

微软人工智能技术分享

闫伟
开发技术顾问



微软云 Azure 提供100多种服务

Security & Management

- Security Center
- Portal
- Azure Active Directory
- Azure AD B2C
- Multi-Factor Authentication
- Automation
- Scheduler
- Key Vault
- Store/ Marketplace
- VM Image Gallery & VM Depot

Media & CDN

- Media Services
- Media Analytics
- Content Delivery Network

Integration

- API Management
- BizTalk Services
- Logic Apps
- Service Bus

Compute Services

- Container Service
- VM Scale Sets
- Batch
- RemoteApp
- Dev/Test Lab

Platform Services

Application Platform

- Web Apps
- Mobile Apps
- API Apps
- Cloud Services
- Service Fabric
- Notification Hubs
- Functions

Data

- SQL Database
- SQL Data Warehouse
- DocumentDB
- SQL Server Stretch Database
- Redis Cache
- Storage Tables
- Azure Search

Intelligence

- Cognitive Services
- Bot Framework
- Cortana

Analytics & IoT

- HDInsight
- Machine Learning
- Stream Analytics
- Data Catalog
- Data Lake Analytics Service
- Data Lake Store
- IoT Hub
- Event Hubs
- Data Factory
- Power BI Embedded

Hybrid Cloud

- Azure AD Health Monitoring
- AD Privileged Identity Management
- Domain Services
- Backup
- Operational Analytics
- Import/Export
- Azure Site Recovery
- StorSimple

Compute

- Virtual Machines
- Containers

Storage

- Blob
- Queues
- Files
- Disk

Networking

- Virtual Network
- Load Balancer
- DNS
- Express Route
- Traffic Manager

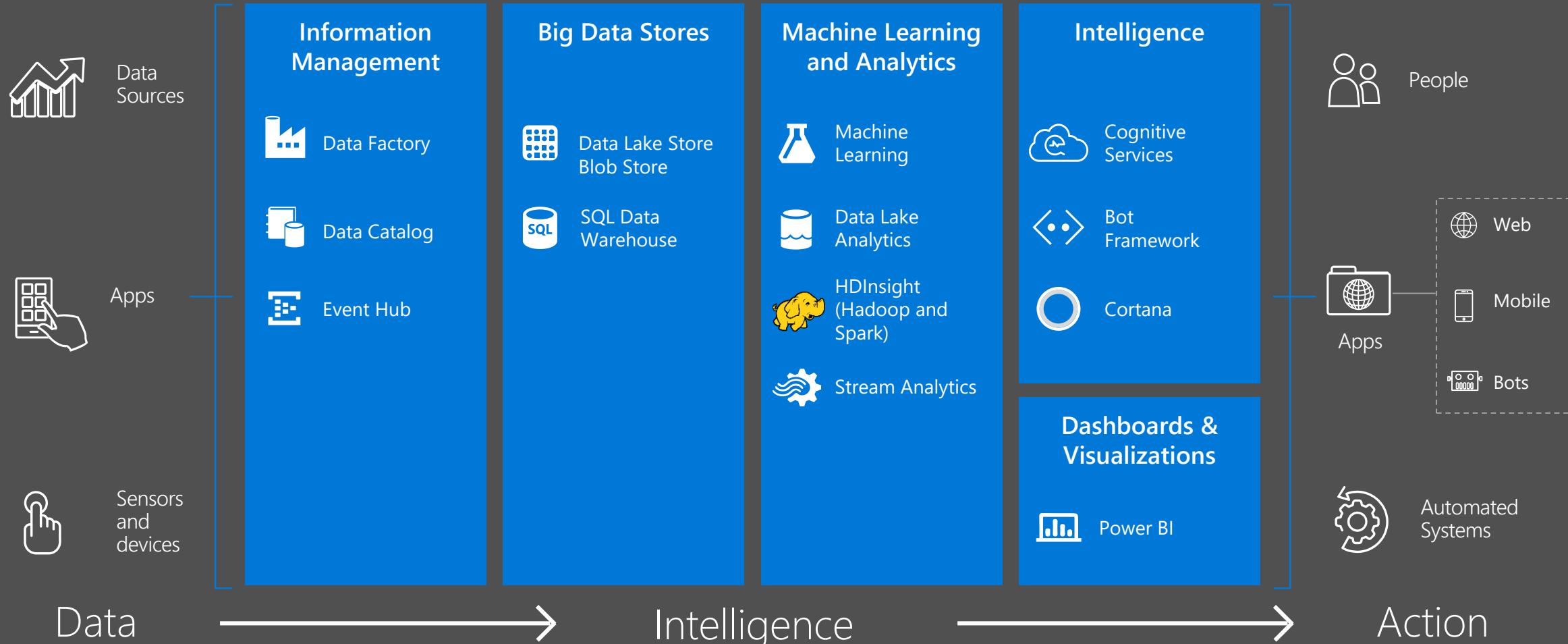
- VPN Gateway
- App Gateway

Datacenter Infrastructure (38 Regions, 24 Online)



Cortana Intelligence Suite

Intelligent Apps require Intelligent Solutions



微软云 Azure 助力人工智能



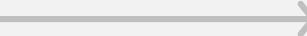
Cognitive Services



Developer



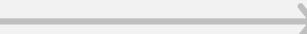
Azure Machine Learning Studio



Data Scientist / IT



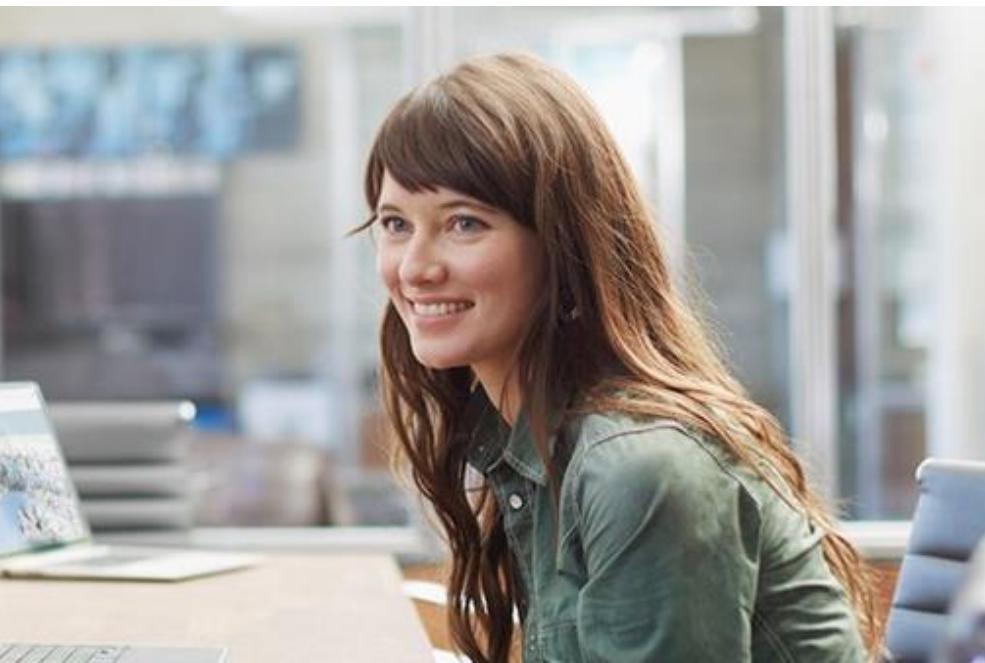
Microsoft Cognitive Toolkits (CNTK)



Researcher

微软 认知服务

利用世界领先的人工智能技术，
让您的应用更具人性化



视觉

从面部感官到感觉，让您的对话机器人了解图像、视频和情绪



语音

把语音转换为文本或把文本转换为语音；
了解您的意图，翻译语言，过滤噪音以及识别说话者



语言

教您的对话机器人理解自然语言指令，解析复杂的文本以及了解用户情绪



知识

从网络、学术界或您自己的数据积累中融合丰富的知识



搜索

通过必应API的强大功能访问数十亿网页、图片、视频和新闻

认知服务



视觉



语音



语言



知识



搜索

计算机视觉

语音识别

必应拼写检查

学术搜索

必应自动推荐

情绪识别

自定义语音识别

语言理解

实体链接

必应图片搜索

人脸识别

声纹识别

语言分析

知识搜索

必应新闻搜索

视频检测

文本分析

推荐

必应视频搜索

内容合规性检测

网络级语言模型

QnA Maker

必应网络搜索

翻译API

微软认知服务

视觉



计算机视觉



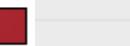
目录 人; 1 张脸

成年人 / 活泼的? 错误 / 正确

主色



重色



语音



语音转换为文字 & 文字转换为语音



将文本转换为语音

将语音转换为文本

提取用户的意图

语言



自然语言处理

意图: 展现事件
内容: 日常事件
日期: 今日

知识



知识搜索服务

这些是最佳搜索结果:

Genetic Algorithms in Search, Optimization and Machine Learning
1989, David E Goldberg
Cited 18,910 times [View PDF](#)

Induction of Decision Trees
1986, Machine Learning
J R Quinlan
decision tree | expert system | machine learning | computer science
Cited 4,819 times [View PDF](#)

Outline of a New Approach to the Analysis of Complex Systems and Decision Processes
1973, IEEE Transactions on Systems, Man, and Cybernetics, issue 1, pp 28-44
Lotfi A Zadeh (University Of California Berkeley)
fuzzy set | complex systems | artificial neural network | computer simulation
machine learning | artificial intelligence | computer science
Cited 2,602 times [View Link](#)

搜索



必应搜索

这是我为您找到的:





图片分析



图片类型:

Clip Art Type	0 Non-clipart
Line Drawing Type	0 Non-Line Drawing
Black & White Image	False

图片内容:

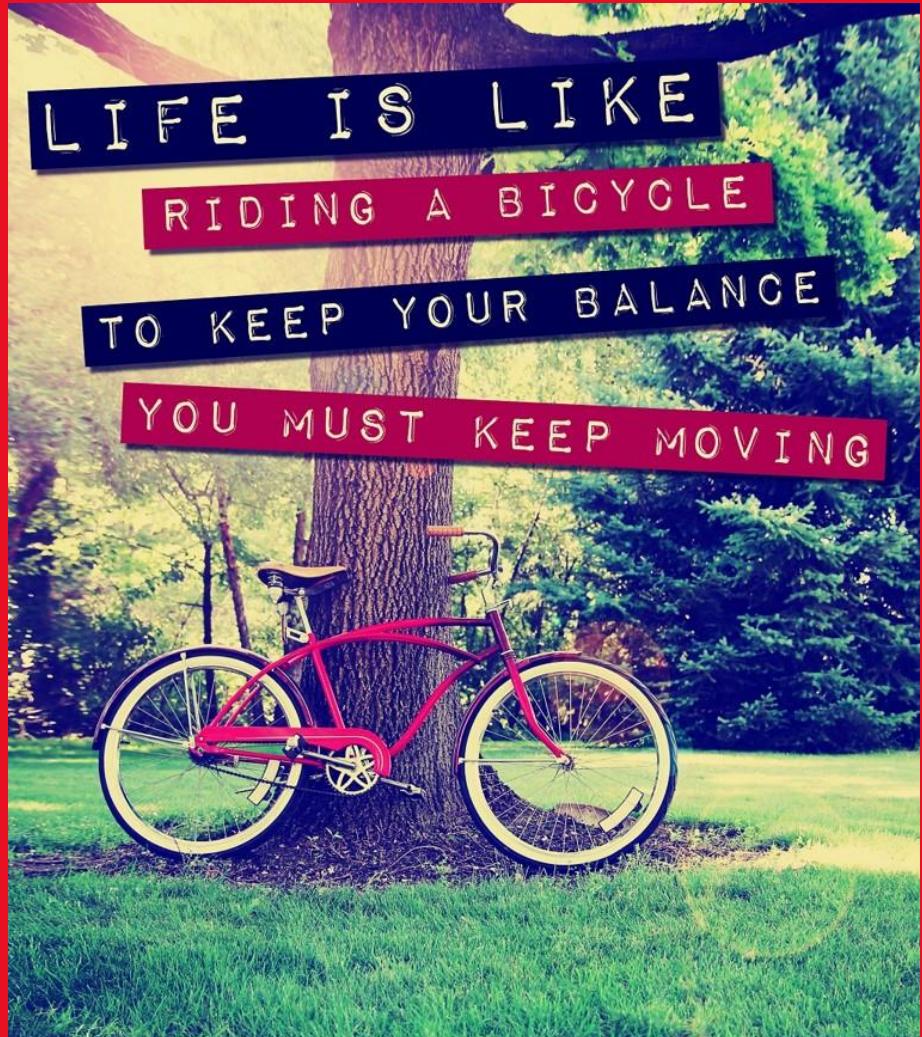
Adult Content	False
Adult Score	0.18533889949321747
Faces	[{ "age": 27, "gender": "Male", "faceRectangle": { "left": 472, "top": 258, "width": 199, "height": 199 } }]
Tags	[{ "name": "water", "confidence": 0.9996442794799805 }, { "name": "sport", "confidence": 0.9504992365837097 }, { "name": "swimming", "confidence": 0.9062818288803101, "hint": "sport" }, { "name": "pool", "confidence": 0.8787588477134705 }, { "name": "water sport", "confidence": 0.631849467754364, "hint": "sport" }]

图片色值:

Dominant Color Background	White
Dominant Color Foreground	Grey
Dominant Colors	White
Accent Color	



光学字符识别



已支持功能：

- 扫描图片
- 含有文本的图片
- 纹理致密的位置信息

有待增强功能

- 机动车牌照
- 手写文本
- 超大文本识别



人脸识别 API

人脸检测

检测图片中的人脸并识别属性

人脸验证

核对两张人脸是否属于同一个人

相似人脸搜索

从多张人脸中找出与所查人脸相似的人脸

人脸分组

根据识别的人脸进行分组

人脸辨识

查询某张人脸，与提供的数据中的何人相匹配



情感识别 API



人脸检测

```
"faceRectangle": {"width": 193, "height": 193, "left": 326, "top": 204}
```

...

情感指数

```
"scores": { "anger": 5.182241e-8,  
           "contempt": 0.0000242813,  
           "disgust": 5.621025e-7,  
           "fear": 0.00115027453,  
           "happiness": 1.06114619e-8,  
           "neutral": 0.003540177,  
           "sadness": 9.30888746e-7,  
           "surprise": 0.9952837}
```



语音API

语音识别(语音转文本)
将语音转换为文本

语音输出(文本转语音)
将文本合成语音

说话者ID & Diarisation
即将上线



声纹识别 API

声纹验证
检测两个声音是否来自于同一个人

声纹辨识
辨识出谁正在说话



语言理解智能服务

理解用户所说的话
使用来自Bing和Cortana的预构的模型或者
自己创建的模型



Future of Order Taking

drivethru.wav

Start Recognition 



Azure Machine Learning

全托管

无软件安装，硬件管理，
只需网站

整合

简单的拖拉拽，连接数据
接口，无需为通用任务编
程。.

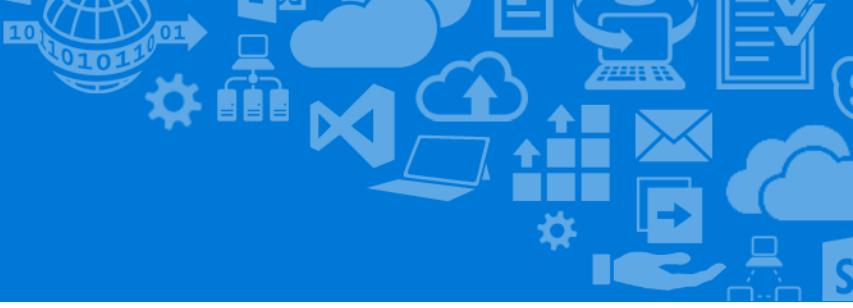
最优算法

基于最优实现的各类算
法. 支持R和Python扩展。

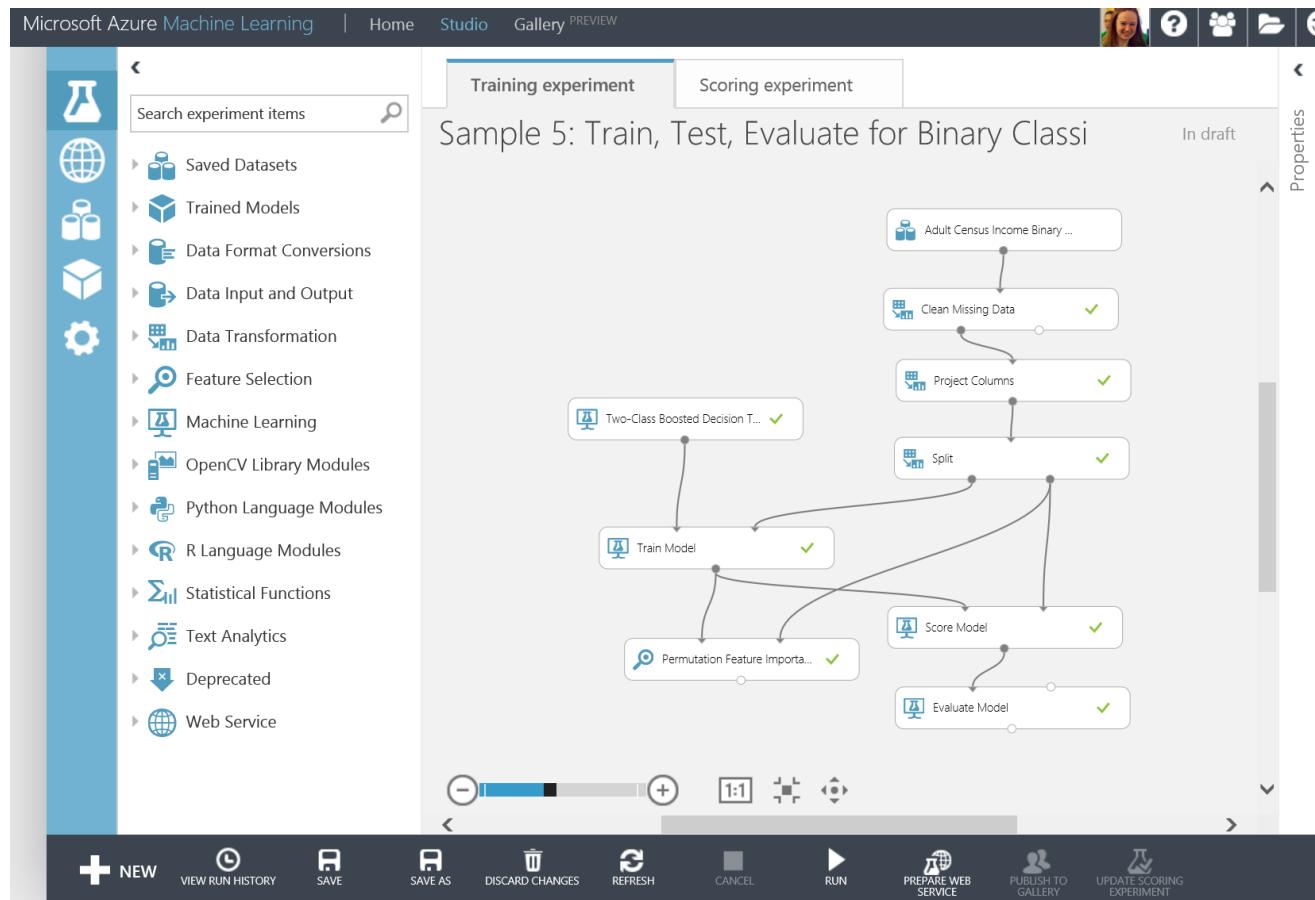
分钟级部署

点击即可操作模型，在
Machine Learning
Marketplace内收费。

ML Studio



- 通过浏览器访问，不用安装软件；
- 通过可以和任何人，在任何地点协作；
- 通过可视化的模块E2E支持数据流；
- 提供多种ML算法，模型库，利于搜索和重用；
- 支持R和Python扩展；
- 快速尝试新功能，ML算法和建模策略



Search experiment items

Training experiment Predictive experiment

Predict the remaining useful life of an aircraft engine

Finished running ✓

The screenshot shows a machine learning workflow for predicting the remaining useful life (RUL) of an aircraft engine. The process starts with an input variable "variable RUL (remaining useful life)" which feeds into an "Execute R Script" step. This step performs feature engineering, generating moving average, count, and variance for the most recent 5 recent records. The output of this step feeds into a "Project Columns" step, which excludes columns not intended for use. This is followed by a "Metadata Editor" step, which sets the column "RUL" as the label variable. The workflow then branches into two parallel paths. Each path begins with a "Decision Forest Regression" step, which outputs to a "Train Model" step. The outputs from these two "Train Model" steps then feed into two "Score Model" steps. Finally, the outputs from these two "Score Model" steps are combined and passed to an "Evaluate Model" step. The entire workflow has completed successfully, as indicated by the green checkmarks.

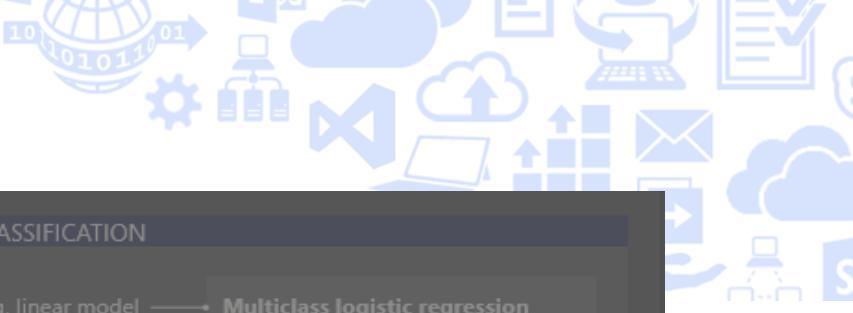
```
graph TD; A[variable RUL (remaining useful life)] --> B[Execute R Script  
Feature engineering. Generate moving average,, count, and variance for most 5 recent re ...]; B --> C[Project Columns  
Exclude columns that are not to be used]; C --> D[Metadata Editor  
set column RUL as the label variable]; D --> E[Decision Forest Regression]; E --> F[Train Model]; E --> G[Split Data]; G --> H[Boosted Decision Tree Regr...]; H --> I[Train Model]; I --> J[Score Model]; I --> K[Score Model]; J --> L[Evaluate Model]; K --> L;
```

Machine Learning

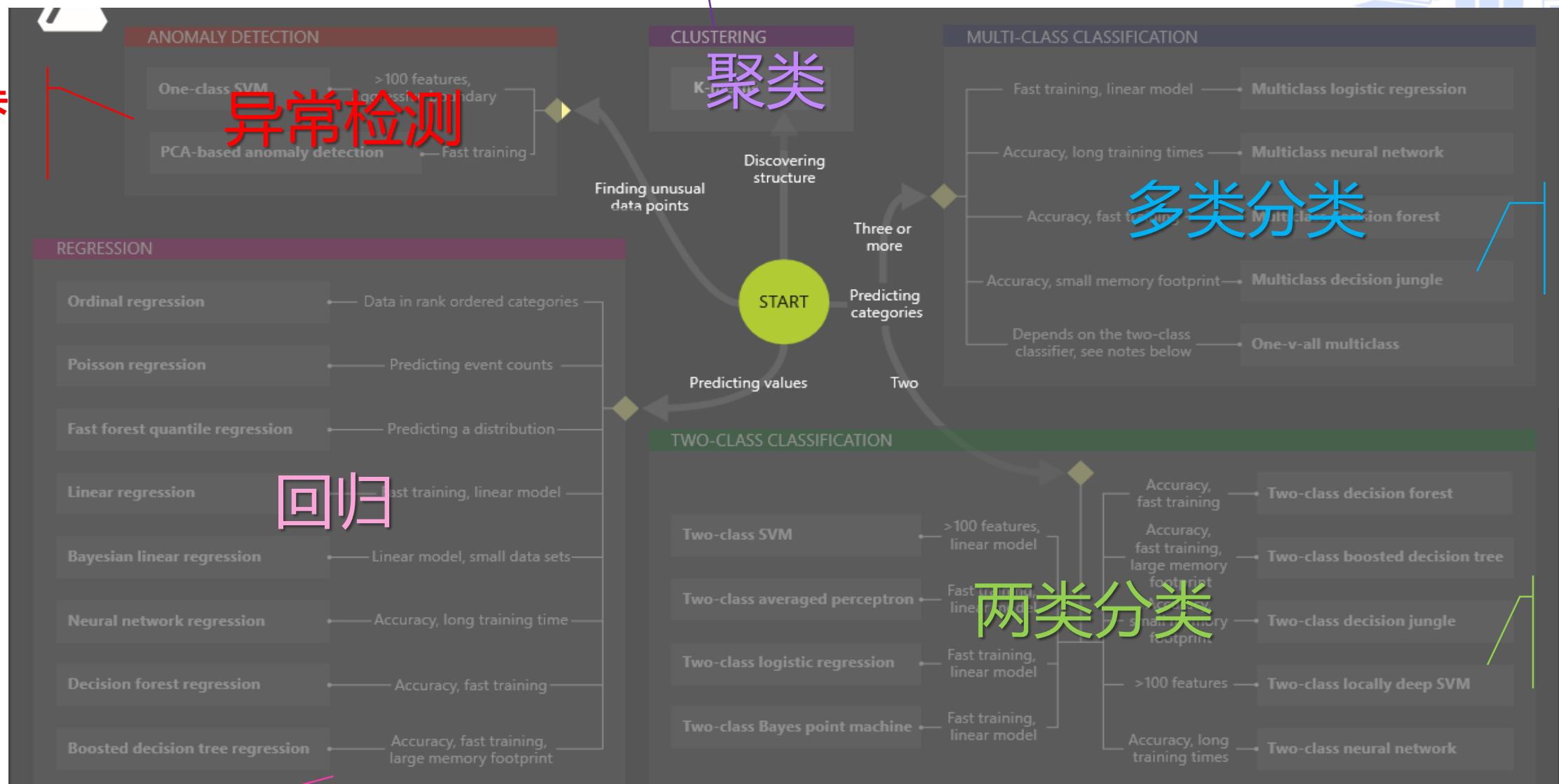
- Evaluate
- Initialize Model
 - Anomaly Detection
 - Classification
 - Clustering
 - Regression
 - Bayesian Linear R...
 - Boosted Decision ...
 - Decision Forest R...
 - Fast Forest Quantil...

+

RUN HISTORY SAVE AS DISCARD CHANGES RUN SET UP WEB SERVICE PUBLISH TO GALLERY



顾客行为分类





其他功能模块

机器学习评估

交叉验证/参数扫描/模型评估

数据处理

滤波/采样/归一化

特征选择

主成分分析/Fisher线性判别/相关性/排序

其他模块

OpenCV/统计/文本分析

微软认知工具包 (CNTK)

Research

Research areas ▾

Products & Downloads

Programs & Events ▾

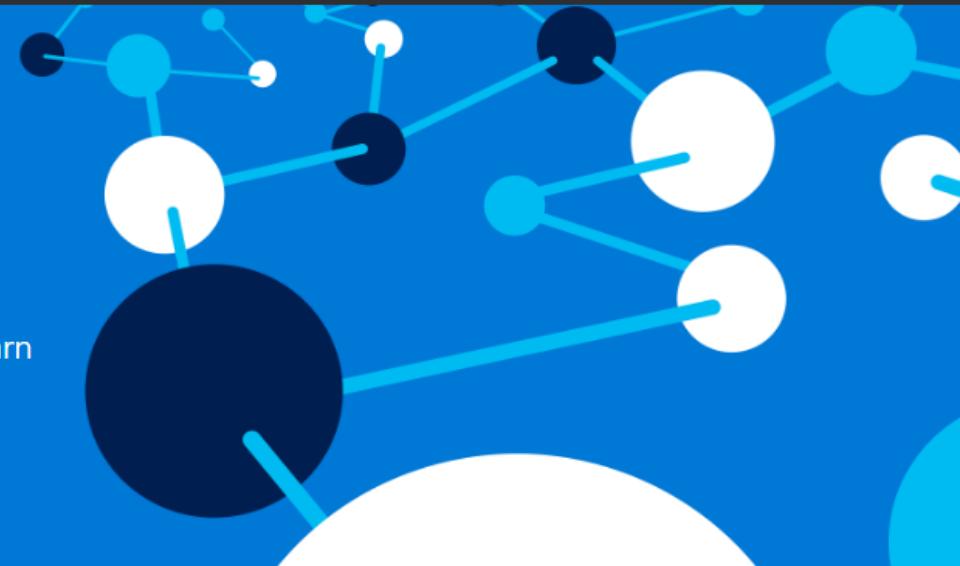
People

Careers

About ▾

The Microsoft Cognitive Toolkit

A free, easy-to-use, open-source, commercial-grade toolkit that trains deep learning algorithms to learn like the human brain.



The Microsoft Cognitive Toolkit

Features

Getting Started

Model Gallery

Tutorials

Articles

Documentation

The Microsoft Cognitive Toolkit—previously known as CNTK—empowers you to harness the intelligence within massive datasets through deep learning by providing uncompromised scaling, speed and accuracy with commercial-grade quality and compatibility with the programming languages and algorithms you already use. Hear about the [team that developed the Cognitive Toolkit](#), or read more below.

Unlock deeper learning with the new Microsoft Cognitive Toolkit



Azure GPU VM powers HPC



N-series VM

- NC VM: Tesla K80
- NV VM: Tesla M60

INSTANCE	CORES	RAM	DISK SIZES ¹	GPU
NC6	6	56.00 GiB	340 GB	1X K80
NC12	12	112.00 GiB	680 GB	2X K80
NC24	24	224.00 GiB	1,440 GB	4X K80
NC24r	24	224.00 GiB	1,440 GB	4X K80

Support System:

- CentOS
- Ubuntu
- Windows Server

INSTANCE	CORES	RAM	DISK SIZES ¹	GPU
NV6	6	56.00 GiB	340 GB	1X M60
NV12	12	112.00 GiB	680 GB	2X M60
NV24	24	224.00 GiB	1,440 GB	4X M60

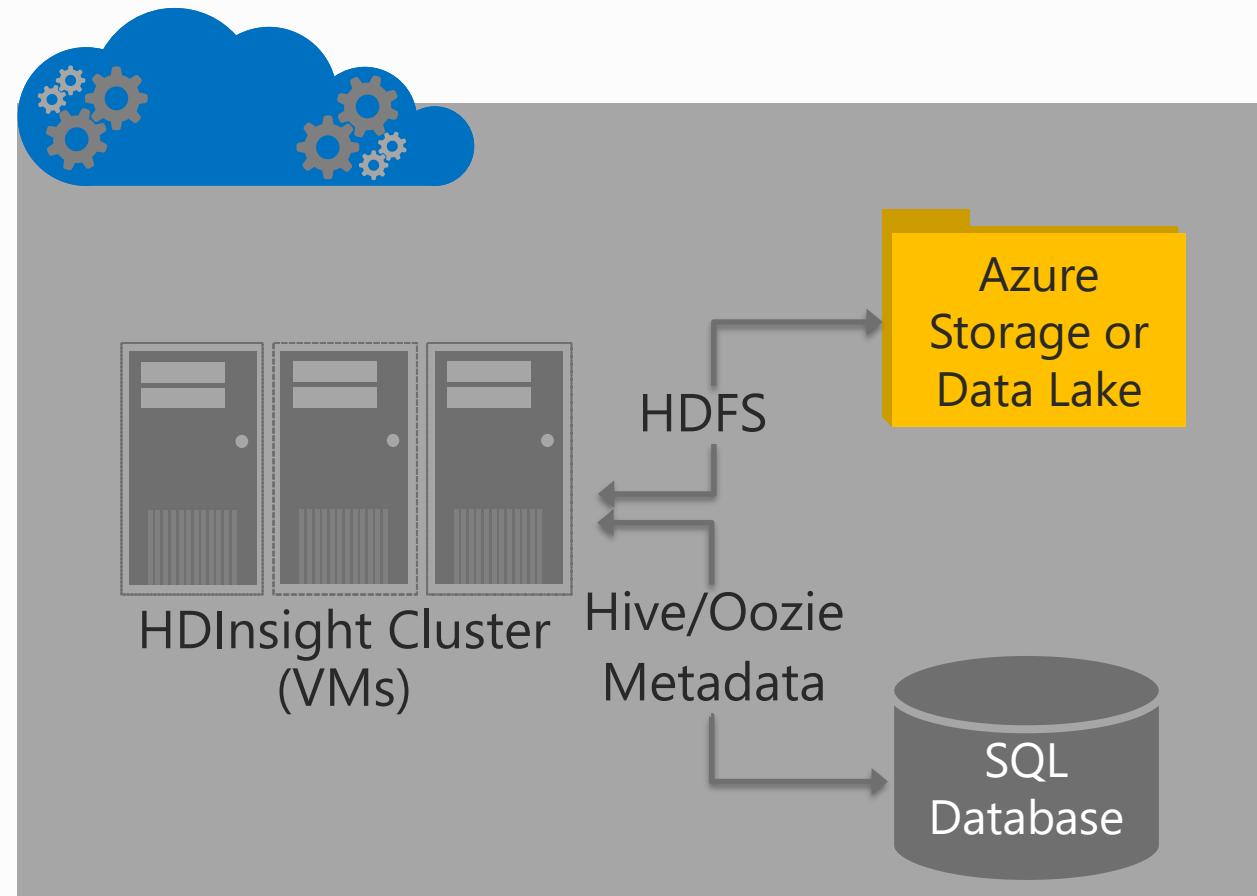
Variety, Velocity, and Volume (3V)

使用传统方法无法处理分析如此多、如此复杂或者变化如此快速的数据

术语	定义
Volume	大量的数据
Variety	结构化和非结构化数据混合
Velocity	大量新的数据生成迅速

什么是HDInsight?

HDInsight 是微软在Azure上部署Hadoop集群的基础设施



HDInsight Cluster on Azure

Data + Analytics

 Cognitive Services APIs
Microsoft Cognitive Services lets you build apps with powerful algorithms using just a few lines of code.

 Data Catalog
Data source discovery to get more value from existing enterprise data assets

 HDInsight
Microsoft's cloud-based Big Data service. Apache Hadoop and other popular Big Data solutions.

 Data Lake Analytics
Big data analytics made easy

 Machine Learning
Build, deploy and share advanced analytics solutions

 Data Factory
Transform data into trusted

New HDInsight Cluster

* Cluster Name
 .azurehdinsight.net

* Subscription
BizSpark >

Select Cluster Type ⓘ ! >
Configure required settings

* Credentials
Configure required settings 

* Data Source ⓘ
Configure required settings 

* Node Pricing Tiers
Please configure required settings 

Optional Configuration 

Cluster Type configuration

Learn about HDInsight and cluster versions. [Learn more](#)

Cluster Type ⓘ

- Hadoop
- HBase
- Storm
- Spark (Preview)
- R Server on Spark (Preview)

Operating System

Linux Windows

PREMIUM (PREVIEW) ★

 Administration Manage, monitor, connect
 Scalability On-demand node scaling
 Please select cluster configurations Automatic patching
 Microsoft R Server for HDInsight

Unable to display pricing

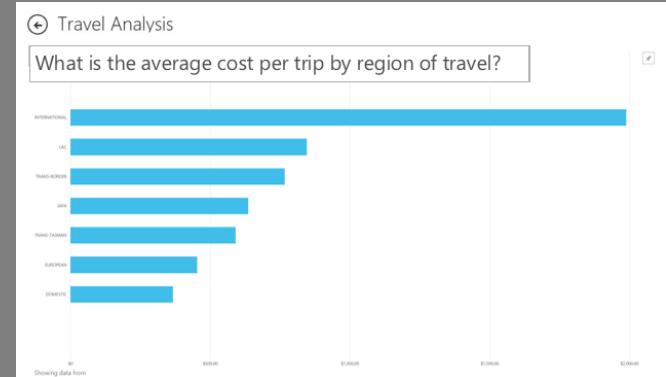
 Administration Manage, monitor, connect
 Scalability On-demand node scaling
 Please select cluster configurations Automatic patching
Unable to display pricing

Power BI基本功能

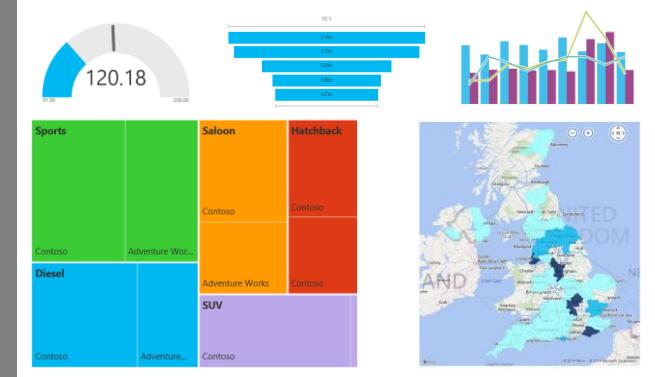
实时面板和报告



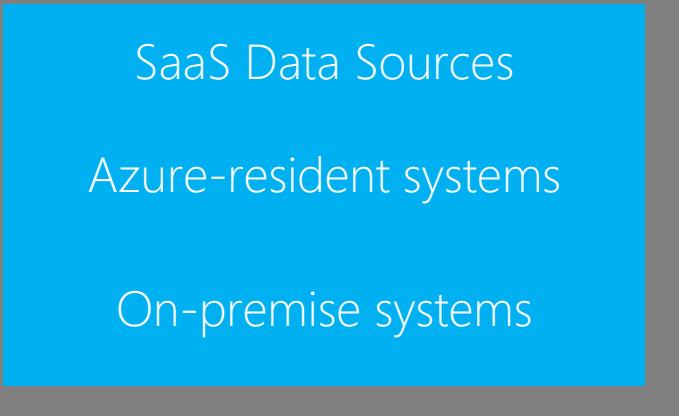
自然语言查询



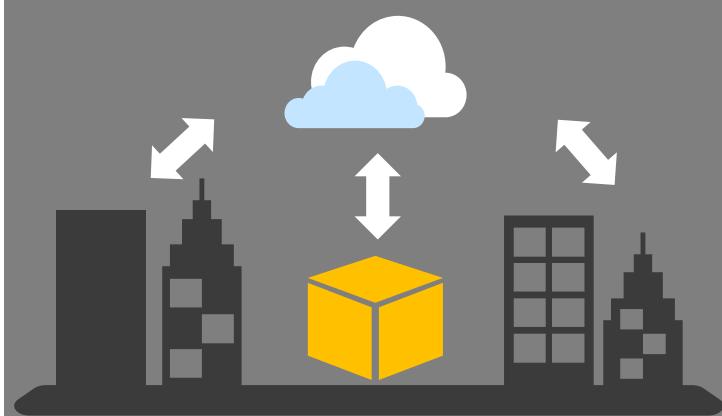
可视化新方式



连接所有数据



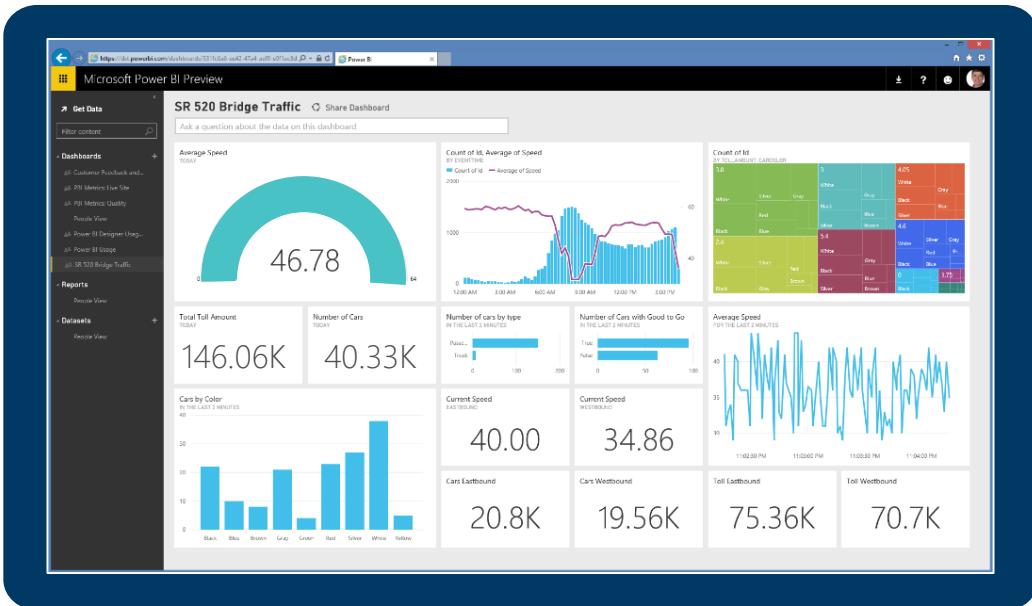
随时随地分享



支持所有设备



在单一面板查看所有数据 在线仪表板和交互报告

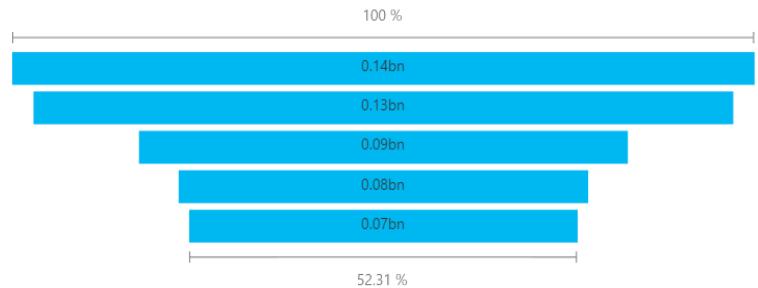


- 展示：监视在线仪表板中关心的数据
- 实时：基于实时流数据的支持跟踪数据
- 布局：可视化图表和KPI钉在报告中，以监视性能
- 分层：分层报表实现钻取场景

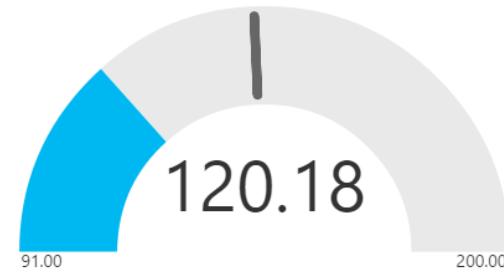
可视化数据的新方式

多样化和定制化的 Power BI 视图

Funnel



Gauge



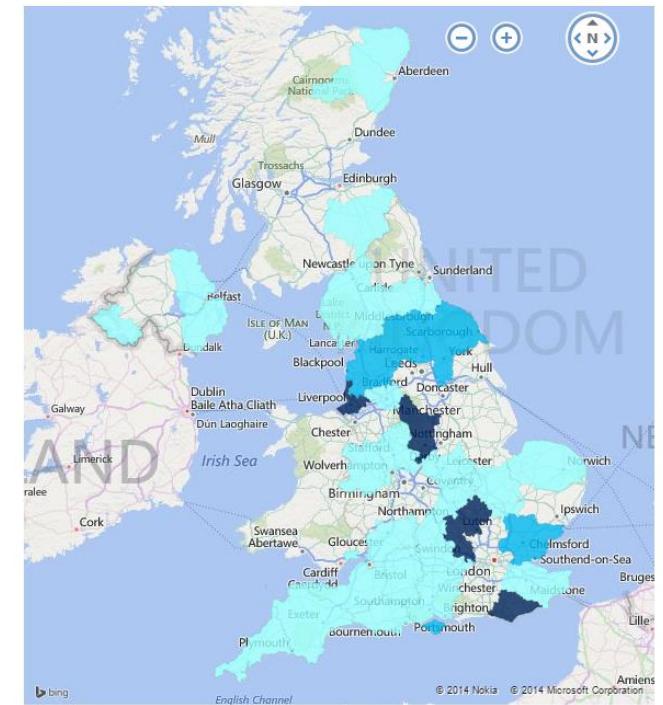
Combo Chart



Tree Map



Fill Map



连接本地及云上各种数据源

MICROSOFT CLOUD

Azure Storage OneDrive Sharepoint
Azure SQL DB Stream Analytics
Azure SQL Warehouse Spark on HDInsight

OTHERS



ON-PREMISE DATA



从各种设备连接



- ➔ 有Native App: iOS, Android , Windows,数据有更新时得到推送
- ➔ Desktop版：数据高级查询功能
- ➔ Embedded: 报告嵌入网站和应用中



Windows



iOS



Android



HTML5

予力全球每一人每一组织成就非凡



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