SQL Server 2016

Everything built-in

Csom Gergely – Microsoft

Adat platform szakértő

Microsoft

Microsoft

SQL Server Linux

SQL Server 2016: Everything built-in

Industry leader in Mission Critical OLTP

built-in

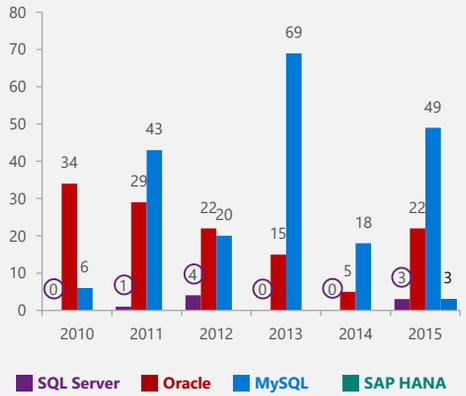
Industry leader

Most secure database

built-in

6 years in a row

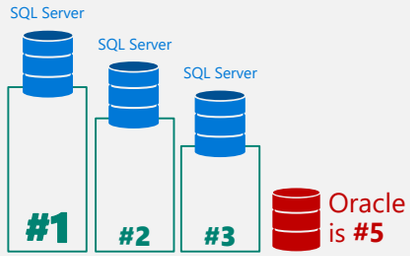
least vulnerable



Highest performing data warehouse

built-in

#1 performance

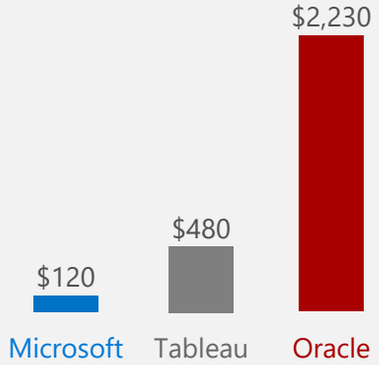


TPC-H

End-to-end mobile BI on any device

built-in

A fraction of the cost

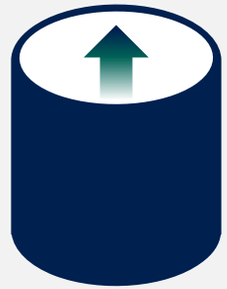


Self-service BI per user

In-database Advanced Analytics

built-in

R + in-memory



at massive scale

In-memory across all workloads

Consistent experience from on-premises to cloud

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National Institute of Standards and Technology Comprehensive Vulnerability Database update 10/2015

TPC-H 10TB non-clustered results as of 04/06/15, 5/04/15, 4/15/14 and 11/25/13, respectively. http://www.tpc.org/tpch/results/tpch_perf_results.asp?resulttype=noncluster

Microsoft is a leader for…

Magic Quadrant for Operational Database Management Systems[1]

Furthest in vision and ability to execute

As of October 2015

Magic Quadrant for Business Intelligence and Analytics Platforms[2]

Furthest in vision; leader 9 years running

As of February 2016

Magic Quadrant for Data Warehouse Database Management Solutions[3]

A leader for the fifth consecutive year

As of February 2016

[1] *Gartner "Magic Quadrant for Operational Database Management Systems," by Donald Feinberg , Merv Adrian , Nick Heudecker, Adam Ronthal, October 2015
[2] *Gartner "Magic Quadrant for Business Intelligence and Analytics Platforms," by Josh Parenteau, Rita L. Sallam, Cindi Howson, Joao Tapadinhas, Kurt Schlegel, Thomas W. Oestreich, February 4, 2016
[3] *Gartner "Magic Quadrant for Data Warehouse and Data Management Solutions for Analytics," by Roxane Edjlali and Mark Beyer, February 25, 2016

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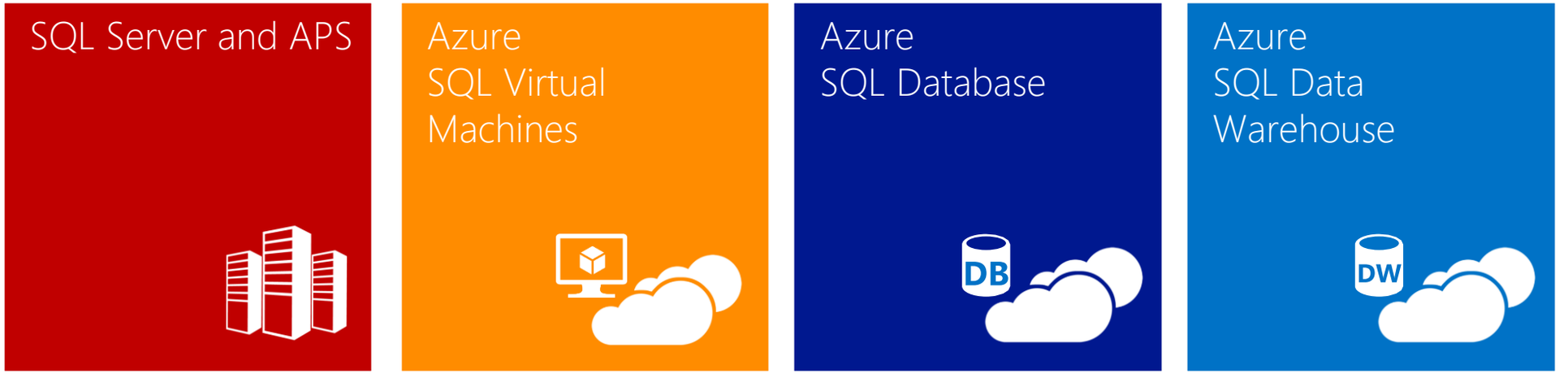
How we develop SQL



Cloud-first but not cloud-only

Use SQL Database to improve core SQL Server features and cadence

Many interesting and compelling on-premises ←→ cloud scenarios

Only Microsoft delivers

On-premises & cloud

Consistent experience is everything

SQL Server

SQL Server in Azure VM

Azure SQL Database

Analytics Platform System

Azure SQL Data Warehouse

Common tools

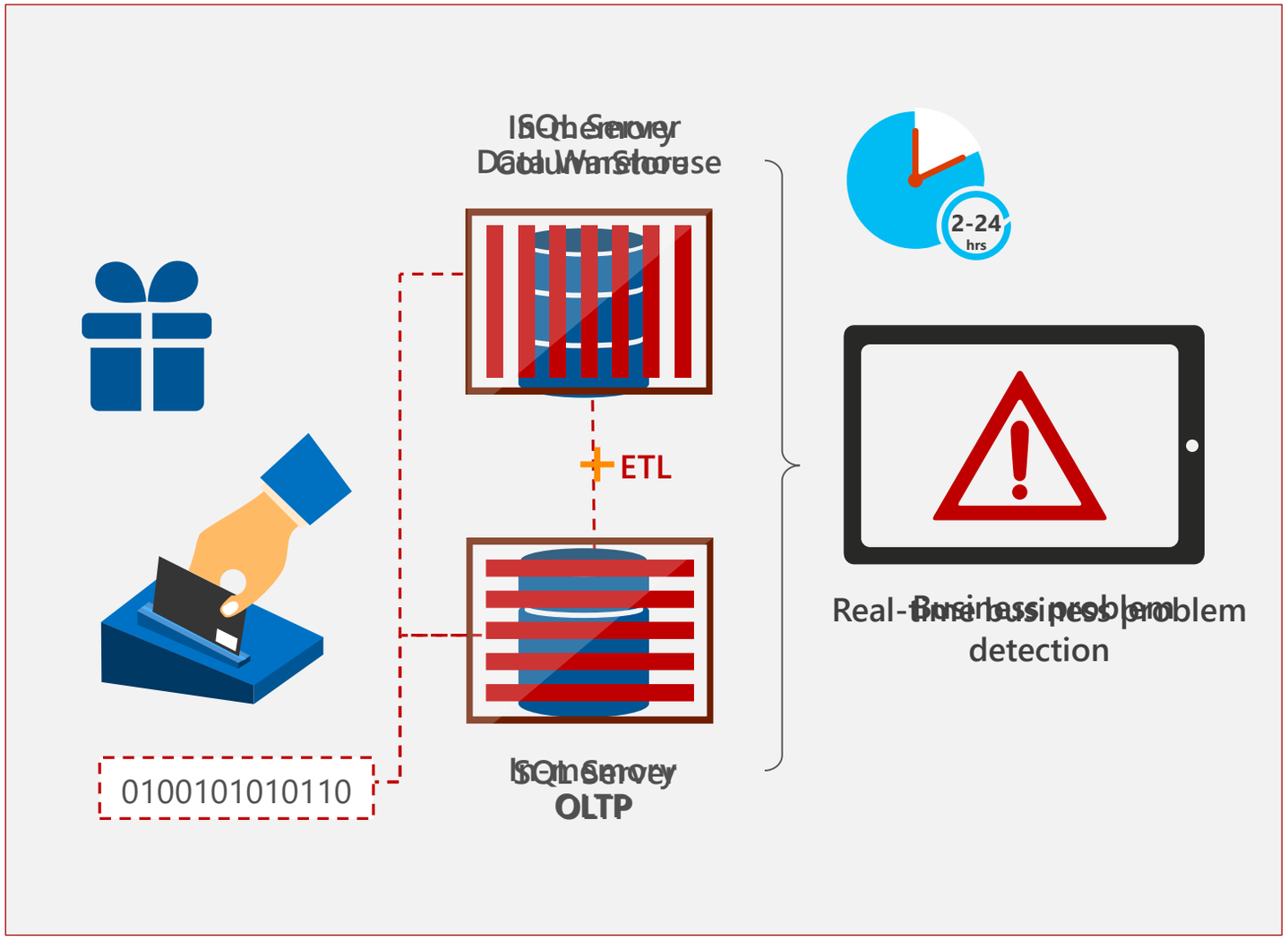
Dev ops tools | Management tools | Identity | Virtualization

Single-vendor support

- **Common tools** for development and management
- **Common T-SQL** surface area
- **Simple** cloud migration

Real-time operational analytics

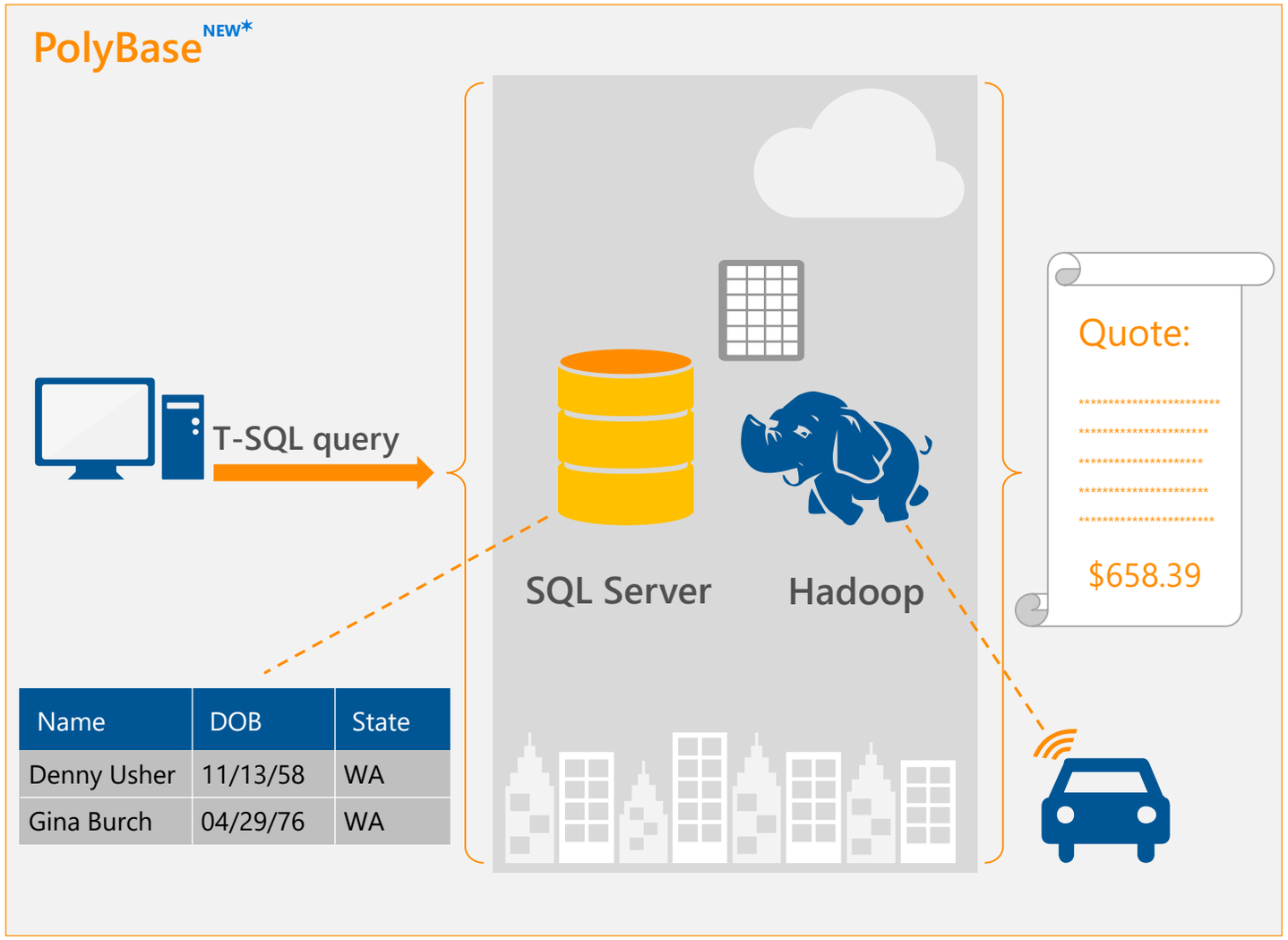
In-memory **built-in**



- Up to **30x** faster transactions with in-memory OLTP
- Queries from **minutes to seconds**
- **Real-time** NEW* operational analytics

Remove the complexity of big data

T-SQL over Hadoop



Manage structured & unstructured data

- **Simple T-SQL** NEW* to query Hadoop data (HDFS)
- **JSON support** NEW*

PolyBase use cases

Load data

Use Hadoop as an ETL tool to cleanse data before loading to data warehouse with PolyBase

Interactively query

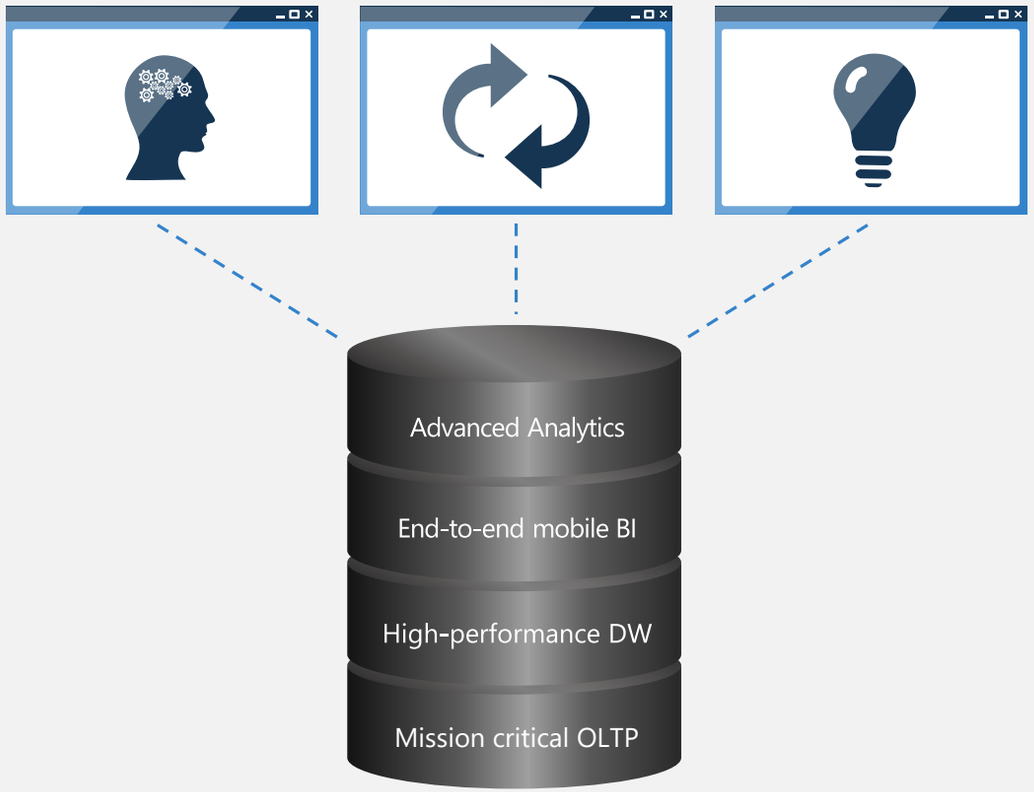
Analyze relational data with semi-structured data using split-based query processing

Age out data

Age out data to HDFS and use it as “cold” but queryable storage

In-database Advanced Analytics

Build intelligent applications with SQL Server R Services



R built-in to SQL Server

- **R built-in to your T-SQL** NEW*
- **Real-time operational analytics** NEW* without moving the data
- **Open Source R with in-memory & massive scale** NEW* - multi-threading and massive parallel processing

Revolution Analytics product integration

REVOLUTION ANALYTICS

Community

Revolution R Open

Microsoft R Open

Commercial

Revolution R Enterprise

SQL Server R Services

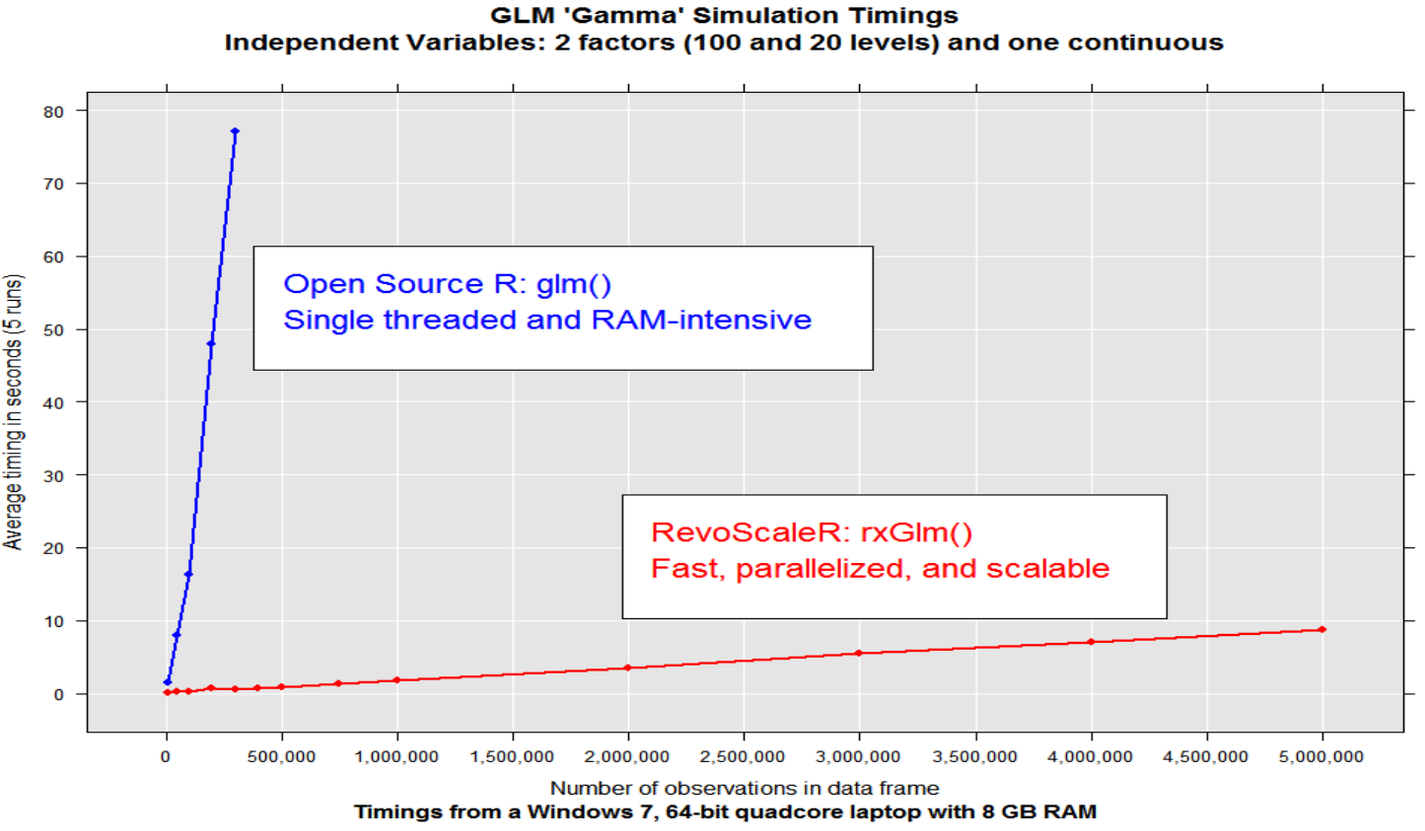
Windows

Microsoft R Server

Red Hat | SUSE | Hadoop | Teradata

ScaleR - Performance comparison

Microsoft R Server has no data size limits in relation to size of available RAM. When open source R operates on data sets that exceed RAM it will fail. In contrast Microsoft R Server scales linearly well beyond RAM limits and parallel algorithms are much faster.



File Name	Compressed File Size (MB)	No. Rows	Open Source R (secs)	Revolution R (secs)
Tiny	0.3	1,235	0.00	0.05
V. Small	0.4	12,353	0.21	0.05
Small	1.3	123,534	0.03	0.03
Medium	10.7	1,235,349	1.94	0.08
Large	104.5	12,353,496	60.69	0.42
Big (full)	12,960.0	123,534,969	Memory!	4.89
V.Big	25,919.7	247,069,938	Memory!	9.49
Huge	51,840.2	494,139,876	Memory!	18.92

- US flight data for 20 years
- Linear Regression on Arrival Delay
- Run on 4 core laptop, 16GB RAM and 500GB SSD

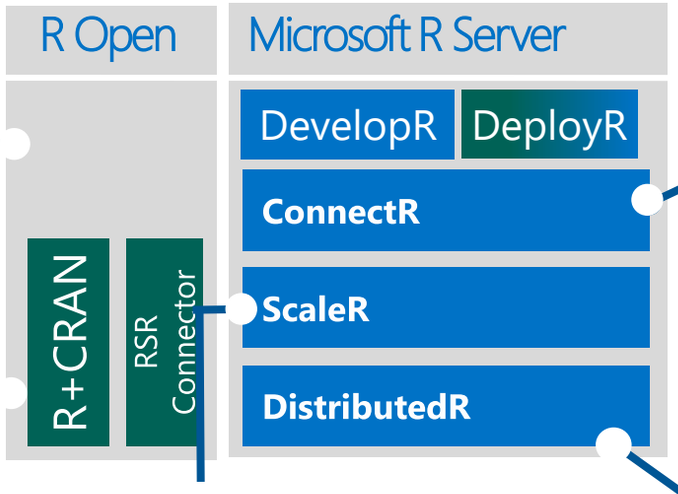
The Microsoft R Server Platform

R+CRAN

- Open source R interpreter
  - R 3.2.3
- Freely-available huge range of R algorithms
- Algorithms callable by RevoR
- Embeddable in R scripts
- 100% Compatible with existing R scripts, functions and packages

RevoR

- Performance enhanced R interpreter
- Based on open source R
- Adds high-performance math library to speed up linear algebra functions



ScaleR

- Ready-to-Use high-performance big data big analytics
- Fully-parallelized analytics
- Data prep & data distillation
- Descriptive statistics & statistical tests
- Range of predictive functions
- User tools for distributing customized R algorithms across nodes
- Wide data sets supported – thousands of variables

ConnectR

- High-speed & direct connectors

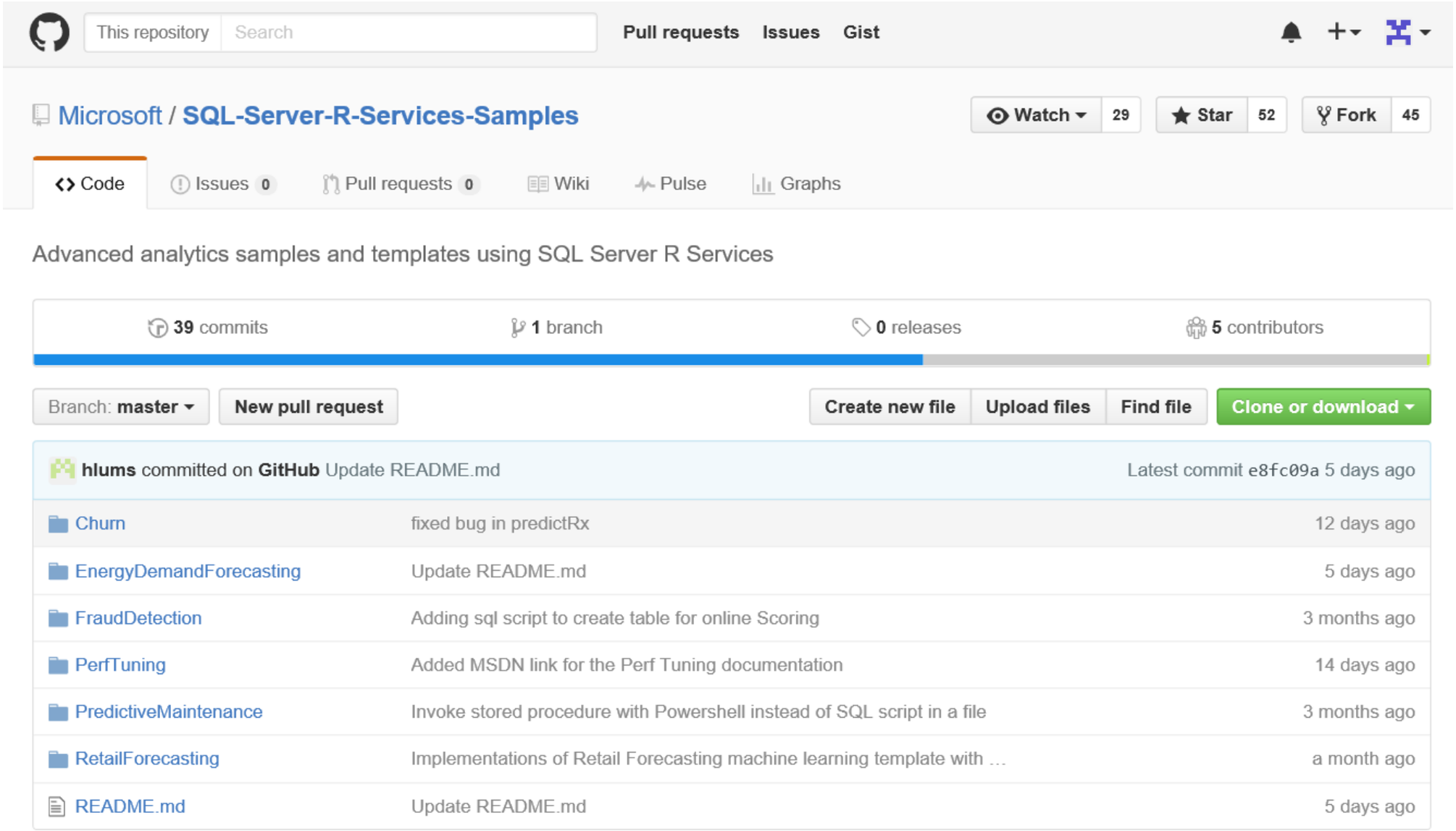
Available for:

- High-performance XDF
- SAS, SPSS, delimited & fixed format text data files
- Hadoop HDFS (text & XDF)
- Teradata Database & Aster
- EDWs and ADWs
- ODBC

DistributedR

- Distributed computing framework
- Delivers cross-platform portability

SQL Server R Servies Samples



End-to-end mobile BI on any device

Lightning fast queries & reports

- **In-memory** built-in
- **Reduce time to insight** with direct query
- **Powerful modeling** support for 50+ new DAX functions

NASDAQ

Reports in **minutes** not days

PB scale DW in SQL Server

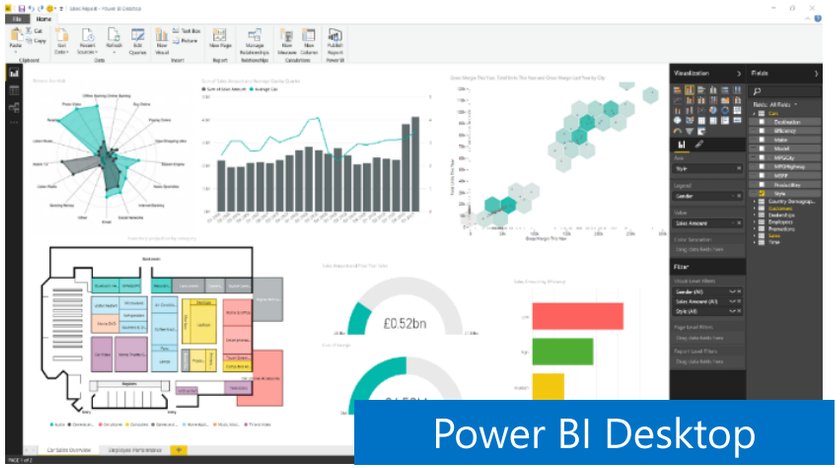
On all mobile devices

- **Mobile BI** built-in NEW*
- **Online & offline** access NEW*
- **Rich visualizations** using Power BI or enhanced Reporting Services NEW*

Windows iOS Android HTML5

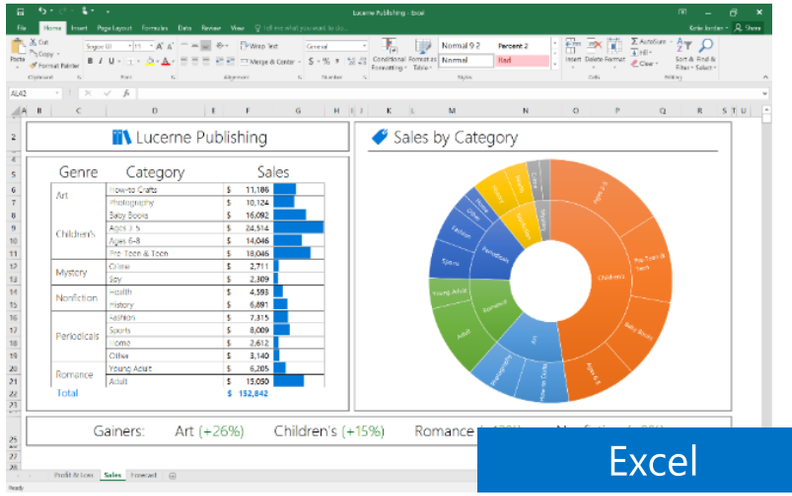
Vision for Microsoft BI Reporting

Interactive Reports



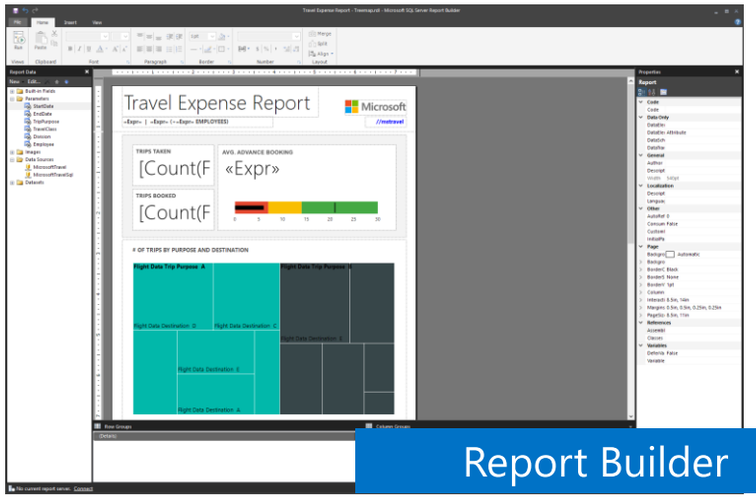
Power BI Desktop

Spreadsheets



Excel

Paginated Reports



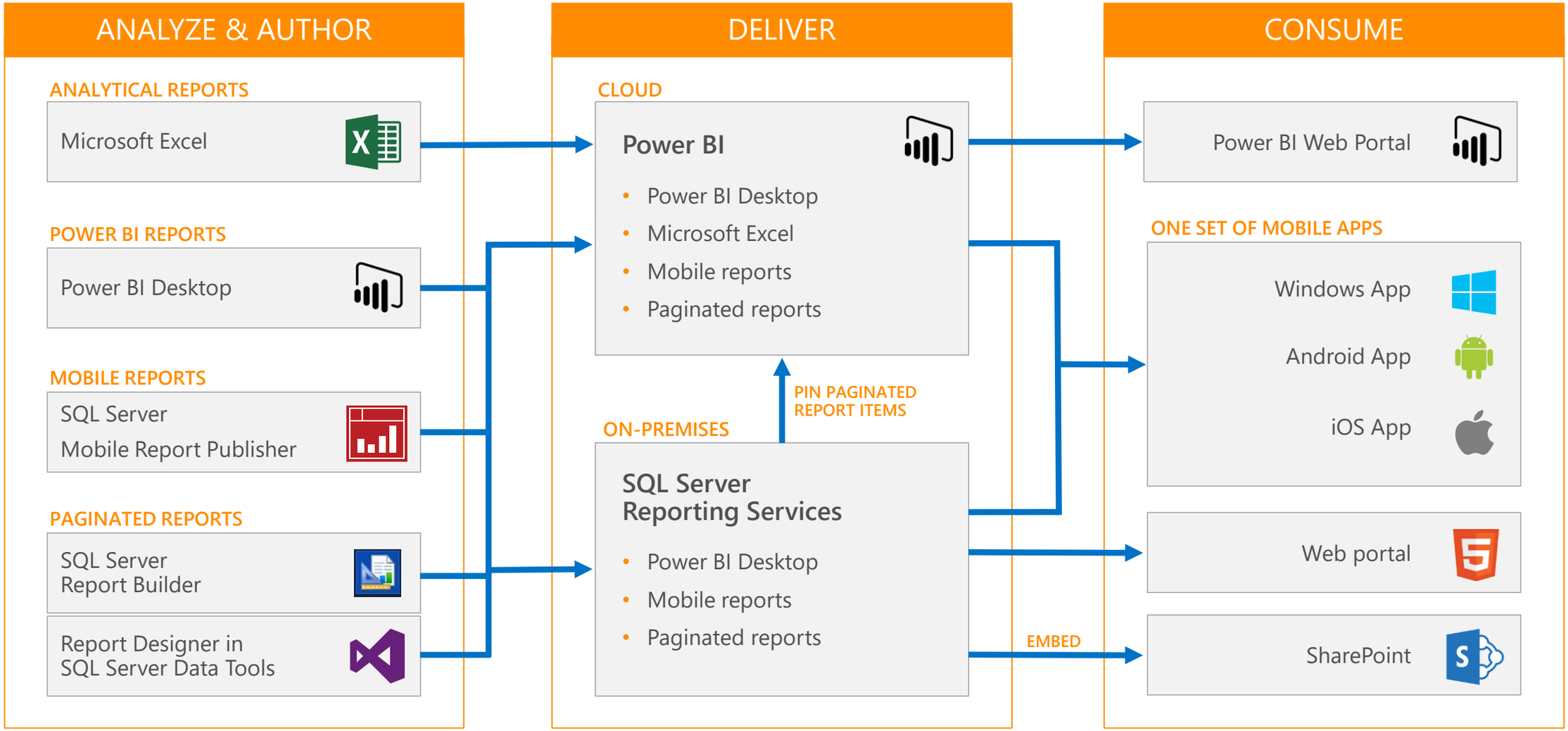
Report Builder

Mobile Reports

Datazen

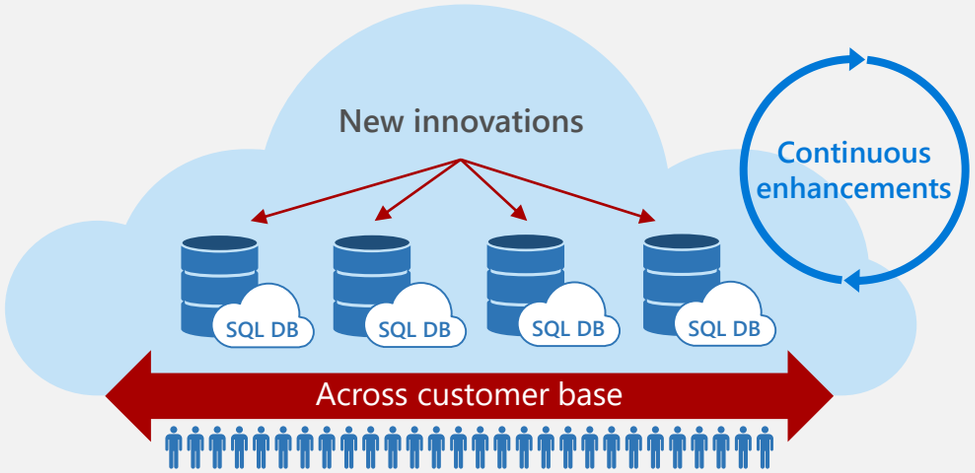
Future vision for SQL Server BI and Power BI

Beyond SQL Server 2016



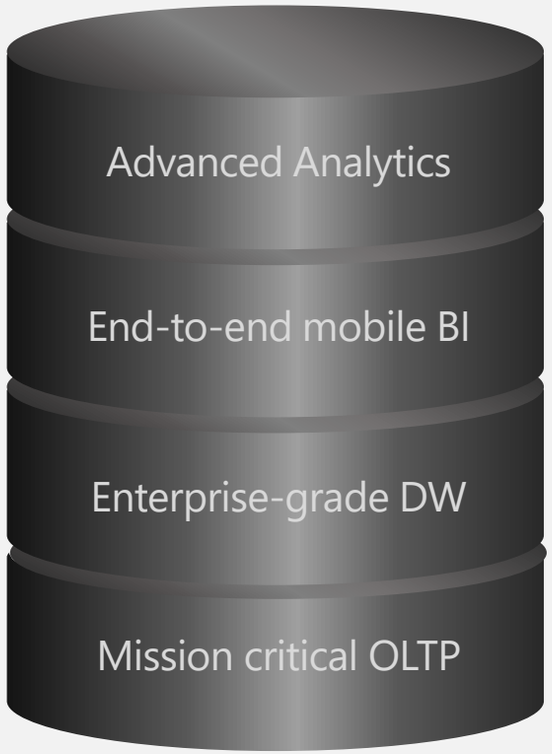
Continuous Innovation

Cloud-First Approach



- Speed
- Proven
- Agility
- Feedback

SQL Server 2016



The best SQL Server release in history

Továbblépés

- Free Ebooks:
  - Introducing Microsoft Power BI: https://blogs.msdn.microsoft.com/microsoft_press/2016/06/16/free-ebook-introducing-microsoft-power-bi/
  - Introducing Microsoft SQL Server 2016: https://info.microsoft.com/Introducing-SQL-Server-2016-eBook.html
- SQL Server Data Driven: Technical Deep Dive: https://www.youtube.com/playlist?list=PL8nfc9haGeb6T3HaGhQWvBz1AqS9d6Zv_
- EDX – Free ondemand courses:
  - Microsoft kurzusok: https://www.edx.org/school/microsoft
    - Data Science and Machine Learning Essentials:
    - Introduction to Data Analysis using Excel
    - Analyzing and Visualizing Data with Power BI
    - Implementing Real-Time Analytics with Hadoop in Azure HDInsight
    - Introduction to R Programming:
    - Introduction to Python for Data Science
    - Implementing Predictive Analytics with Hadoop in Azure HDInsight
    - Processing Big Data with Azure HDInsight
- R Tools for Visual Studio: https://www.visualstudio.com/en-us/features/rtvs-vs.aspx
- Free R Client, which can be used to connect a desktop R environment to R Server environtments: http://aka.ms/rclient
- Samples
  - SQL Server 2016 R Services Tutorials: https://msdn.microsoft.com/en-us/library/mt591993.aspx
  - R, Microsoft R Open és Microsoft R Server samples: https://github.com/Microsoft/RTVS-docs/tree/master/examples
  - MSSQL R Services Samples: https://github.com/Microsoft/SQL-Server-R-Services-Samples
  - Using Microsoft R Server on a Single Machine for Experiments With 600M Taxi Rides: https://blogs.technet.microsoft.com/machinelearning/2016/06/16/using-microsoft-r-server-on-a-single-machine-for-experiments-with-600m-taxi-rides/

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