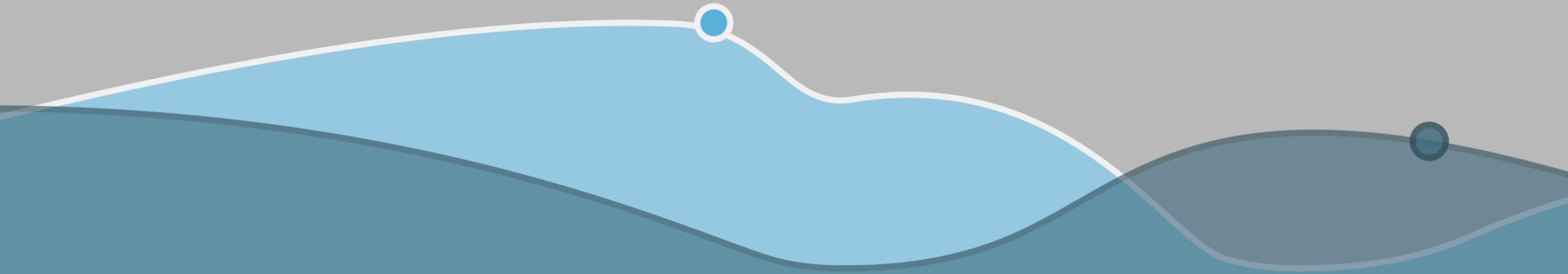




Cortana Analytics Workshop

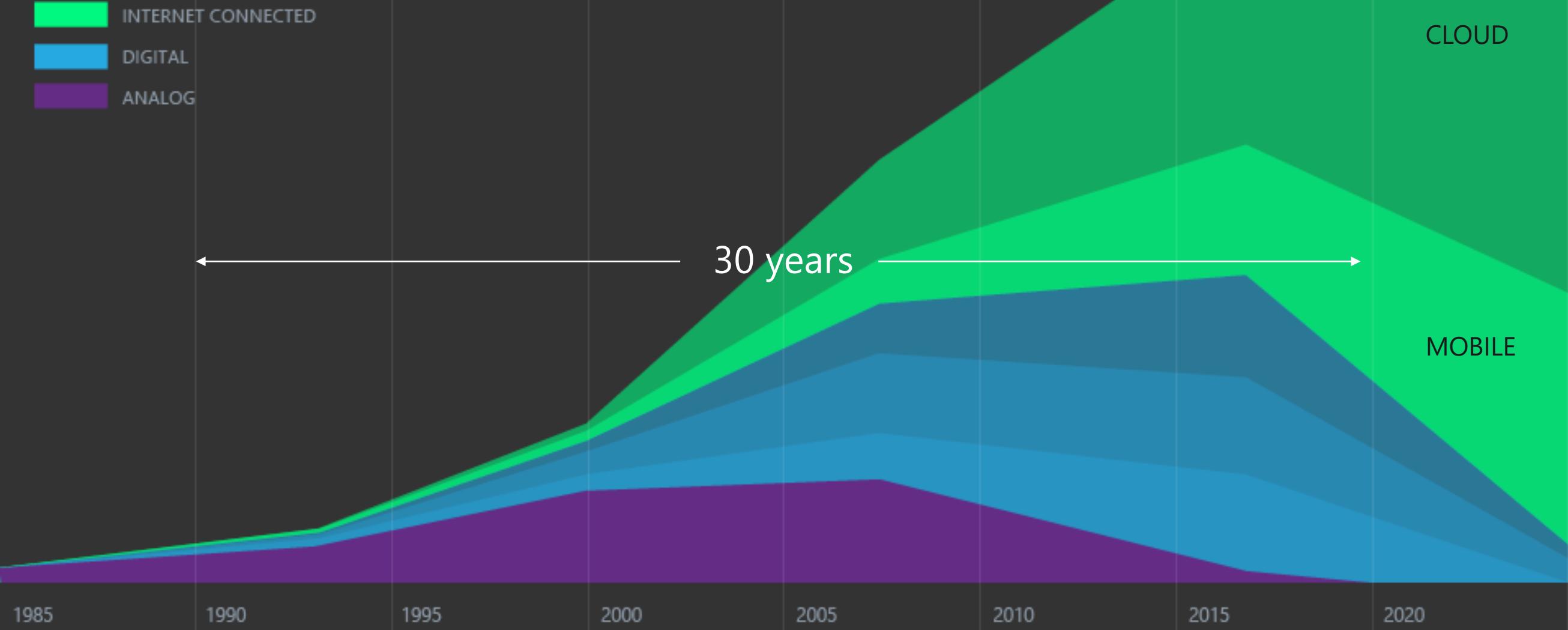
Sept 10 – 11, 2015 • MSCC



The Future of Analytics

Joseph Sirosh
Corporate VP, Microsoft

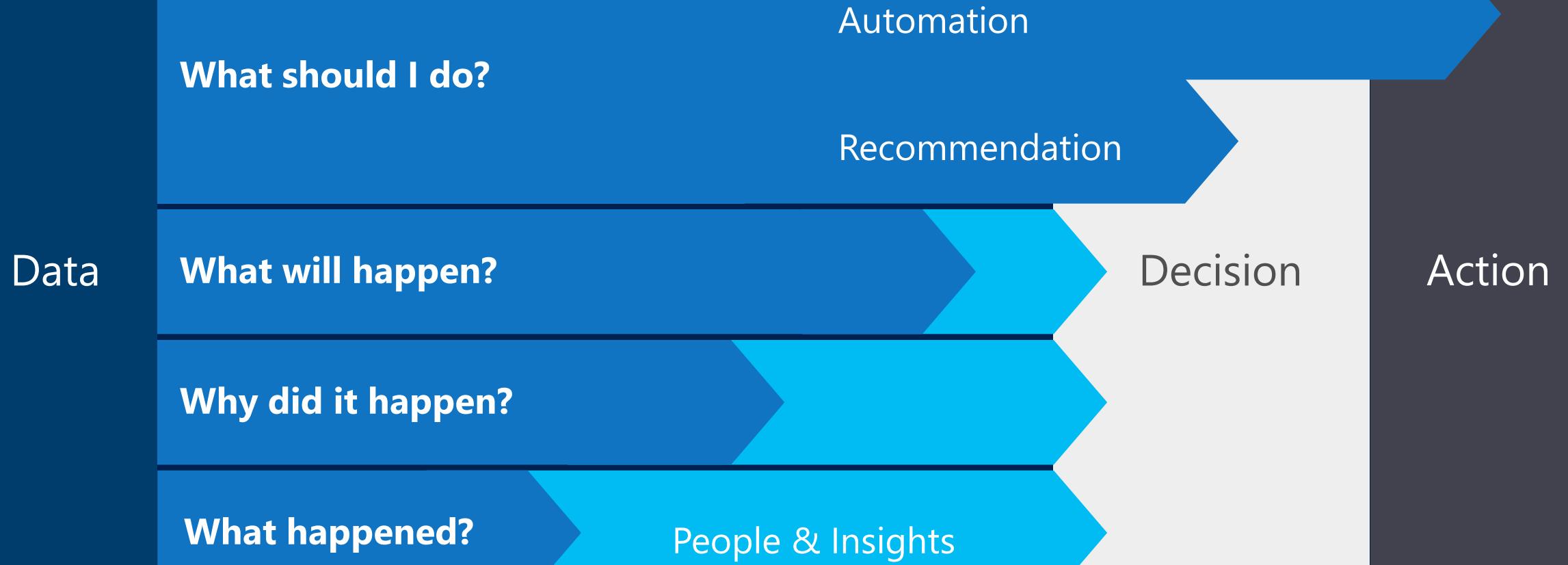
Connected data



events → data → intelligence

people → insights

rules → automation



Cortana Analytics Suite: Transform Data to Intelligent Action



Differentiators – The Top 10

1. **Capacity:** {small data, big data} X {volume, velocity, variety}
2. **Platform:** Storage, compute, real-time ingest, connectivity to all your data, information management, big data environments, advanced analytics, visualization, IDEs
3. **Assistive Intelligence:** Cortana
4. **Apps:** Vertical toolkits, hosted APIs, finished industry applications
5. **Features:** Elastic, Fully-managed, Economic, Open Source R/Python
6. **Capabilities:** Hyper-scale, Enterprise Grade, Hybrid
7. **Facilitators:** Training, Professional services, Data Science, Partner Ecosystem, Marketplace
8. **Secure, Compliant, Auditable.**
9. **One simple subscription model**
10. **Future Proof, with the research of MSR/Bing and the fastest pace of product innovation**

We believe Analytics should be *Agile, Simple, Beautiful*

- **Fully managed cloud services – end to end**
 - Fire it up and go – instantly.
- **An Integrated Platform**
 - No heavy lifting to integrate diverse “best-of-breed” products.
 - One “throat to choke” for customers.
- **A very simple way to purchase – a cloud subscription.**
- **Productize, Simplify & Democratize – not a services play!**
- **Partner ecosystem for creating solutions, not wrangling tech.**



Agile, Simple, Beautiful.



How-Old.net

Demo



Search Faces...



[Use This Photo](#)



[Use your own photo](#)

Max Photo Size 3MB

[Read the story behind this demo](#)

[Privacy & Cookies](#) | [Terms of Use](#)





Machine Learning APIs

[VIEW ALL](#)

MACHINE LEARNING API

Face APIs



Microsoft's state-of-the-art cloud-based face algorithms to detect and recognize human faces in images.

[Face](#) [Image](#) [Vision](#)

149

2 days ago

Microsoft

MACHINE LEARNING API

Recommendations



Help your customers discover items in your catalog. Customer activity in your website is used to recommend items and improve conversion in your store.

[Recommendations](#) [Retail](#)

147

2 days ago

Microsoft

MACHINE LEARNING API

Speech APIs



Easily include speech driven actions into your applications using algorithms to process spoken language.

[Speech](#) [Text](#) [Intent](#)

130

2 days ago

Microsoft

MACHINE LEARNING API

Text Analytics



Bring your unstructured text, and use this API to perform sentiment analysis and key phrase extraction.

[Speech](#) [Text](#) [Intent](#)

96

2 days ago

Microsoft

MACHINE LEARNING API

Vision APIs



Image processing algorithms designed to return information based on visual content and generate your ideal thumbnail.

[OCR](#) [Image](#) [Vision](#)

81

2 days ago

Microsoft

Trending experiments

[VIEW ALL](#)

EXPERIMENT

EXPERIMENT

EXPERIMENT

EXPERIMENT

EXPERIMENT



Search for entities by name, algorithms or tags



Discover. Learn. Share.

[Learn more ▾](#)

MACHINE LEARNING API

Face APIs

Microsoft's state-of-the-art cloud-based face algorithms to detect and recognize human faces in images.

[Face](#) [Image](#) [Vision](#)

149 2 days ago

Microsoft



Machine Learning APIs

[VIEW ALL](#)

MACHINE LEARNING API

Face APIs

MACHINE LEARNING API

Recommendations

MACHINE LEARNING API

Speech APIs

MACHINE LEARNING API

Text Analytics

MACHINE LEARNING API

Vision APIs

 Search for entities by name, algorithms or tags

MACHINE LEARNING API



Face APIs

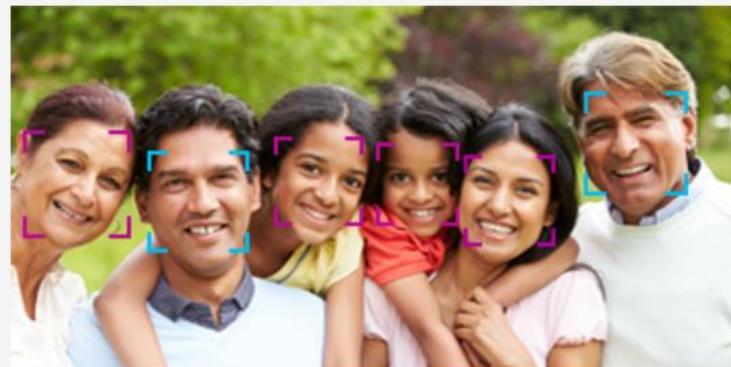
by Microsoft April 22, 2015

Description

Part of Microsoft Project Oxford, Face APIs provide state-of-the-art algorithms to process face images, like face detection with gender and age prediction, recognition, alignment and other application level features.

Face detection with attributes extraction

You will get the detected faces with rectangles indicating the face positions and a series of face related attributes, include landmarks, pose, gender and age by giving an image.



Face Verification

Given two detected faces, you will get result indicates whether the two requested faces belong to the same person.

[SIGN UP](#)[TRY IT NOW](#)

149 views

Tweet

Share



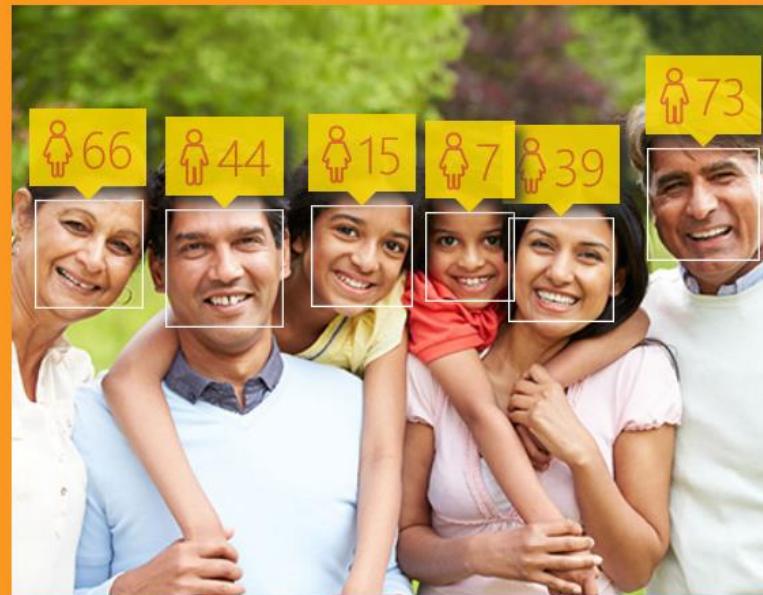
Links

[Project Oxford](#)[Publisher Offer Terms](#)



How-Old.net

Demo



Sorry if we didn't quite get the age and gender right – we are still improving this feature

 Try Another Photo!

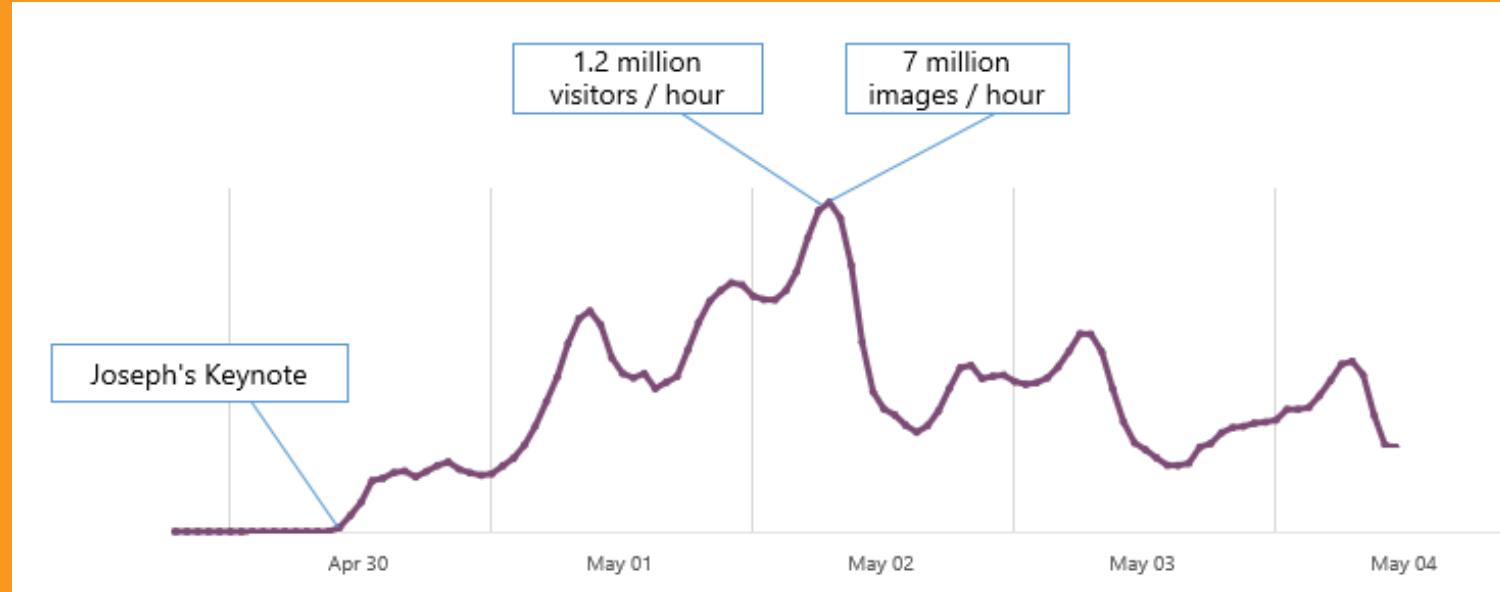
[Read the story behind this demo](#)

[Privacy & Cookies](#) | [Terms of Use](#) | [View Source](#)



```
{  
  "event_datetime": "2015-04-25T04:32:14.0075893Z",  
  "user_id": "2a23cf418af14f09b8aaa7500e392be8",  
  "session_id": "d8b3fb18-27ec-455c-8ac6-e2f19842c99d",  
  "submission_method": "Search",  
  "face": {  
    "age": 23.0,  
    "gender": "Female"  
  },  
  "user_agent": "Mozilla/5.0 (Windows NT 6.3; WOW64; Trident/7.0; Touch; rv:11.0) like Gecko",  
  "location": {  
    "latitude": 47.68,  
    "longitude": -122.12  
  },  
  "location_city": {  
    "latitude": 47.7,  
    "longitude": -122.1  
  },  
  "is_mobile_device": false,  
  "browser_type": "InternetExplorer",  
  "platform": "Windows",  
  "mobile_device_model": "Unknown"  
}
```

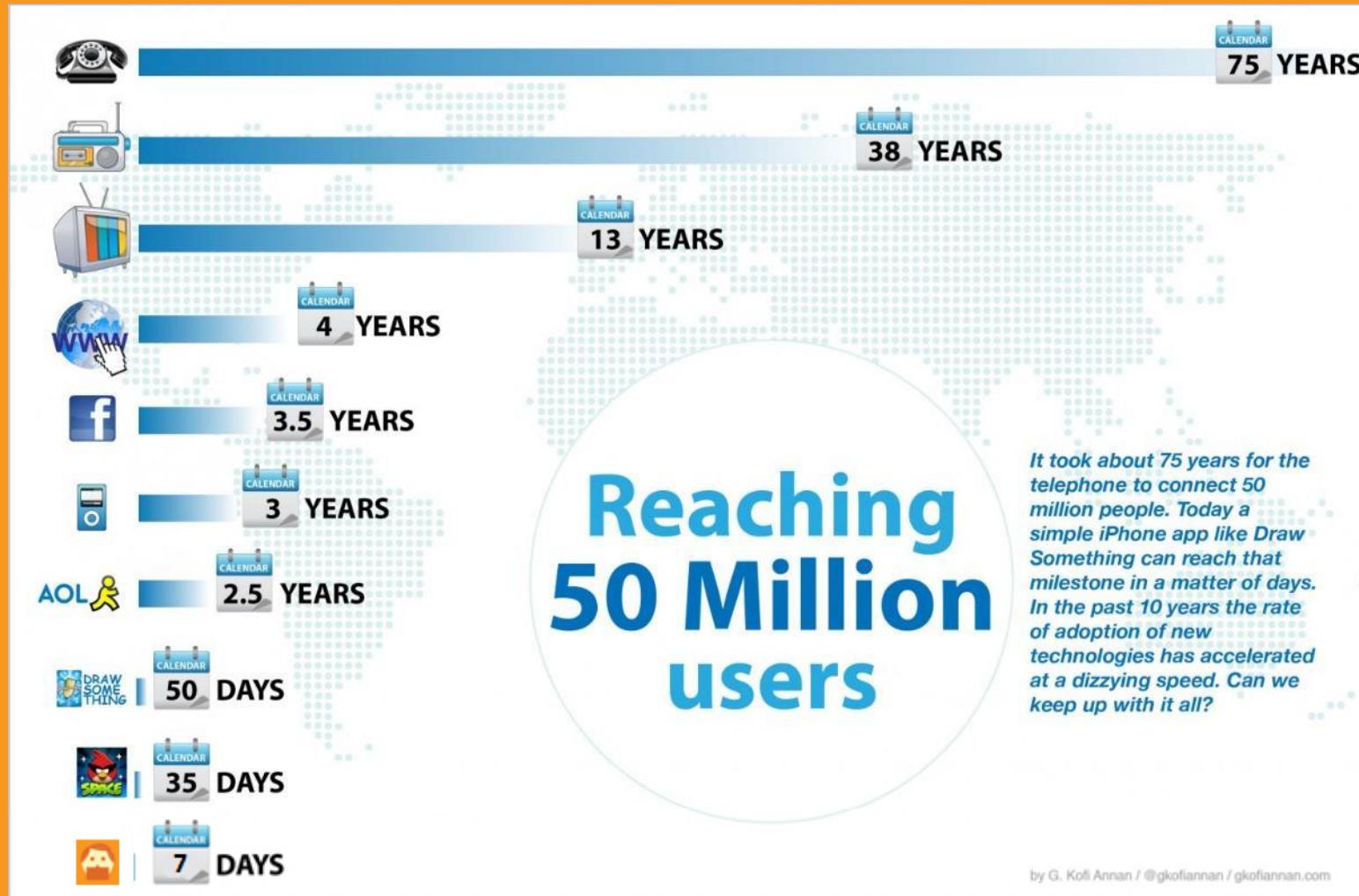
The internet is insane - Azure is awesome!



- As of today
 - 82 million unique users
 - 565 million images
 - 10+ million blog reads
- At peak
 - 1600 cores
 - 5.6 TB RAM
 - Over 2000 images per second

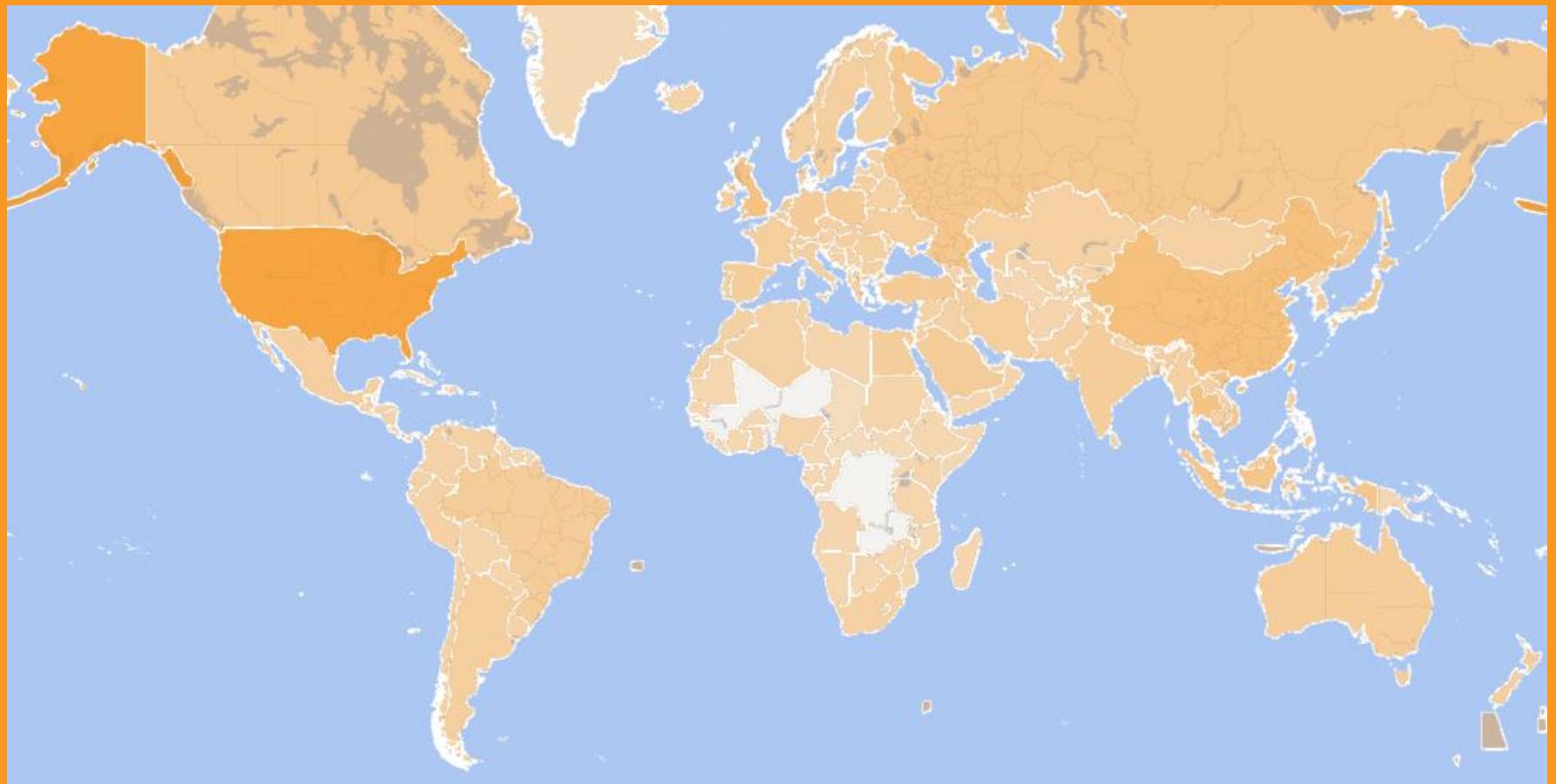
1 developer – no downtime

50 million users in perspective



A global phenomenon

- Used in almost every Country in the world
- US - 12 million
- Taiwan - 5 million
- China – 4 million
- Iran – 300k
- North Korea - 20



In the Media

Over 106K pages with links to the site



In the social sphere

As of Today

- 2.2 million Facebook posts
- 45K Instagram posts
- 142K tweets



Arianna Huffington @ariannahuff · May 2
It must be all that extra sleep! #Thrive #HowOldRobot

The image shows a screenshot of a tweet from Arianna Huffington (@ariannahuff) dated May 2. The tweet includes her profile picture and a link to the How-Old.net app. Below the tweet is a screenshot of the app showing a portrait of Arianna Huffington with a yellow speech bubble overlay containing the number '31'.

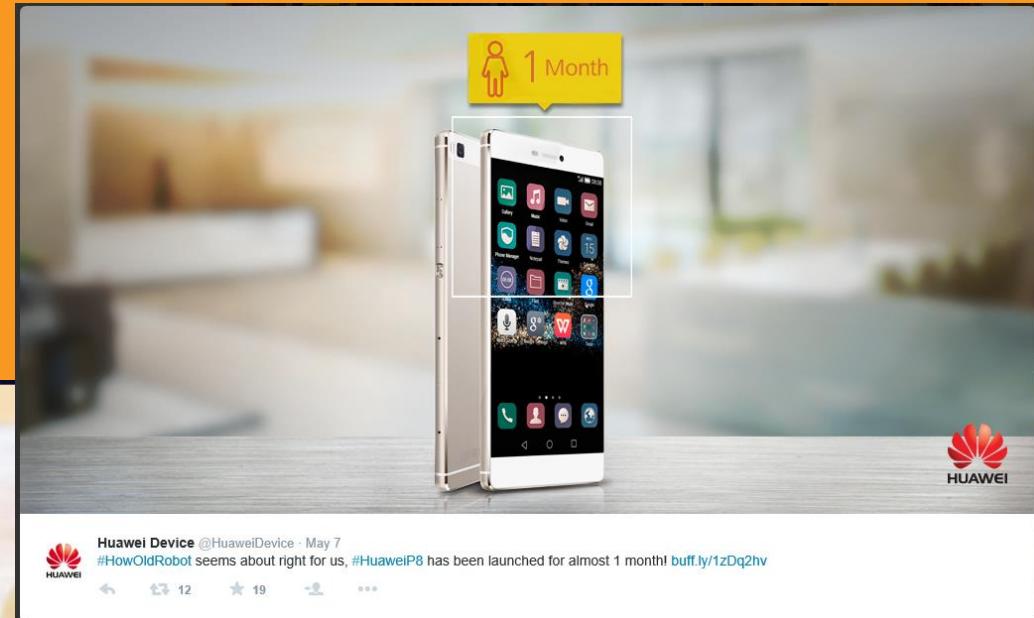
During //Build

- #1 trending topic on twitter
- 80% of the conversation about MS

Amelia Talon @AmeliaTalon · May 9
I am laughing so hard right now. I guess gray hair shaves off quite a few years for me. #HowOldRobot

The image shows a screenshot of a tweet from Amelia Talon (@AmeliaTalon) dated May 9. The tweet includes her profile picture and a link to the How-Old.net app. Below the tweet is a screenshot of the app showing a portrait of a woman with grey hair, overlaid with a yellow speech bubble containing the number '11'. A large black diagonal banner across the bottom of the image reads 'CENSORED'. In the top right corner of the image frame, there is a small link 'View photo'.

Companies talked about their products



People talked about important issues



PETA @peta · May 1
Lolita was captured when she was approx. 4 years old.

She's been in captivity for 44 YEARS. #FreeLolita #HowOldRobot

NOTHING STEALS YOUTH LIKE THE STREET.

Cale is actually 22. "The past month I've been on the street. I want to be stable and help my friends out. I'm originally from Ottawa, but have been all over."

Covenant House Toronto helps thousands of homeless youth.
Cale was in this photo to raise awareness. Please share or donate.



How-Old.net
HOW OLD DO I LOOK? #HowOldRobot

Sorry if we didn't quite get the age and gender right – we are still improving this feature.



How-Old.net
HOW OLD DO I LOOK? #HowOldRobot

Couldn't detect any faces.

Sorry if we didn't quite get the age and gender right – we are still improving this feature.

Basima Faysal @BasimaFaysal · Apr 30
#HowOldRobot: Total rubbish.

Nearly 50 people and it couldn't recognise a single face.

And not so important issues



KONAMI UK @KonamiUK · May 1
#HowOldRobot has declared Old Snake to be... not too old at all, at 46! And our winner is: @JamilAlio. Well done!

A photograph of Old Snake from the Metal Gear Solid video game series. A white rectangular box highlights his forehead and eyes. A yellow speech bubble with a red diamond icon containing the number '46' is positioned above the box.



How-Old.net
HOW OLD DO I LOOK? #HowOldRobot

Couldn't detect any faces.

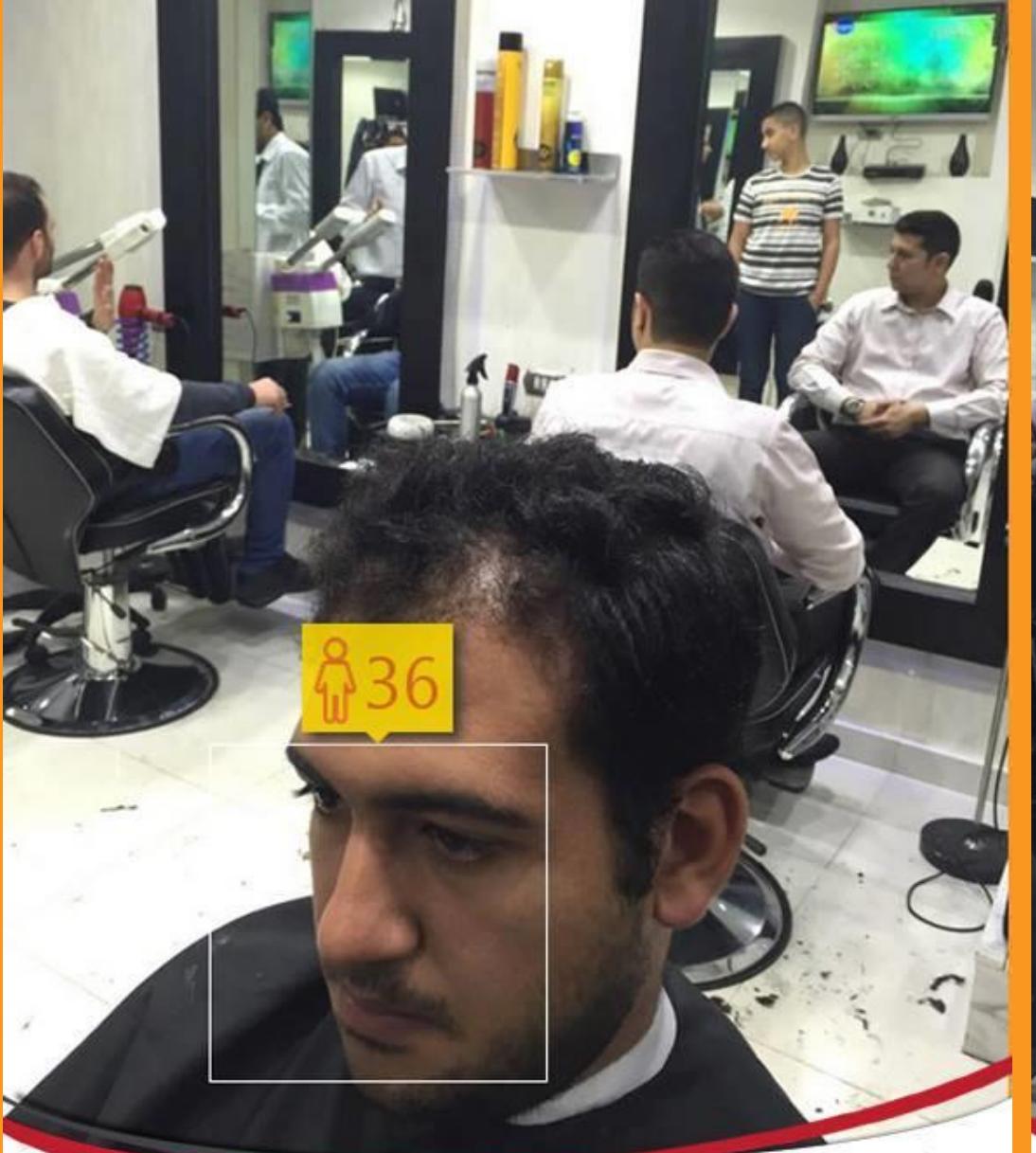
A placeholder image for the How-Old.net service, showing a man's body in a suit and tie with a large, stylized red and orange striped head.

Bacon 4 President @Bacon4Pres · May 2
I'm immortal, apparently. #HowOldRobot #FAIL

4 1 1 1 ...

We also made the world a less hairy place





Ali & Hussein
Coiffure and Spa

How old do
you look?

103 ش. الإمام علي - ميدان الإسماعيلية - مصر الجديدة
0115200051

A.HCoiffureSpa



Ali & Hussein
Coiffure and Spa

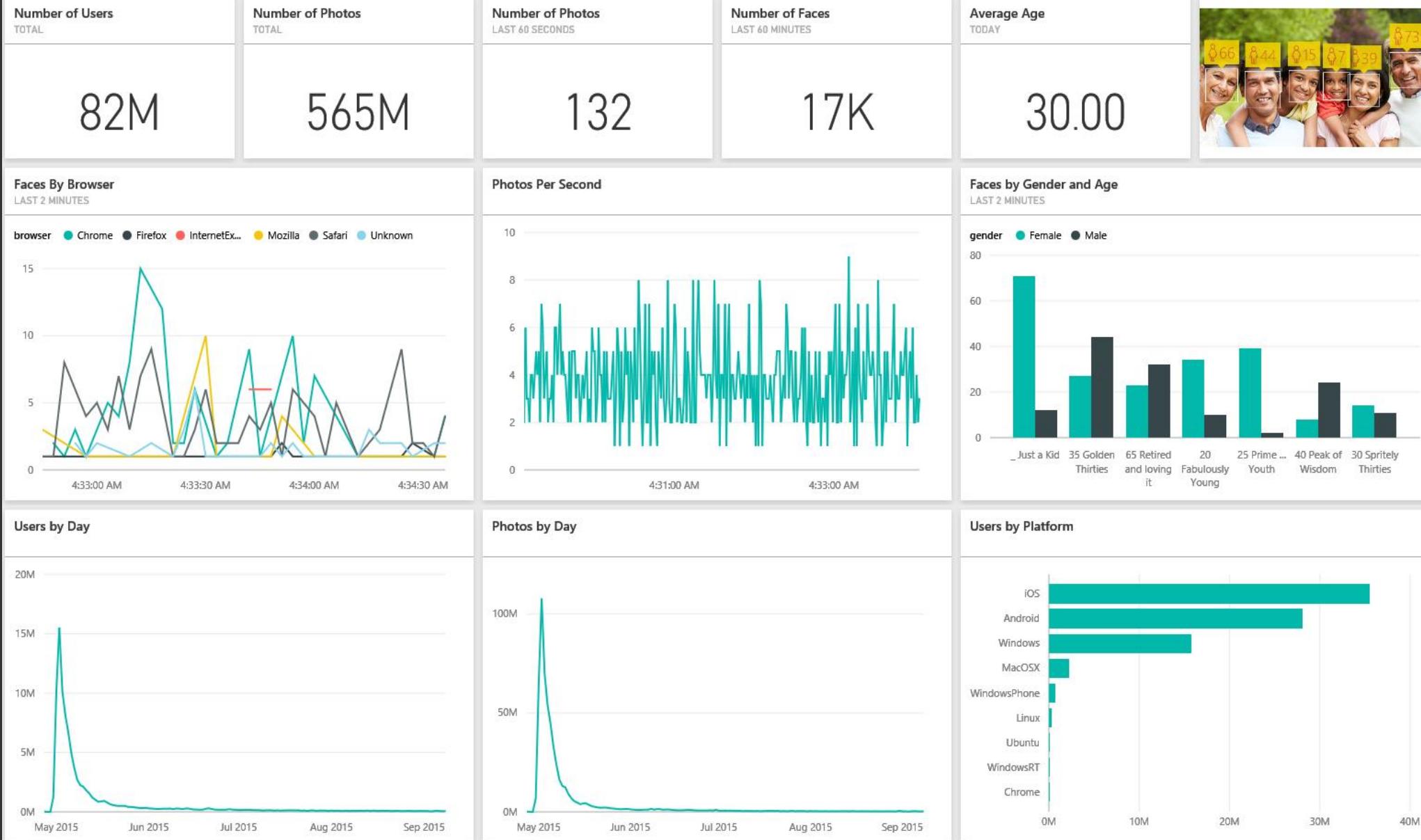
How old do
you look?

103 ش. الإمام علي - ميدان الإسماعيلية - مصر الجديدة
0115200051

A.HCoiffureSpa

See it in action
How Old Do I Look?

Ask a question about the data on this dashboard





Event Hubs

Cloud-scale telemetry ingestion from websites, apps, and devices

- ✓ Log millions of events per second in near real time
- ✓ Connect devices with flexible authorization and throttling
- ✓ Time-based event buffering
- ✓ Managed service with elastic scale
- ✓ Broad platform reach with native client libraries
- ✓ Pluggable adapters for other cloud services

[Get started for free >](#)

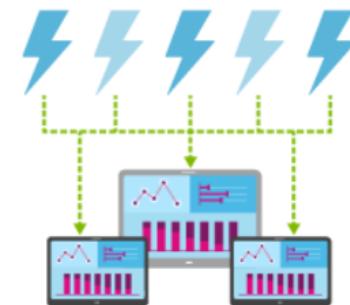
[Pricing details ▾](#)

[Documentation ▾](#)



Stream millions of events per second into multiple applications

Event Hubs is a highly scalable publish-subscribe ingestor that can intake millions of events per second so that you can process and analyze the massive amounts of data produced by your connected devices and applications. Once collected into Event Hubs you can transform and store data using any real-time analytics provider or with batching/storage adapters.



Enable applications to process events with variable load profiles

Today's connected world is defined by big data. Big data originates from many sources such as



Stream Analytics

Real-time stream processing in the cloud

- ✓ Perform real-time analytics for your Internet of Things solutions
- ✓ Stream millions of events per second
- ✓ Mission critical reliability, performance and predictable results
- ✓ Create real time dashboards and alerts over data from devices and applications
- ✓ Correlate across multiple streams of data
- ✓ Rapid development with familiar SQL-based language

[Get started for free >](#)

[Pricing details ▾](#)

[Documentation ▾](#)



Uncover Real-time Insights

Learn how Microsoft's stream analytics service in the cloud enables you to rapidly develop and deploy a low cost real-time analytics solution to uncover real-time insights from devices, sensors, infrastructure, and applications. It will enable various opportunities including Internet of Things (IoT) scenarios such as real-time remote management and monitoring or gaining insights from devices like mobile phones or connected cars.



Enable rapid development

Reduce friction and complexity when developing analytic functions for scale-out distributed systems with fewer lines of code. Developers simply describe their desired transformation with SQL-based queries.

query

Query can't be edited while a job is running.

```
1 SELECT
2     Count(*) as totalcount,
3     browser_type AS browser,
4     System.Timestamp as date
5 FROM streaminput
6 Group by TumblingWindow(s, 3), browser_type
```



Data Factory

Compose and orchestrate data services at scale

- ✓ Create, schedule, orchestrate, and manage data pipelines
- ✓ Visualize data lineage
- ✓ Connect to on-premises and cloud data sources
- ✓ Monitor data pipeline health
- ✓ Automate cloud resource management

Get started >

Pricing details ▾

Documentation ▾

Customers using Azure Data Factory



HDInsight

Our 100% Apache Hadoop-based service in the cloud

- ✓ Scale to petabytes on demand
- ✓ Process unstructured and semi-structured data
- ✓ Develop in Java, .NET, and more
- ✓ No hardware to buy or maintain
- ✓ Deploy in Windows or Linux
- ✓ Spin up a Hadoop cluster in minutes
- ✓ Visualize your Hadoop data in Excel
- ✓ Easily integrate on-premises Hadoop clusters

Try HDInsight for free >

Pricing details ▾

Documentation ▾

Storm ▾

Apache Spark ▾



Customers building Hadoop in Azure



Data factory



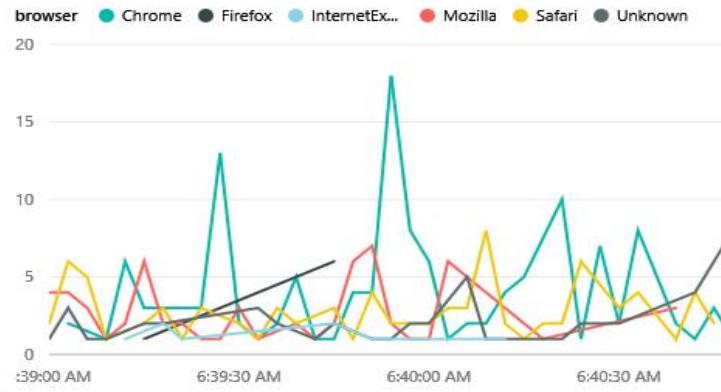
How Old Dashboard: how-old.net

[Share Dashboard](#)

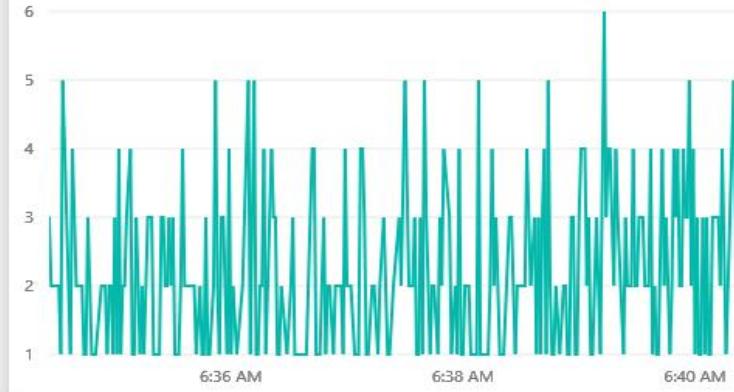
Ask a question about the data on this dashboard



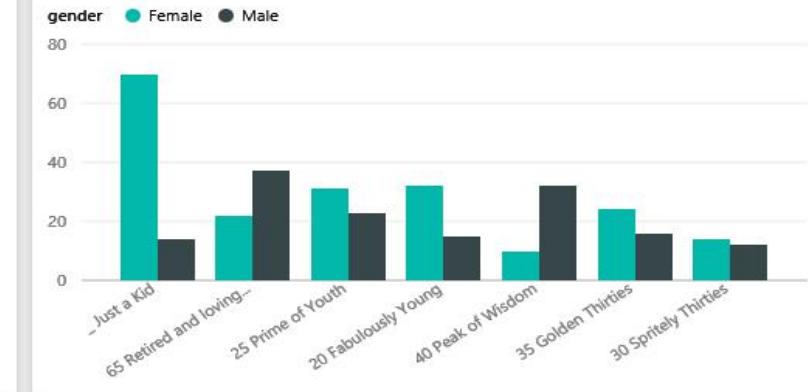
Faces By Browser
LAST 2 MINUTES



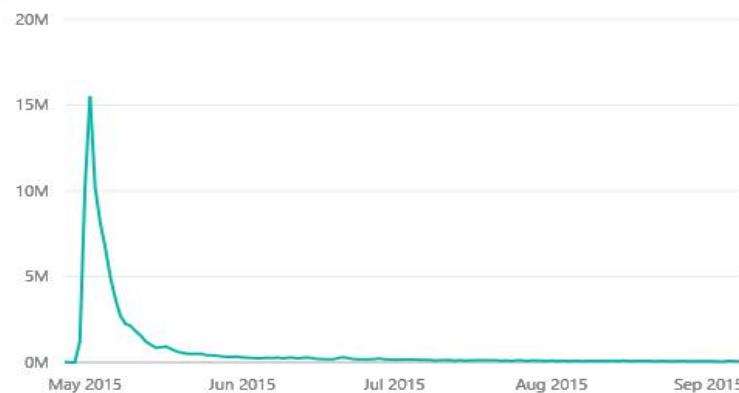
Photos Per Second



Faces by Gender and Age
LAST 2 MINUTES



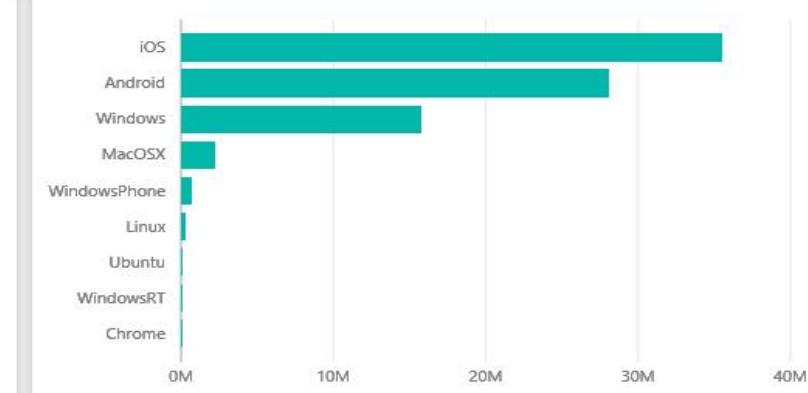
Users by Day



Photos by Day



Users by Platform



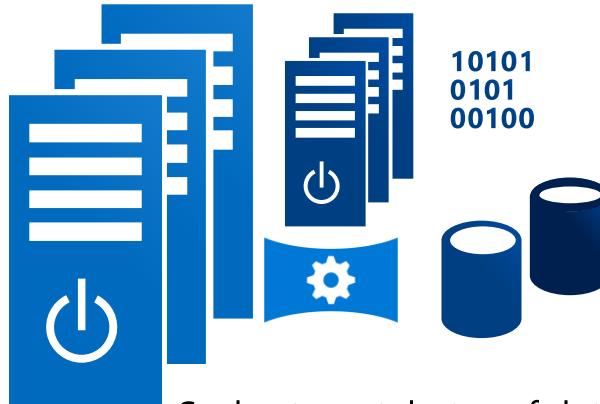


Agile, Simple, Beautiful.

Azure SQL DW

Industry first Elastic DW as a fully managed service

Elastic scale & performance



Scales to petabytes of data

Massively Parallel Processing

Instant-on compute scales in seconds

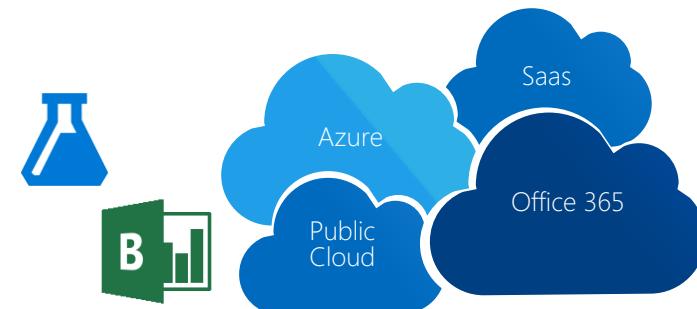
Query Relational / Non-Relational



Powered by the Cloud

Get started in minutes

Integrated with Azure ML, PowerBI & ADF



Market Leading Price & Performance



Simple billing compute & storage

Pay for what you need, when you need it with dynamic pause

SQL DW In Action

Scale X Stream Ar | Power BI | How Old | Anomaly I | Run Anon | SQL CRE

← → 🔍 ms.portal.azure.com/?r=1#resource/subscriptions/0f74ada4-f6bb-41d0-850e-e9ce

Internal Microsoft Azure > sqlcadw01 > Scale

sqlcadw01 SQL Data Warehouse

Settings Pause Open in Visual ... Open in PowerBI Scale Delete

Essentials

Resource group **sqlwdemorg** Server name **casqldw01.database.windows.net**
Location **East Asia** Status **Online**
Subscription name **Azure ML Build-Demo** Connection strings **Show database connection strings**

All settings →

Monitoring

Query Activity

TOTAL 50 ACTIVE 1 QUEUED 0

DWU Usage Storage

No available data. No available data.

Auditing

Coming soon Enable and setup Auditing

A screenshot of Microsoft Visual Studio showing a dark-themed interface. The title bar reads "vsDC91.dsdl - Microsoft Visual Studio". The menu bar includes File, Edit, View, Project, Debug, Team, SQL, Tools, Test, Architecture, Load Test, Analyze, Window, and Help. Below the menu is a toolbar with various icons. The left side features the "SQL Server Object Explorer" pane, which is expanded to show "SQL Server" and several local database connections. The main right pane displays a SQL query in a code editor:

```
select month(access_date), mobile_device_type, count(*) as numVisits  
from [HowOldNet_Datap]  
group by month(access_date), mobile_device_type
```

Scale X Stream Ar Power BI How Old Anomaly Run Anon SQL CREA

← → ⏪ | 🔒 ms.portal.azure.com/?r=1#resource/subscriptions/0f74ada4-f6bb-41d0-850e-e9ceb7

Internal Microsoft Azure > sqlcadw01 > Scale

sqlcadw01 SQL Data Warehouse

Settings Pause Open in Visual ... Open In PowerBI Scale Delete

Essentials

Resource group **sqldwdemorg**
Location **East Asia**
Subscription name **Azure ML Build-Demo**

Server name **casqldw01.database.windows.net**
Status **Online**
Connection strings [Show database connection strings](#)

All settings →

Monitoring

Query Activity

Performance 2000 DWU @\$14.00/hr

Save Discard

2000 DWU @\$14.00/hr

6 AM 12 PM 6 PM SEP 9

Settings Pause Open in Visual ... Open In PowerBI Scale Delete

Save Discard

Essentials ^

Resource group **sqlldwdemorg**

Location **East Asia**

Subscription name **Azure ML Build-Demo**

Server name **casqldw01.database.windows.net**

Status **Online**

Connection strings [Show database connection strings](#)

[All settings →](#)

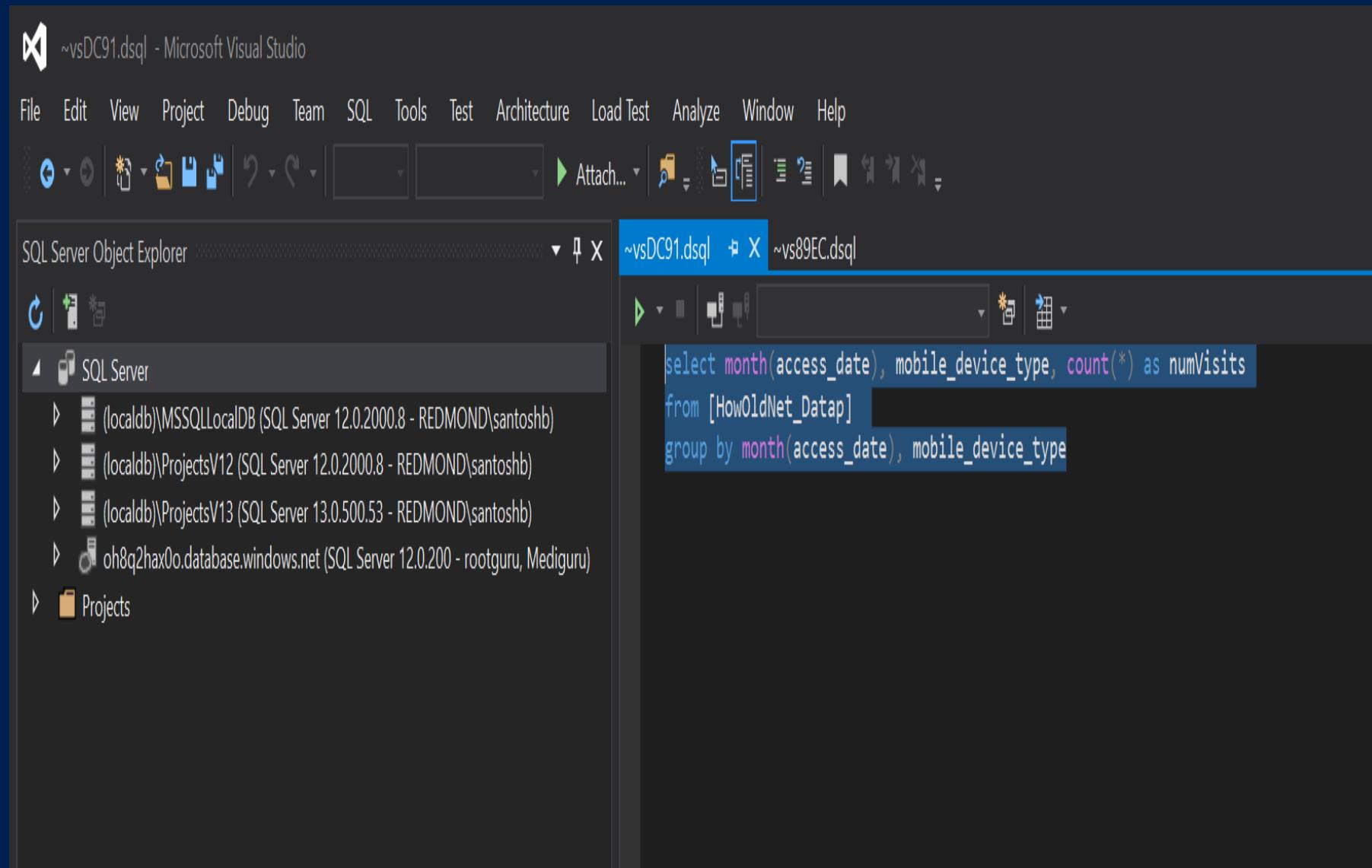
Monitoring

Query Activity

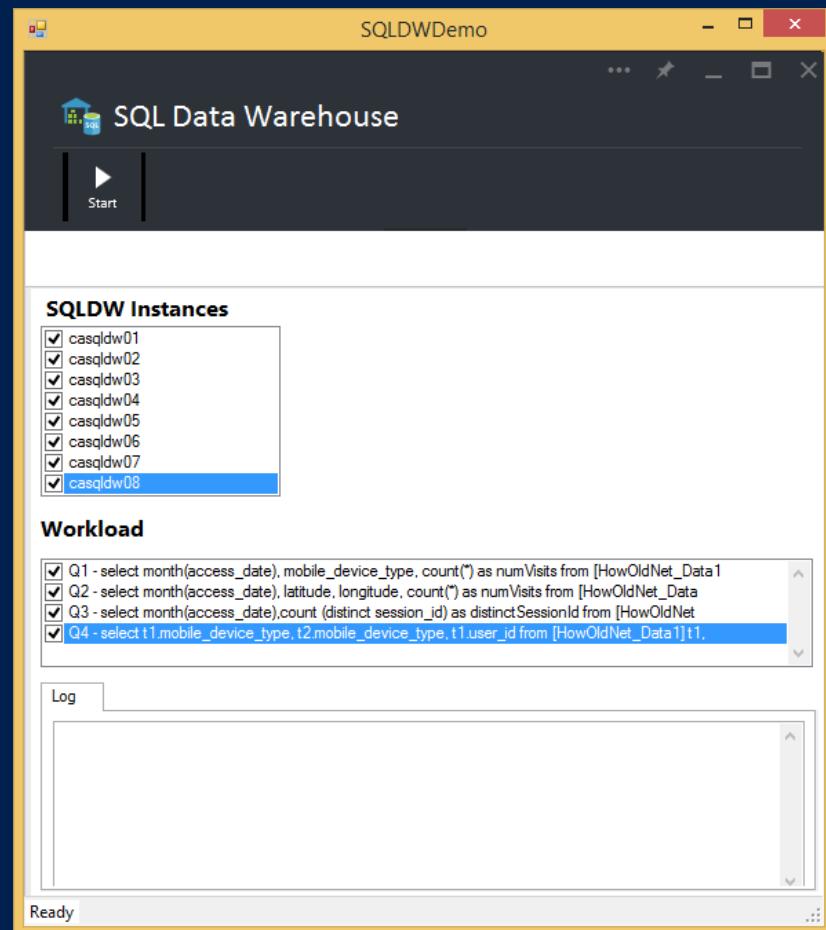
TOTAL **50** ACTIVE **1** QUEUED **0**

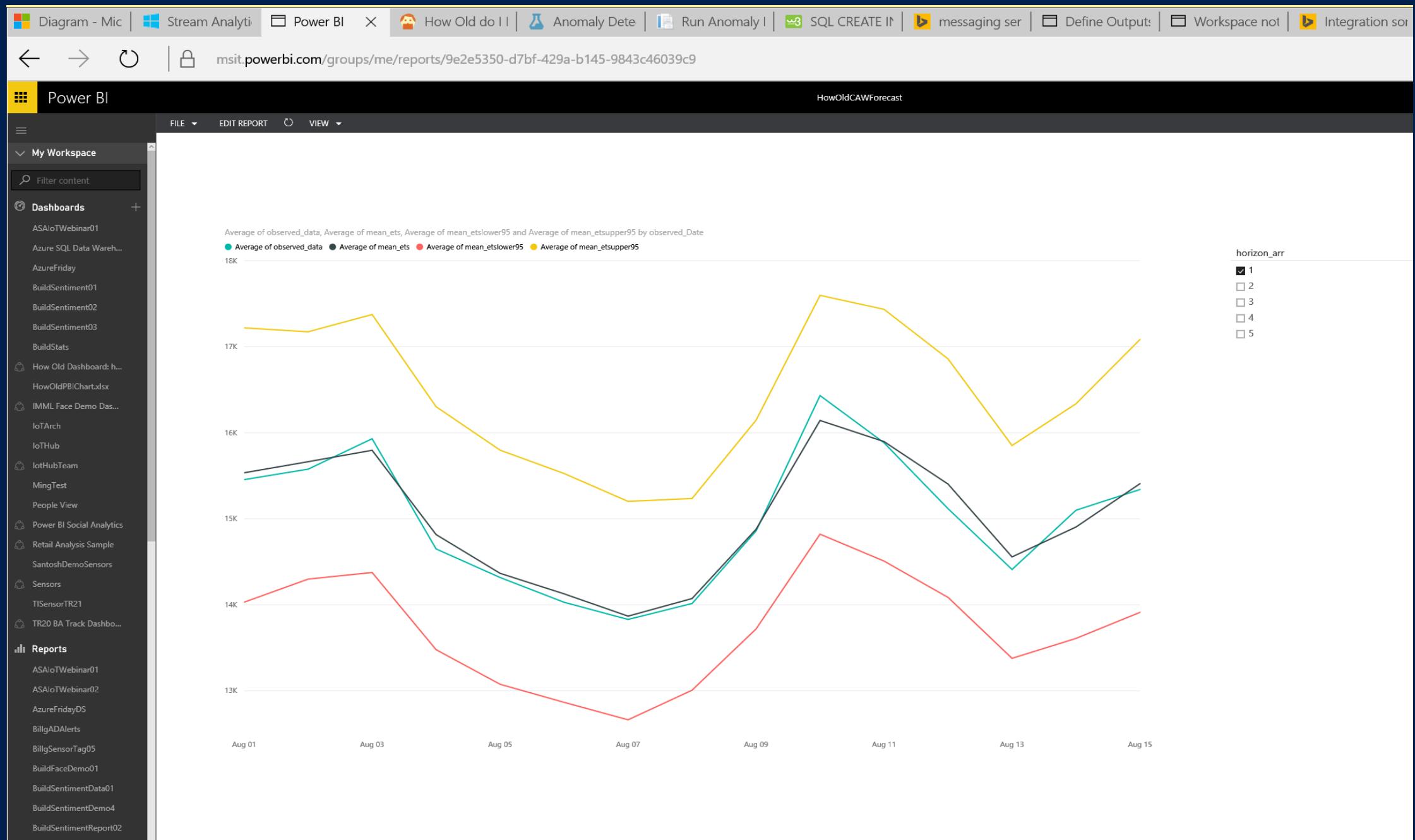
Performance 2000

2000 DWU @ \$14.00/hr



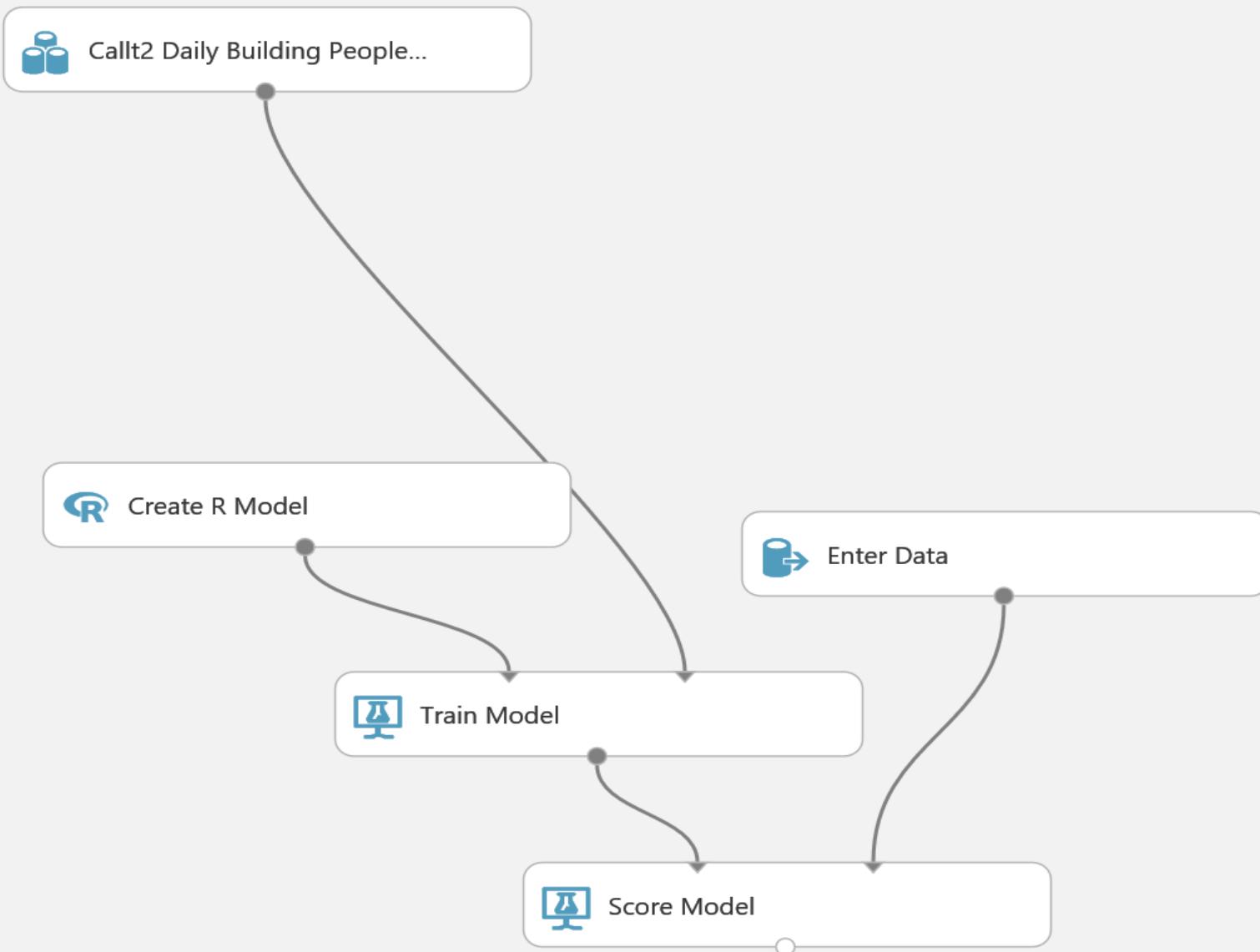
Throughput at cloud-scale





Forecasting with Create R Model Module

In dra



How-old Forecasting

Finished running ✓

```
graph TD; A[webserviceinput] --> B[Execute R Script]
```

The experiment consists of two main components: a 'webserviceinput' module at the top and an 'Execute R Script' module below it. An arrow connects the 'webserviceinput' module to the 'Execute R Script' module. The 'Execute R Script' module has a green checkmark icon next to its name.

Properties

Experiment Properties

START TIME	9/9/2015 12:24:01 AM
END TIME	9/9/2015 12:24:02 AM
STATUS CODE	Finished
STATUS DETAILS	None

[Go to web service](#)

[Prior Run](#)

Summary

Enter a few sentences describing your experiment (up to 140 characters).

Description

Enter the detailed description for your experiment.



how-old forecasting

Finished running ✓ Properties

R Script

```
1 library(forecast)
2 library(lubridate)
3
4 # Map 1-based optional input ports to variables
5 dataset_in <- maml.mapInputPort(1) # class: data.frame
6
7
8 constant <- 1
9 dataset_in <- maml.mapInputPort(1)
10 dataset_in$groupID<1
11 dataset2 = data.frame(horizon=24,lag=24,seasonality=24);
12
13
14 # dataset_in <- maml.mapInputPort(1) # class: data.frame
15 # dataset2 <- maml.mapInputPort(2) # class: data.frame
16
17 |
18 lag <- dataset2$lag
19 seasonality <- dataset2$seasonality
20
21 time_colindex <- 1
22 data_colindex <- 2
23 group_colindex <- 3
24
25
26 train_size <- 4* floor(seasonality)
27
28 horizon <- dataset2$horizon
29 all_features <- data.frame()
30 unique_groups <- unique(dataset_in[,group_colindex])
31 transform <- function(x) {
32   return (log(log(x+constant)))
33 }
34 inversetransform <- function(x,is_transform) {
35   if (is_transform == 0) {
36     return(x);
37   }
38   return (exp(exp(x))-constant)
39 }
40
41
42 for (k in 1:length(unique_groups)) {
43
```



studio.azureml.net/Home/ViewWorkspace/11af166192a14feaba807b14a07da4f1?#Workspaces/Experiments/Experiment/11af166192a14feaba807b14a07da4

Microsoft Azure Machine Learning | Home Studio Gallery PREVIEW

how-old forecasting

Finished running ✓

Search experiment items 

webserviceinput

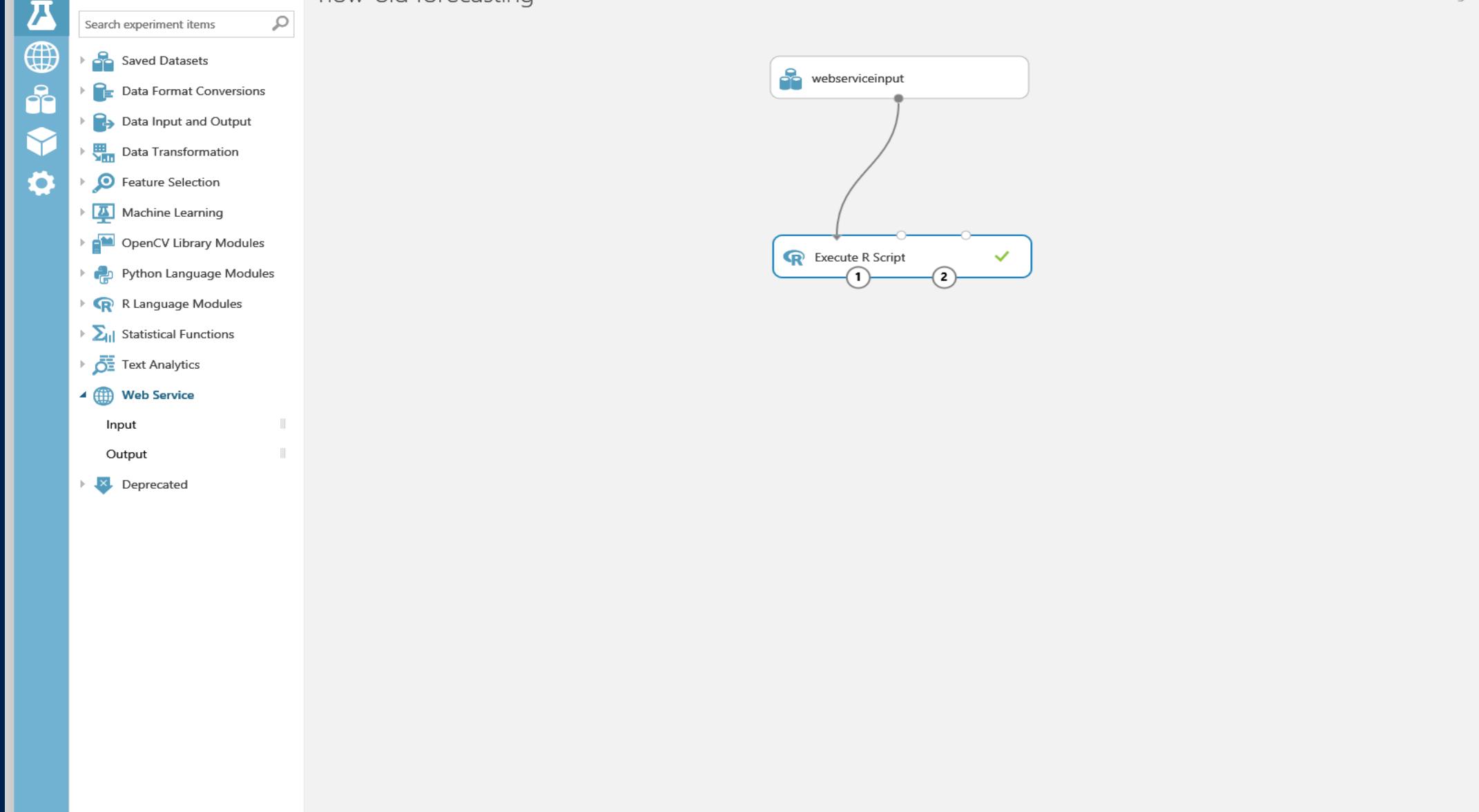
Execute R Script

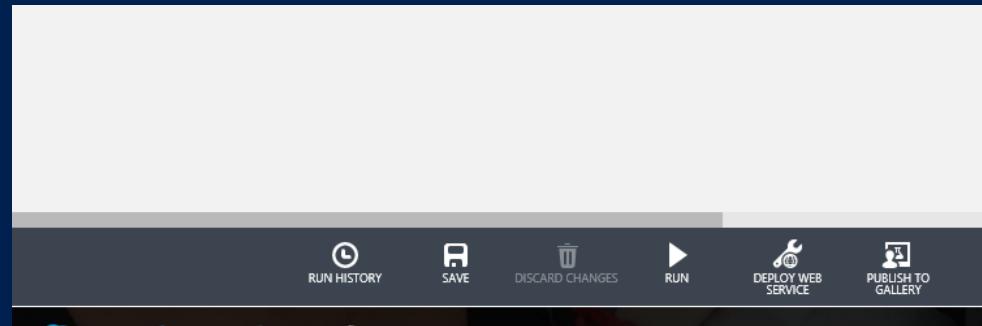
1 2 ✓

Saved Datasets
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Text Analytics

Web Service

Input
Output
Deprecated





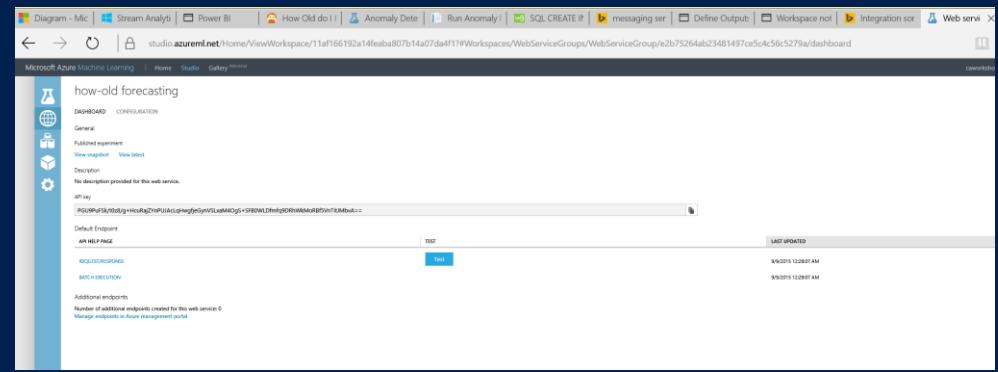


Diagram - M | Stream Anal | Power BI | How Old do | Anomaly Det | Run Anomaly | SQL CREATE | messaging sr | Define O

← → ⌂ studio.azureml.net/apihelp/workspaces/11af166192a14feaba807b14a07da4f1/webservices/e2b75264ab23481497ce5c4c56c5279a/endpoint

Request Response API Documentation for how-old forecasting

Updated: 09/09/2015 07:29

No description provided for this web service.

- [Previous version of this API](#)
- [Submit a request](#)
- [ASP Net App Template for RSS](#)
- [Sample Code](#)

OData Endpoint

OData Endpoint is not supported for this web service.

To support OData, the web service must have exactly one output and the type of that output must be DataTable. Also, default values must be present for all web service parameters.

This web service has no output.

Request

Method	Request URI	HTTP Version
POST	<code>https://ussouthcentral.services.azureml.net/workspaces/11af166192a14feaba807b14a07da4f1/services/dab3f5c758424cc5a14cc7844eae25ef/execute?api-version=2.0&details=true</code>	HTTP/1.1

*Note: You may omit the **details** parameter from the query string. This would cause **ColumnTypes** to be omitted from the output*

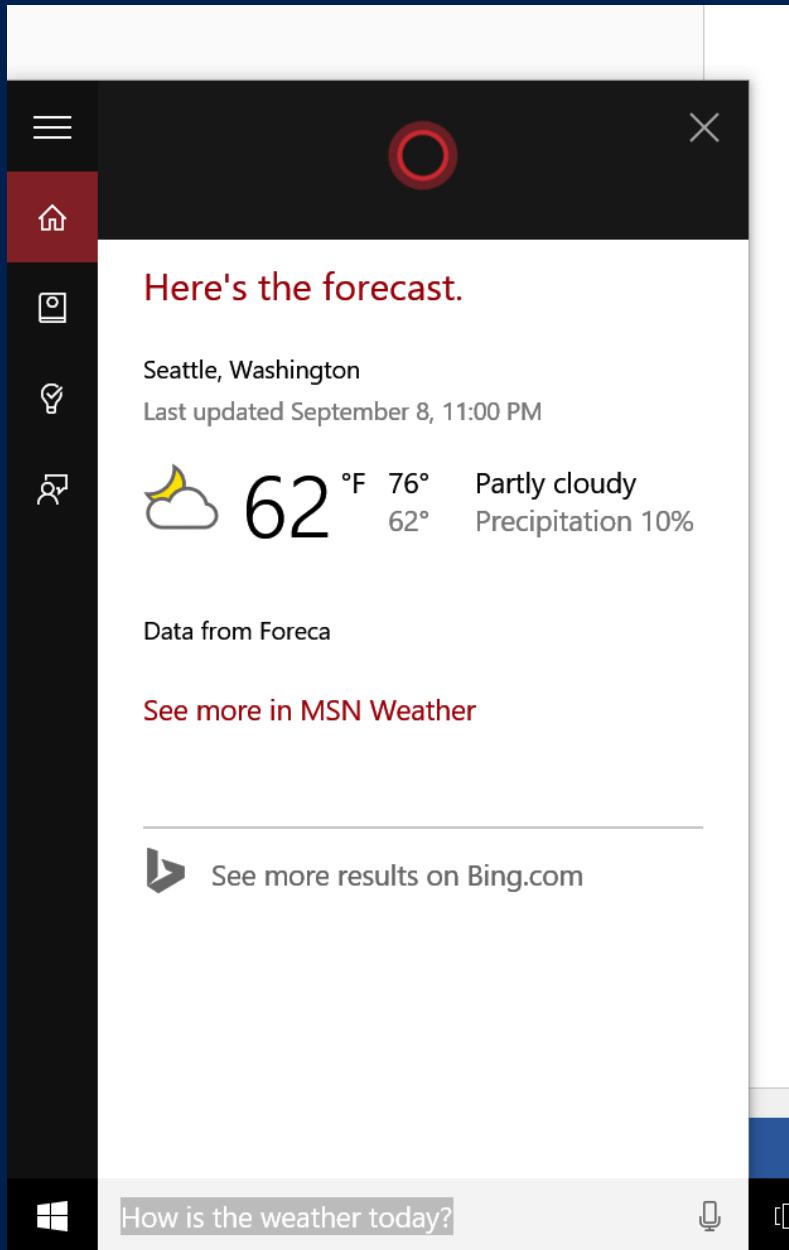
Request Headers

Request Header	Description
<code>Authorization:Bearer abc123</code>	Required. Pass the API Key here. Obtain this key from the publisher of the API.
<code>Content-Length</code>	Required. The length of the content body.
<code>Content-Type:application/json</code>	Required if the request body is sent in JSON format.
<code>Accept: application/json</code>	Optional. Use the header to receive the response in JSON format.

Request Body

Sample Request

Response



How Old do Stream Analy Diagram - M Power BI X Web service: gallery.azure HDInsight - I Data Factory Stream Analy Event Hubs - SQL Data W Machine Lea zoomit - Bin Show how o show how ol +

msit.powerbi.com/groups/me/dashboards/f0f79e40-f3db-40c6-ae05-c812381abe98

Power BI

How Old Dashboard: how-old.net

Ask a question about the data on this dashboard

Number of Users TOTAL

82M

Number of Photos TOTAL

565M

Number of Photos LAST 60 SECONDS

140

Number of Faces LAST 60 MINUTES

17K

Average Age TODAY

30.00

Faces By Browser LAST 2 MINUTES

Firefox InternetEx... Mozilla Safari Unknown

Photos Per Second

number of faces by gender

average age

number of faces by Day Of Week Name and gender

gender Female Male

number of faces by country

ASIA EUROPE

Data from How-Old Dot Net Usage
Show more details in Power BI

Faces by Gender and Age LAST 2 MINUTES

gender Female Male

Just a Kid 35 Golden Thirties 65 Retired and loving it 20 Fabulously Young 25 Prime of Youth 40 Peak of Wisdom 30 Spritely Thirties

Photos by Day

iOS

Android

Windows

MacOSX

WindowsPhone

Linux

Ubuntu

WindowsRT

show me how old usage

10:40 PM 9/9/2015

How Old do Stream Analy Diagram - M Power BI X Web service: gallery.azure HDInsight - I Data Factory Stream Analy Event Hubs - SQL Data W Machine Lea zoomit - Bin Show how o show how ol +

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Power BI

How Old Dashboard: how-old.net

Ask a question about the data on this dashboard

Number of Users
TOTAL
82M

Number of Photos
TOTAL
565M

Number of Photos
LAST 60 SECONDS
109

Number of Faces
LAST 60 MINUTES
17K

Average Age
TODAY
30.00

Faces By Browser
LAST 2 MINUTES

Photos Per Second

Faces by Gender and Age
LAST 2 MINUTES

I found the how old usage where country is Egypt.
number of faces by gender
31.7 average age
Female Male

number of faces by Day Of Week Name and gender
gender Female Male

number of faces by country
El Minya Qinā EGYPT

Data from How-Old Dot Net Usage
Show more details in Power BI

show me how old usage from Egypt

10:45 PM 9/9/2015

How Old do Stream Analy Diagram - M Power BI X Web service: gallery.azure HDInsight - I Data Factory Stream Analy Event Hubs - SQL Data W Machine Lea zoomit - Bin Show how o show how ol +

msit.powerbi.com/groups/me/dashboards/f0f79e40-f3db-40c6-ae05-c812381abe98

Power BI

How Old Dashboard: how-old.net

Share Dashboard

Ask a question about the data on this dashboard

Number of Users TOTAL 82M

Number of Photos TOTAL 565M

Number of Photos LAST 60 SECONDS 113

Number of Faces LAST 60 MINUTES 17K

Average Age TODAY 30.00

Faces By Browser LAST 2 MINUTES

Photos Per Second

Faces by Gender and Age LAST 2 MINUTES

I found the gender and number of face, where city that submissions are

number of faces by gender

Female

Male

Data from How-Old Dot Net Usage
Show more details in Power BI

number of faces from Cairo, Egypt by gender

Users by Platform

iOS

Android

Windows

MacOSX

WindowsPhone

Linux

Ubuntu

WindowsRT

10:49 PM 9/9/2015



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