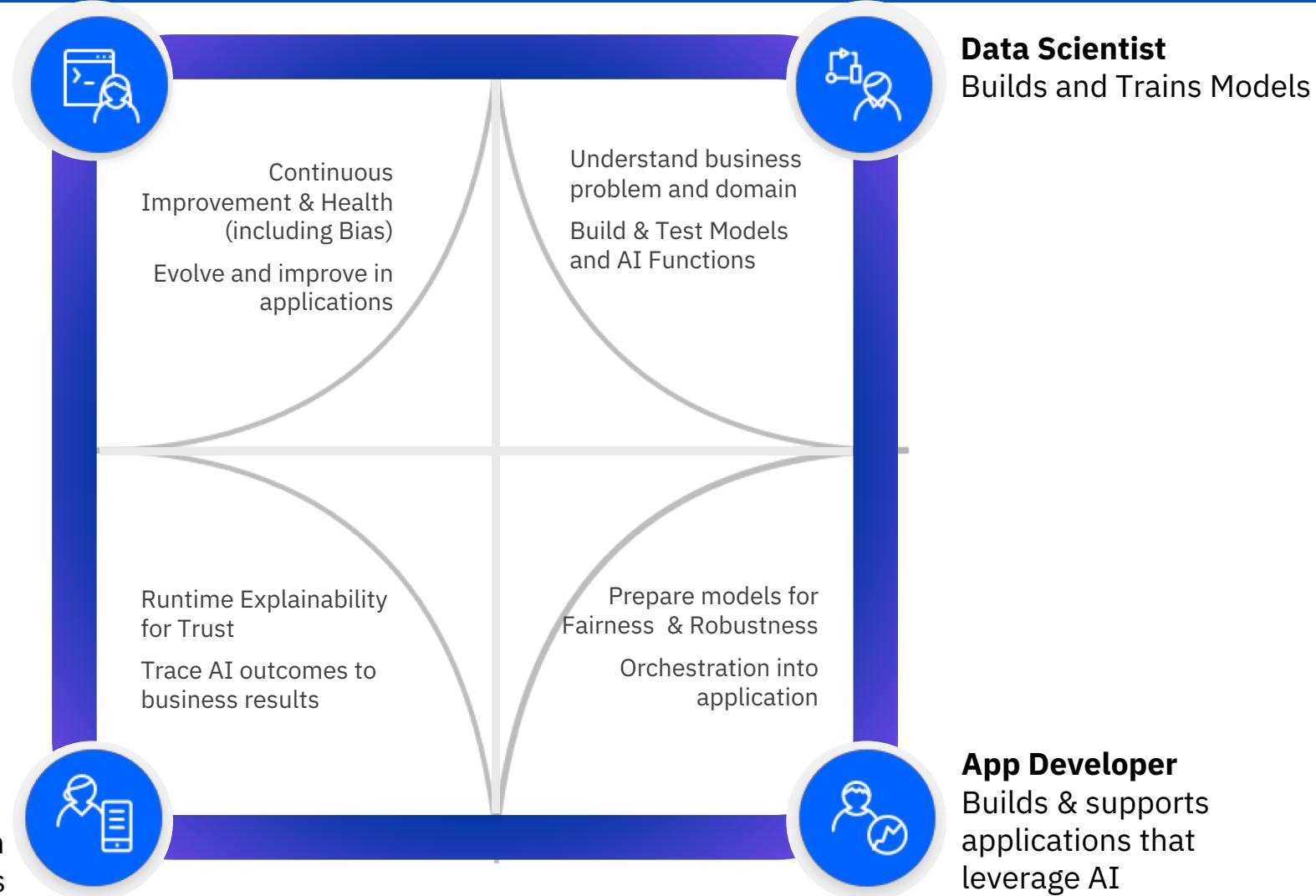
Tools & Infrastructure

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

Watson AI Platform

Built for AI teams – enabling team productivity and collaboration

Business Process Owner
Designs business processes, leads a team.



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

Supporting the end-to-end AI workflow

Connect & Access Data

Search and Find Relevant Data

Prepare Data for Analysis

Build and Train ML/DL Models

Deploy Models

Monitor, Analyze and Manage

Connect and discover content from multiple data sources in the cloud or on premises. Bring **structured** and **unstructured** data to one toolkit.

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.

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.

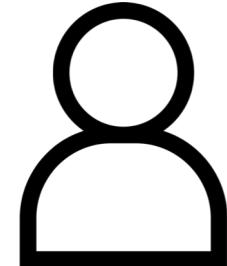
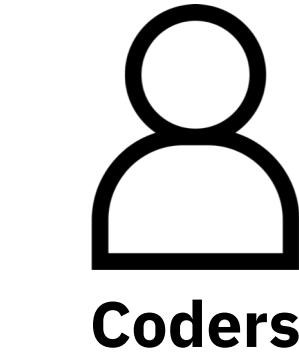
Democratize the creation of ML and DL models. Design your AI models **programmatically** or **visually** with the most popular **open source** and IBM ML/DL frameworks or leverage transfer learning on **pre-trained** models using **Watson tools** to adapt to your business domain. Train at scale on **GPUs**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

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

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

Two types of custom model builders



**Non-Coders
(Clickers)**



SPSS Modeler



Model Builder

Deep Learning



torch



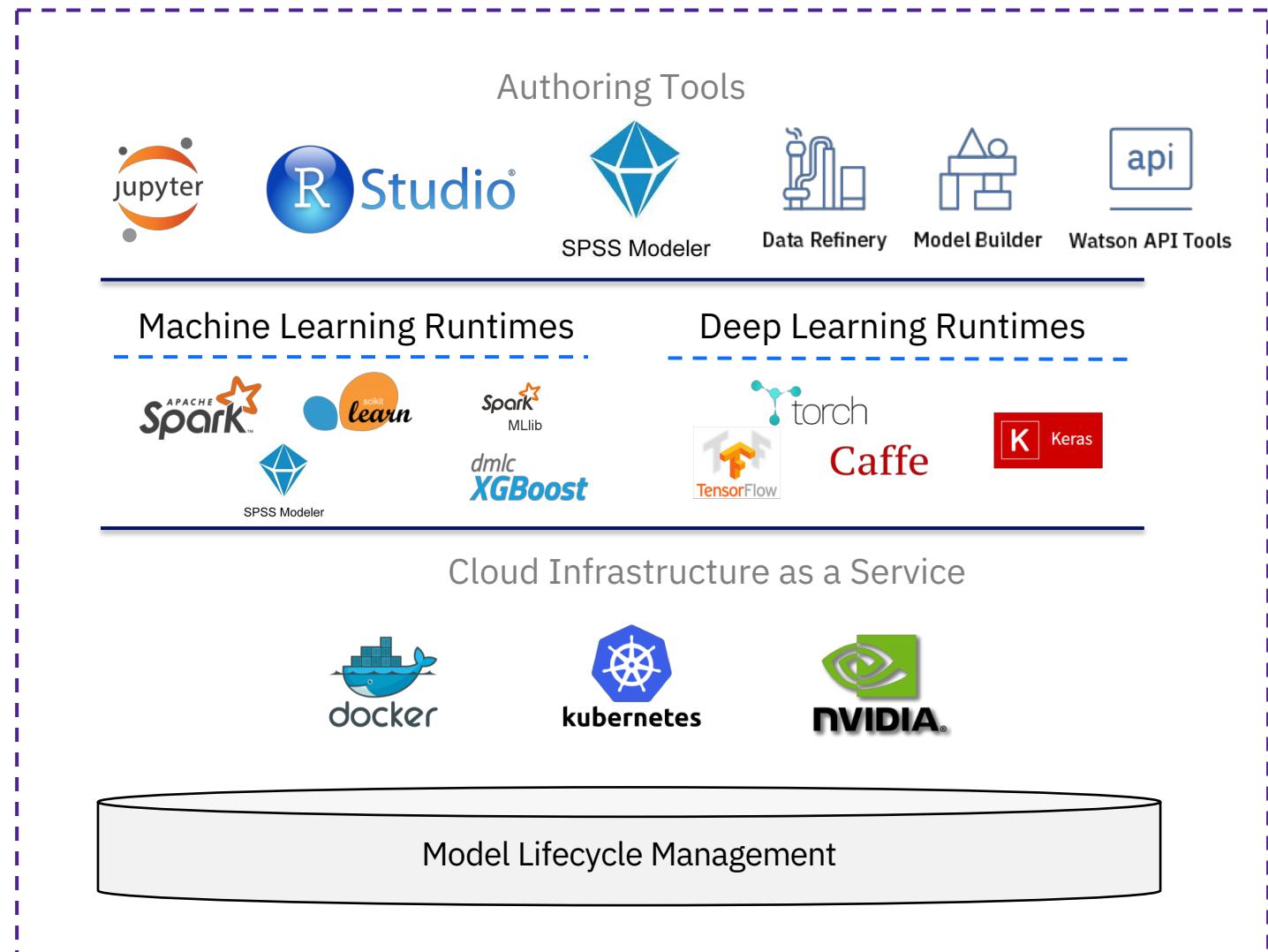
Caffe



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



Data Refinery

Making data fit for use

The screenshot shows the IBM Watson Data Preparation interface. At the top, there are navigation links for 'IBM Watson', 'Projects', 'Tools', 'Community', 'Services', and 'US South'. Below the header, the breadcrumb path is 'My Projects / Data Preparation / Customer_Orders_flow / Data Refinery'. On the right side, there are various icons for file operations like 'New', 'Open', 'Save', etc. The main area is titled '+ Operation' with the sub-instruction 'Code an operation to cleanse and shape your data'. A table titled 'OPERATIONS' lists various data manipulation functions: 'arrange', 'count', 'distinct', 'filter', 'group_by', 'mutate', 'mutate_all', 'mutate_at', and 'select'. Each function has a corresponding code snippet and a preview of the transformed data. To the right of the table, a sidebar titled '4 STEPS' details the steps taken: 'Data Source : Great Outd...', 'Remove duplicates' (with a note 'Removed rows with duplicate values in STATE'), 'Sort ascending' (with a note 'Sorted rows by CITY'), and 'Sort descending' (with a note 'Sorted rows by CUST_ORDER_NUMBER'). A large blue box at the bottom contains the text 'Self-service data refinement and cleaning'.

	TRANSACTION	String	arrange	PRODUCT_TYPE	String	CUST_ORDER_NUMB	String	COUNTRY	String	STATE	String	CITY	String	GEN	Strin
1	TR9304		count	nt	Sleeping Bags	179562		United States	SD	Aberdeen		Female			
2	TR1537		distinct	u...	Tools	170697		Australia	SA	Adelaide		Female			
3	TR1790		filter	es	Eyewear	177116		India	GJ	Ahmedabad		Female			
4	TR3101		group_by	nt	Tents	173945		United States	NY	Albany		Male			
5	TR2045		mutate	nt	Tents	174874		United States	CA	Alhambra		Female			
6	TR3241		mutate_all	nt	Cooking Gear	173181		United States	WI	Almena		Male			
7	TR1764		mutate_at	nt	Packs	171843		India	MP	Amravati		Male			
8	TR3963		mountaineering Equ...	Climbing Accessories	174445			United States	AK	Anchorage		Female			
9	TR2608		Camping Equipment	Tents	175833			United States	CO	Aurora		Male			
10	TR1959		Personal Accessories	Watches	174729			United States	AZ	Bagdad		Female			
11	TR4372		Personal Accessories	Eyewear	176195			India	HR	Bahadurgarh		Female			
12	TR1640		Personal Accessories	Eyewear	170869			Canada	QC	Baie-Comeau		Female			
13	TR1559		Personal Accessories	Binoculars	170732			Brazil	BR-SC	Balneario Cambor...		Female			
14	TR4627		Mountaineering Equ...	Tools	177371			Spain	B	Barcelona		Male			
15															
16															
17															

Self-service data refinement and cleaning

IBM Watson Projects Tools Community Services US South 10 11

My Projects / Data Preparation / Customer_Orders_flow / Data Refinery

+ Operation Code an operation to cleanse and shape your data

Data Profile Visualizations Steps

CUST_ORDER_NUMBER	COUNTRY	STATE	CITY
String	String	String	String
FREQUENCY	FREQUENCY	FREQUENCY	FREQUENCY
171930	United States	WA	Singapore
172495	China	CA	Chengdu
176806	Germany	IA	Brisbane
109131	Spain	Singapore	Adelaide
101146	Great	BR-RJ	Beijing
101937	United Kingdom	NY	Sydney
102304	France	FL	Melbourne
104813	Canada	ON	Dublin
107726	Australia	BR-SP	Pearl
170420	Italy	SA	Guangzhou

STATISTICS Maximum length 6 Maximum length 14 Maximum length 9 Maximum length 25

STATISTICS Maximum length 1 Maximum length 2.3778 Mean length 8.1706

STATISTICS Maximum length 100 Unique 768

Comprehensive profiling

IBM Watson Projects Tools Community Services US South 11 10 11

My Projects / Data Preparation / Customer_Orders_flow / Data Refinery

+ Operation Code an operation to cleanse and shape your data

Data Profile Visualizations Steps

Input

Columns COUNTRY, PRODUCT_LINE

Chart types Tree

Brunel syntax

```
tree x{PRODUCT_LINE} size(#count) label(COUNTRY)  
tooltip(#all)
```

A large blue circle at the bottom left represents the total data. Three curved lines extend from it to three main categories: Camping Equipment, Golf Equipment, and Mountaineering Equipment. Each of these categories has a central blue dot and several smaller blue dots branching off to represent different countries. A large blue box at the bottom contains the text "Interactive visualization".

Interactive visualization

The screenshot shows the IBM Watson Data Prep interface. At the top, there's a navigation bar with links for Home, Projects, Tools, Community, Services, and a user icon. Below the navigation is a breadcrumb trail: My Projects / Data Preparation / Customer Orders_flow. To the right of the breadcrumb are buttons for Refine, a play arrow, and various settings. The main area is titled "Summary". It shows a data flow from "Great Outdoor Customer Orders.csv" to "Customer Orders_shaped.csv" through 3 steps. Below this, there's a section titled "Runs" with tabs for History and Schedule. The History tab displays a table of runs from March 6, 2018, to March 11, 2018, at 9:58 pm, with an interval of one day. A large blue callout box at the bottom left contains the text "Scheduling and monitoring".

DATE	DAY	TIME	Summary
6 Mar 2018	Tue	9:58 pm	
7 Mar 2018	Wed	9:58 pm	
8 Mar 2018	Thu	9:58 pm	
9 Mar 2018	Fri	9:58 pm	
10 Mar 2018	Sat	9:58 pm	
11 Mar 2018	Sun	9:58 pm	

Watson Studio

IBM Watson Projects Tools Catalog Community Services US South

My Projects / demo99 / Draw insights from Twitter da

File Edit View Insert Cell Kernel Help Not Trusted | Python 3.5

Format

Code

```
colors = ['gray'] + colors
lt.figure(figsize=(10,8))
lt.barh(y_pos, num_tweets, align='center', color=colors)
lt.yticks(y_pos, countries)
lt.xlabel('Number of Tweets')
lt.title('Tweets Country Distribution based on the User Profile')
lt.ylim(-1, len(y_pos))
lt.show()
```

Add a comment

Today

ARMAND RUIZ G... 7:49 AM

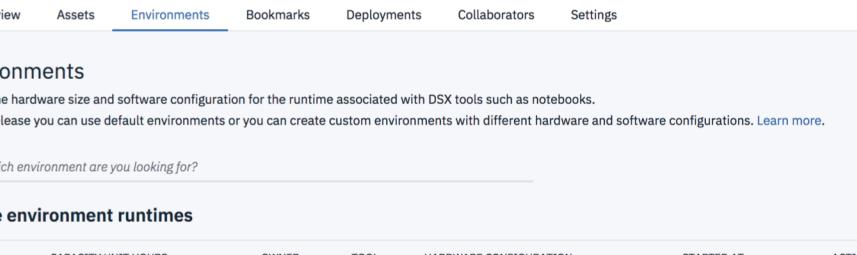
Great work!

Tweets Country Distribution based on the User Profile

Country	Number of Tweets
GERMANY	10
MEXICO	8
CANADA	6
INDIA	4
JAPAN	3
SPAIN	2

Open Source tools – Jupyter and RStudio

Open Source tools – Jupyter and RStudio



The screenshot shows the IBM Watson Data Science Experience (DSX) environment management interface. At the top, there's a navigation bar with links for Projects, Tools, Catalog, Community, Services, and a location dropdown set to US South. On the far right are icons for notifications, user profile, and system status.

The main header shows "My Projects / Think99" and includes a "+ Add to project" button and several small icons for project details.

A secondary navigation bar below the main header has tabs for Overview, Assets, Environments (which is selected and highlighted in blue), Bookmarks, Deployments, Collaborators, and Settings.

Environments

Define the hardware size and software configuration for the runtime associated with DSX tools such as notebooks.

In this release you can use default environments or you can create custom environments with different hardware and software configurations. [Learn more.](#)

Which environment are you looking for?

Active environment runtimes

Name	Capacity Unit Hours	Owner	Tool	Hardware Configuration	Started At	Actions
you currently have no active environment runtimes						

Environment definitions

+ New environment definition

Name	Tool	Hardware Configuration	Last Modified	Actions
Default SPSS Modeler XS	Wml_flow	2 vCPU and 8 GB RAM	2 Mar 2018	⋮
Defa	Elastic and customizable compute environments			
Defa				

Elastic and customizable compute environments

IBM Watson Projects Tools Catalog Community Services US South

Projects / Insurance use case / Default Custom Model

Car recognition

Unclassified images: 0 Incomplete classes: 0

Train Model (i)

My Classes All Images

Add a zipped file from your project.

Search classes

49 classes

Create a class

AMGeneralHummerS... 89 images

AcuraTSX Sedan 2012 81 images

AcuraIntegra Type R... 89 images

Acura TL Sedan 2012 86 images

Aston Martin V8 Vanta... 82 images

Audi 100 Sedan 1994 81 images

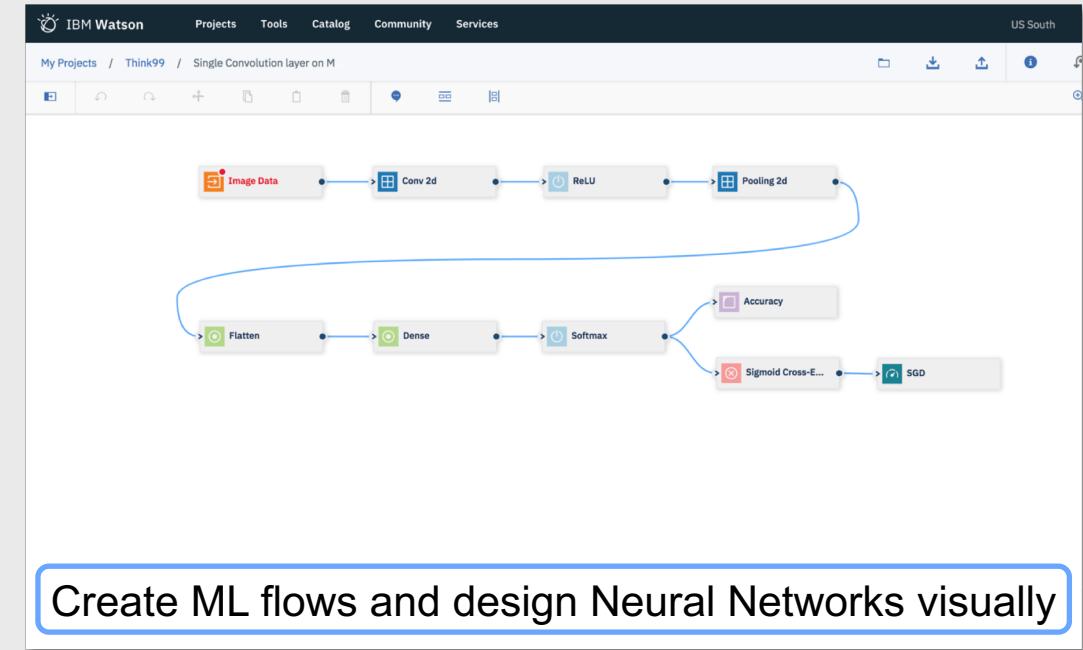
Aston Martin V8 Vanta... 90 images

Drop a .zip file of images here to add them to your project or browse to select a .zip file.

Watson Visual Recognition – retrain Watson

The screenshot shows the Watson Visual Recognition interface. At the top, there's a navigation bar with links for IBM Watson, Projects, Tools, Catalog, Community, and Services, along with a location indicator for US South. Below the navigation is a breadcrumb trail: Projects / Insurance use case / Default Custom Model. The main title is "Car recognition". On the right, there are status indicators for "Unclassified images: 0" and "Incomplete classes: 0", followed by a "Train Model" button and an information icon. The left sidebar has tabs for "My Classes" (which is selected) and "All Images". A placeholder text "Add a zipped file from your project." is present. The main area displays a grid of car images with their respective class names and image counts. Each card has a green circular progress indicator. To the right of the cards is a list of uploaded files, each with a timestamp and a download link. A large blue callout box at the bottom contains the text "Watson Visual Recognition – retrain Watson".

Watson Visual Recognition – retrain Watson



Create ML flows and design Neural Networks visually

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

Collapse

Data Asset US Airlines Owner: Jay Limburn Added: 1 Mar 2018 13:04 Airline	Data Asset Harry Rosen example Owner: Michael Tucker Added: 28 Feb 2018 17:30 Sales Forecast	Notebook Machine Learning using R Owner: Jay Limburn Added: 20 Feb 2018 14:55 notebooks... dsx	Data Asset FDIC Failed Bank List Owner: Jay Limburn Added: 19 Feb 2018 14:25 banking	Data Asset 2017 Small Business Banking Loans Owner: Jay Limburn Added: 19 Feb 2018 13:36 banking loan	Data Asset All US Banks Owner: Jay Limburn Added: 19 Feb 2018 13:36 fss banking
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Filter

Asset types

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

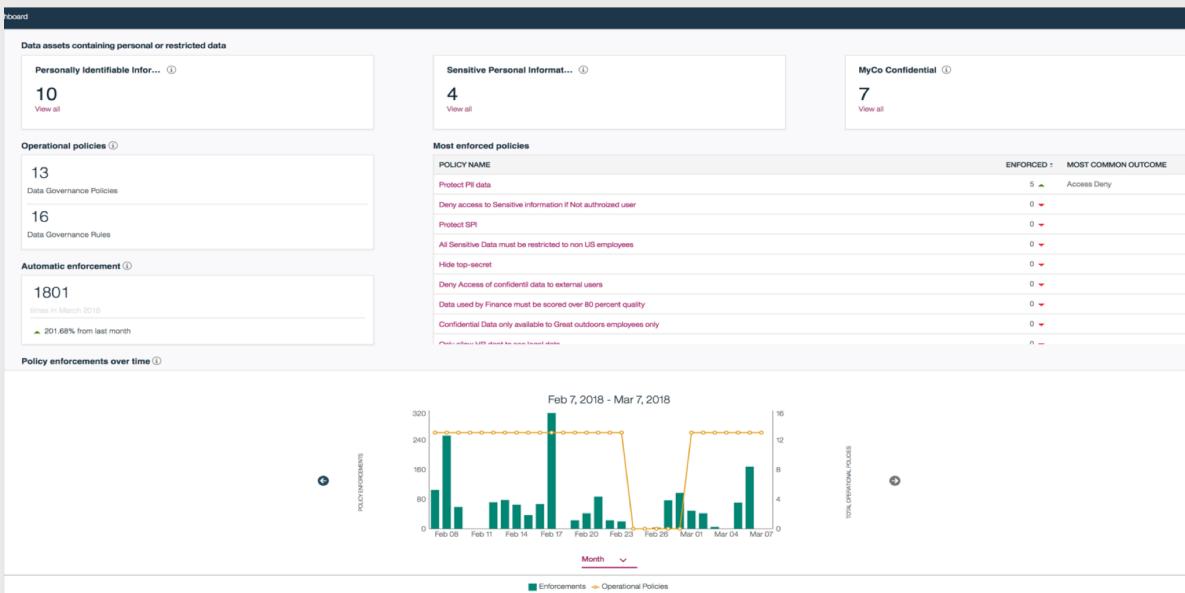
Tags

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

Available Assets

Showing 64 of 64 assets

<input type="checkbox"/> NAME :	OWNER	TAGS	TYPE	DATE ADDED	⋮
2017 Small Business Banking Loans	Jay Limburn	banking loan	Data Asset	19 Feb 2018	⋮
ANCESTRY	Jay Limburn	discovered : SAMPLES	Data Asset	13 Dec 2017	⋮
AWS Data Warehouse	Jay Limburn		Connection	13 Dec 2017	⋮
All US Banking Branches	Jay Limburn	fss banking branches	Data Asset	19 Feb 2018	⋮
Banking Demographic Data	Jay Limburn	banking client customer	Data Asset	19 Feb 2018	⋮
BlodPower_T.csv	paul taylor		Data Asset	22 Jan 2018	⋮
CONVERSION_RATE	Jay Limburn	discovered : GOSALES	Data Asset	13 Dec 2017	⋮
COUNTRY	Jay Limburn	discovered : GOSALES	Data Asset	13 Dec 2017	⋮
CUST_WIN_BACK	Jay Limburn	discovered : SAMPLES	Data Asset	13 Dec 2017	⋮
Customer Orders Q3	Jay Limburn	sales Warehouse	Data Asset	11 Jan 2018	⋮



Browse Assets Change Statistics Access control Settings

Total assets ①

2
Connections
56
Data Assets
4
Notebooks
64
Other
Total

Deleted assets ①

Showing MAR 2017 - MAR 2018 >
NUMBER OF ASSETS
MONTHS ▼
Deleted assets

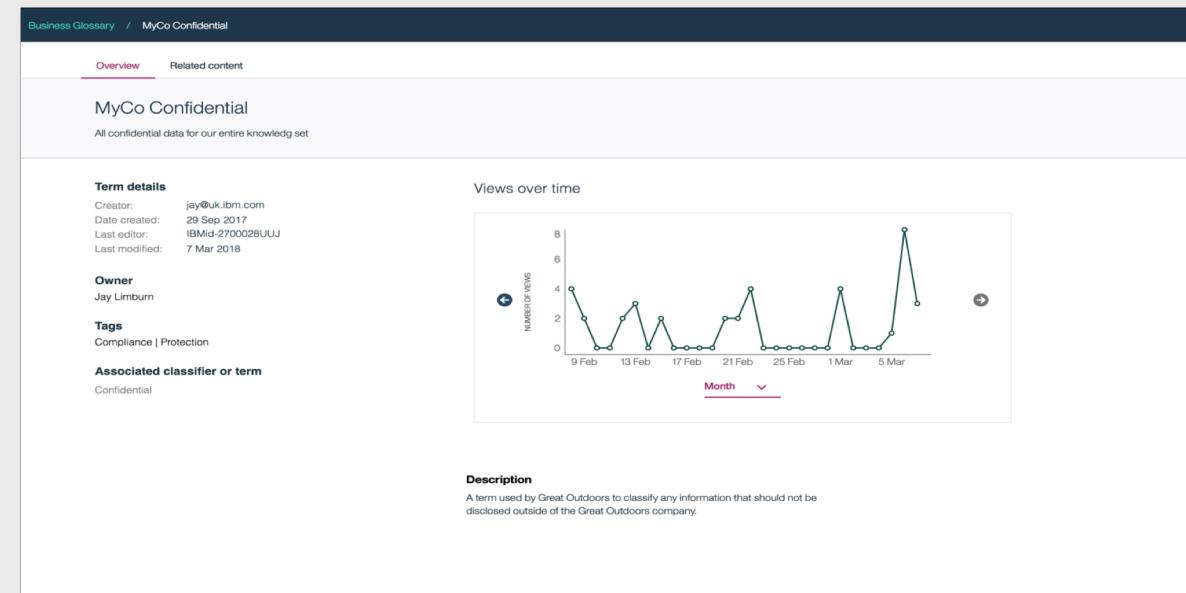
Added assets ①

Showing MAR 2017 - MAR 2018 >
NUMBER OF ASSETS
MONTHS ▼
Added assets

Assets accessed ①

March 2018

NUMBER OF ASSETS
1 2 3 4 5 6
Assets accessed Total assets



Thank You