



Microsoft Data Platform Evolution

New innovations

Paweł Potasiński

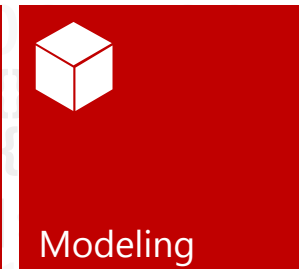
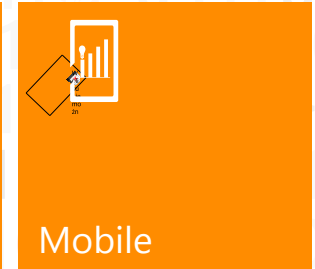
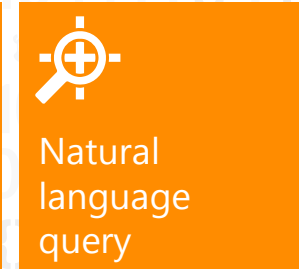
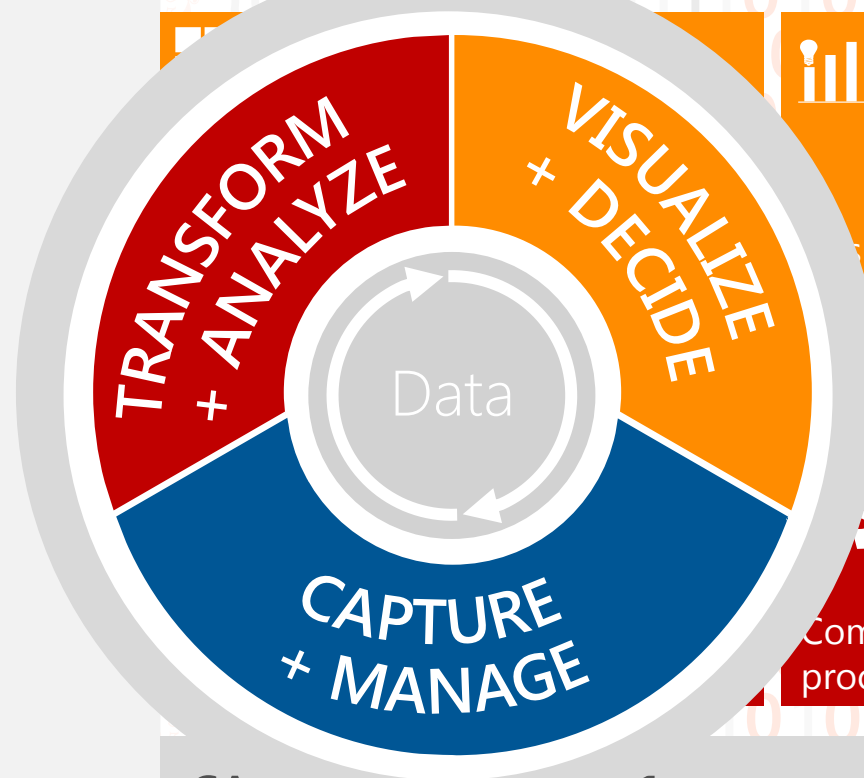
Product Manager Data Insights

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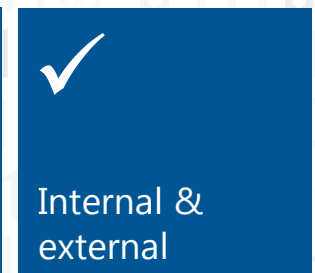
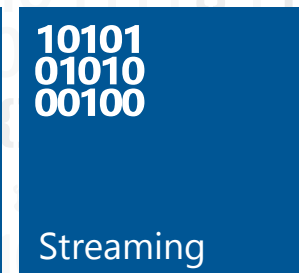
Disclaimer

- There is no public release of SQL Server vNext available at the moment.
- Some of the presented features can disappear or be a subject of substantial changes.

VISUALIZE + DECIDE



CAPTURE + MANAGE



Microsoft SQL Server

Microsoft Azure

Office

SQL Server 2016

Mission critical
performance



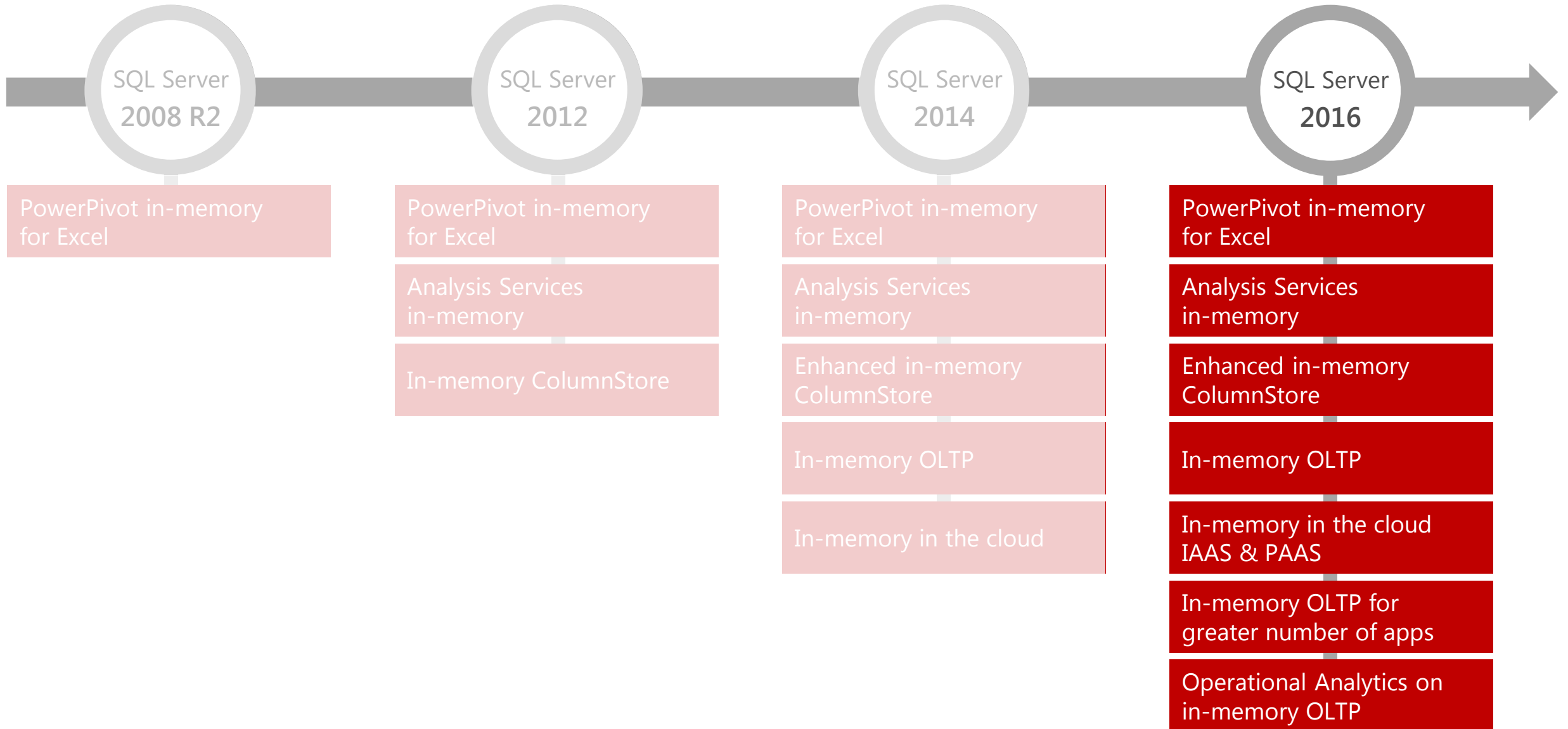
Deeper insights
across data



Hyperscale
cloud



The in-memory journey



In-memory OLTP Enhancements

- Table size 2 TB
- Foreign keys
- Check/Unique Constraints
- ALTER TABLE (offline)
- LOB support
- TDE support
- Parallelism
- OUTER JOIN, OR, NOT, UNION [ALL], DISTINCT, EXISTS, IN
- ALTER PROC / sp_recompile
- Natively-compiled UDFs (scalar)
- Nested native proc calls
- DML triggers (AFTER)
- Indexes on NULLable columns
- Non-BIN2 and non-Latin collations support
- MARS support
- SSMS Table Designer

Enhanced Columnstore Indexes

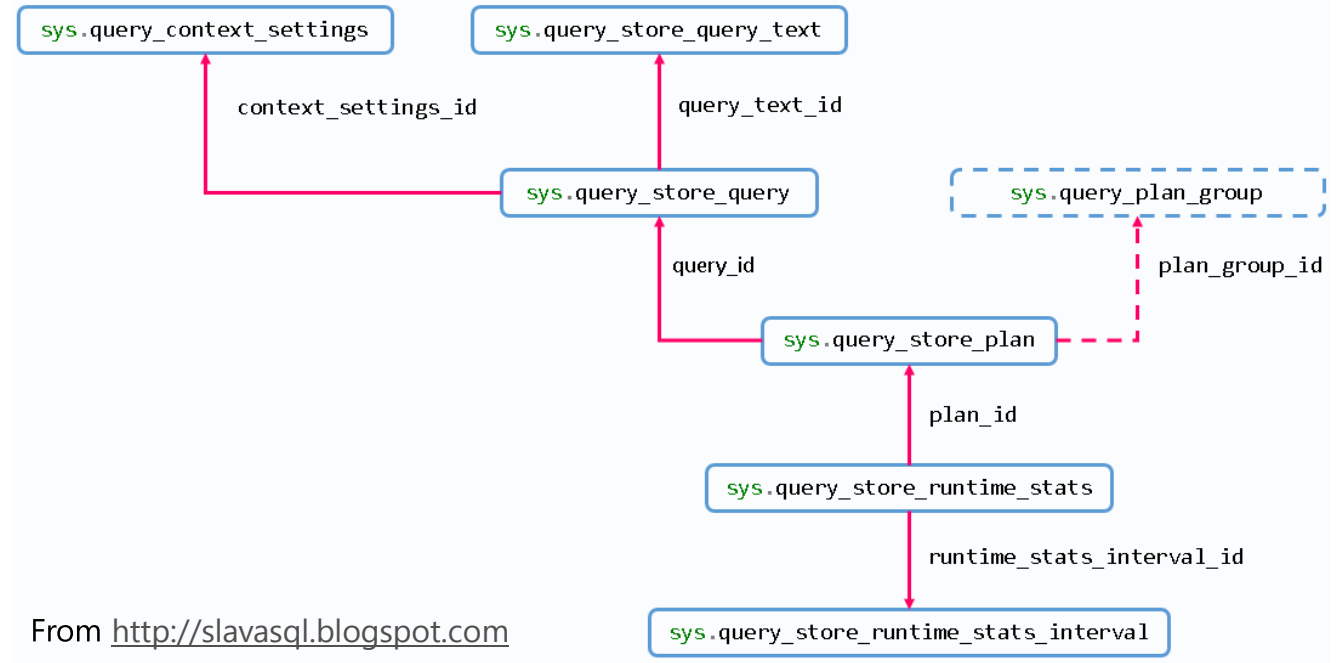
- Clustered
 - Additional NCI allowed
 - PK/FK allowed
 - AlwaysON AG – supported with readable secondary
 - Snapshot and RC Snapshot isolation levels supported
- Nonclustered
 - Updateable
 - Can be filtered
- New query execution strategies
- Online REORGANIZE removes deleted rows
- New DMVs, XE and PerfMon counters
- Parallel Insert
- Single thread batch mode execution
- Batch anti-semi-join
- Multiple count DISTINCT
- Window aggregates
- Sort

AlwaysOn Enhancements

- AlwaysOn AG in Standard SKU
- Up to 3 synchronous failover targets
- Round robin load balancing for readable secondaries
- Optional setting to fail over based on database failure
- Support for distributed transactions
- Lower CPU usage and higher performance during log transport

Query Data Store

- 1.Enable Query Store.
- 2.Use a set of DMV's.
- 3.Find the bottleneck.
- 4.Find the fastest plan.
- 5.Mark fastest plan to be used for the query.



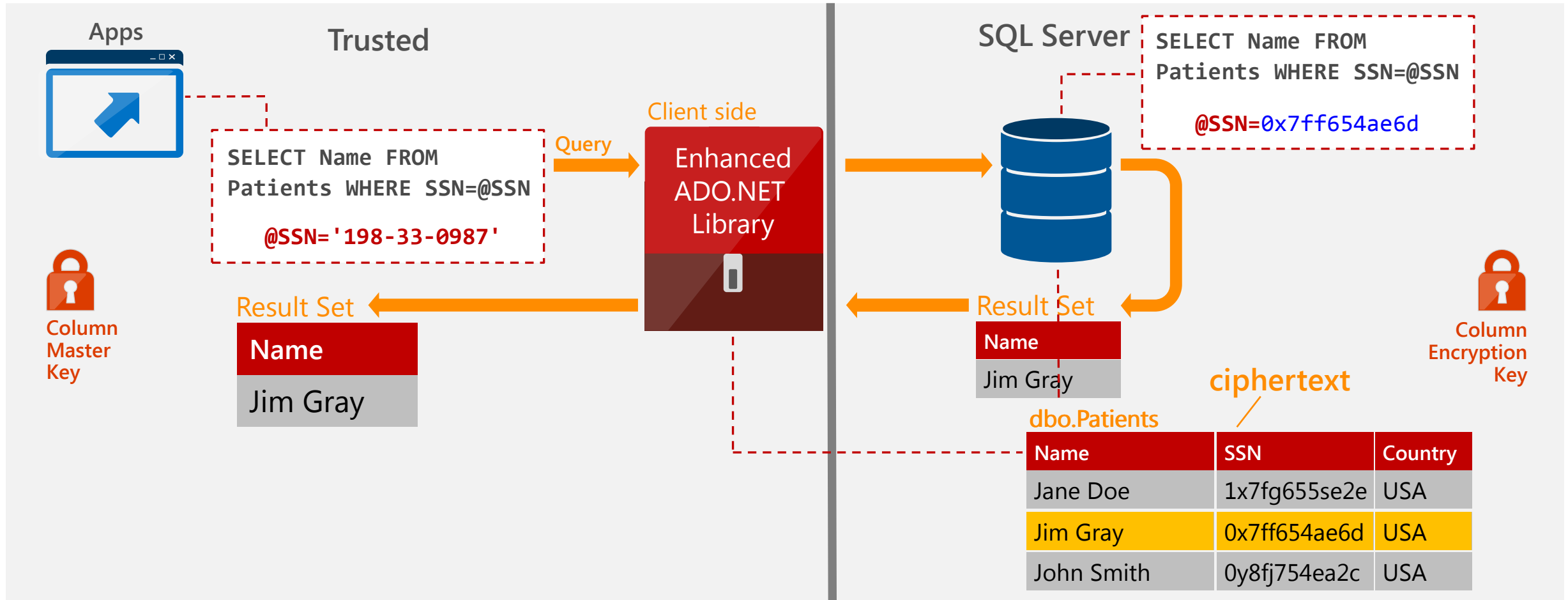
```
ALTER DATABASE MyTestDB
SET QUERY_STORE (interval_length_minutes = 1);

ALTER DATABASE MyTestDB SET QUERY_STORE = ON;

EXEC sp_query_store_force_plan 1, 1;
```

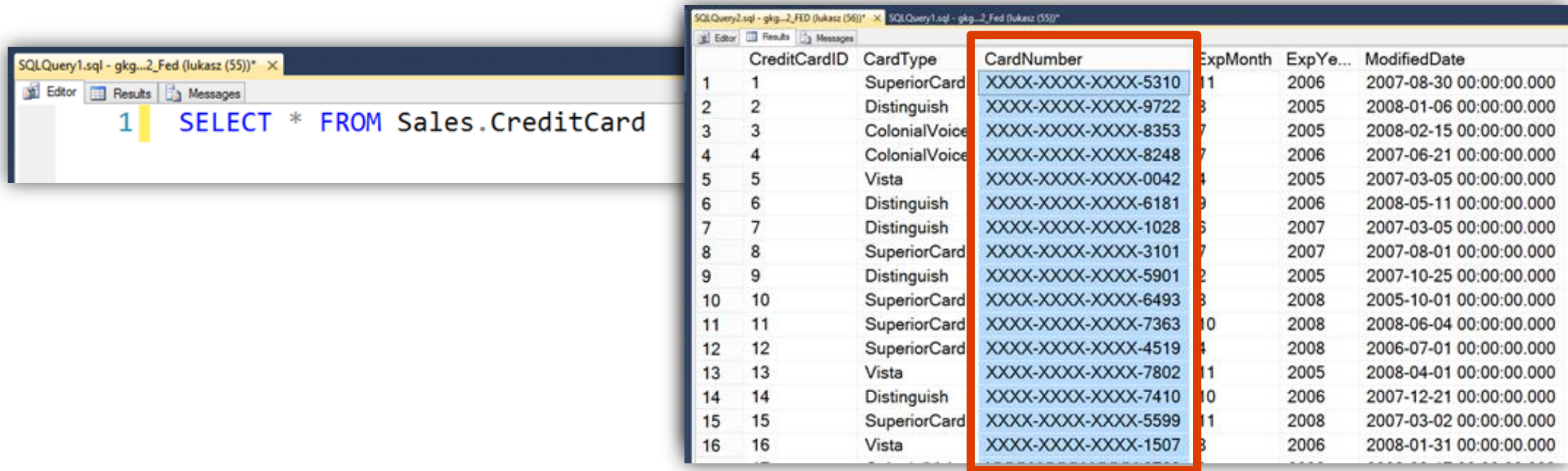
Always Encrypted

Help protect data at rest and in motion, on-premises & cloud



Dynamic Data Masking

- Real-time obfuscation of data
- Complimentary to encryption



The screenshot displays two windows from SQL Server Enterprise Manager. The left window shows a query in the 'Editor' tab: `1 SELECT * FROM Sales.CreditCard`. The right window shows the 'Results' tab with a table of 16 rows. The 'CardNumber' column is masked with 'XXXX-XXXX-XXXX-XXXX' followed by the last four digits. A red rectangle highlights the 'CardNumber' column.

	CreditCardID	CardType	CardNumber	ExpMonth	ExpYe...	ModifiedDate
1	1	SuperiorCard	XXXX-XXXX-XXXX-5310	11	2006	2007-08-30 00:00:00.000
2	2	Distinguish	XXXX-XXXX-XXXX-9722	8	2005	2008-01-06 00:00:00.000
3	3	ColonialVoice	XXXX-XXXX-XXXX-8353	7	2005	2008-02-15 00:00:00.000
4	4	ColonialVoice	XXXX-XXXX-XXXX-8248	7	2006	2007-06-21 00:00:00.000
5	5	Vista	XXXX-XXXX-XXXX-0042	4	2005	2007-03-05 00:00:00.000
6	6	Distinguish	XXXX-XXXX-XXXX-6181	9	2006	2008-05-11 00:00:00.000
7	7	Distinguish	XXXX-XXXX-XXXX-1028	6	2007	2007-03-05 00:00:00.000
8	8	SuperiorCard	XXXX-XXXX-XXXX-3101	7	2007	2007-08-01 00:00:00.000
9	9	Distinguish	XXXX-XXXX-XXXX-5901	2	2005	2007-10-25 00:00:00.000
10	10	SuperiorCard	XXXX-XXXX-XXXX-6493	8	2008	2005-10-01 00:00:00.000
11	11	SuperiorCard	XXXX-XXXX-XXXX-7363	10	2008	2008-06-04 00:00:00.000
12	12	SuperiorCard	XXXX-XXXX-XXXX-4519	4	2008	2006-07-01 00:00:00.000
13	13	Vista	XXXX-XXXX-XXXX-7802	11	2005	2008-04-01 00:00:00.000
14	14	Distinguish	XXXX-XXXX-XXXX-7410	10	2006	2007-12-21 00:00:00.000
15	15	SuperiorCard	XXXX-XXXX-XXXX-5599	11	2008	2007-03-02 00:00:00.000
16	16	Vista	XXXX-XXXX-XXXX-1507	8	2006	2008-01-31 00:00:00.000

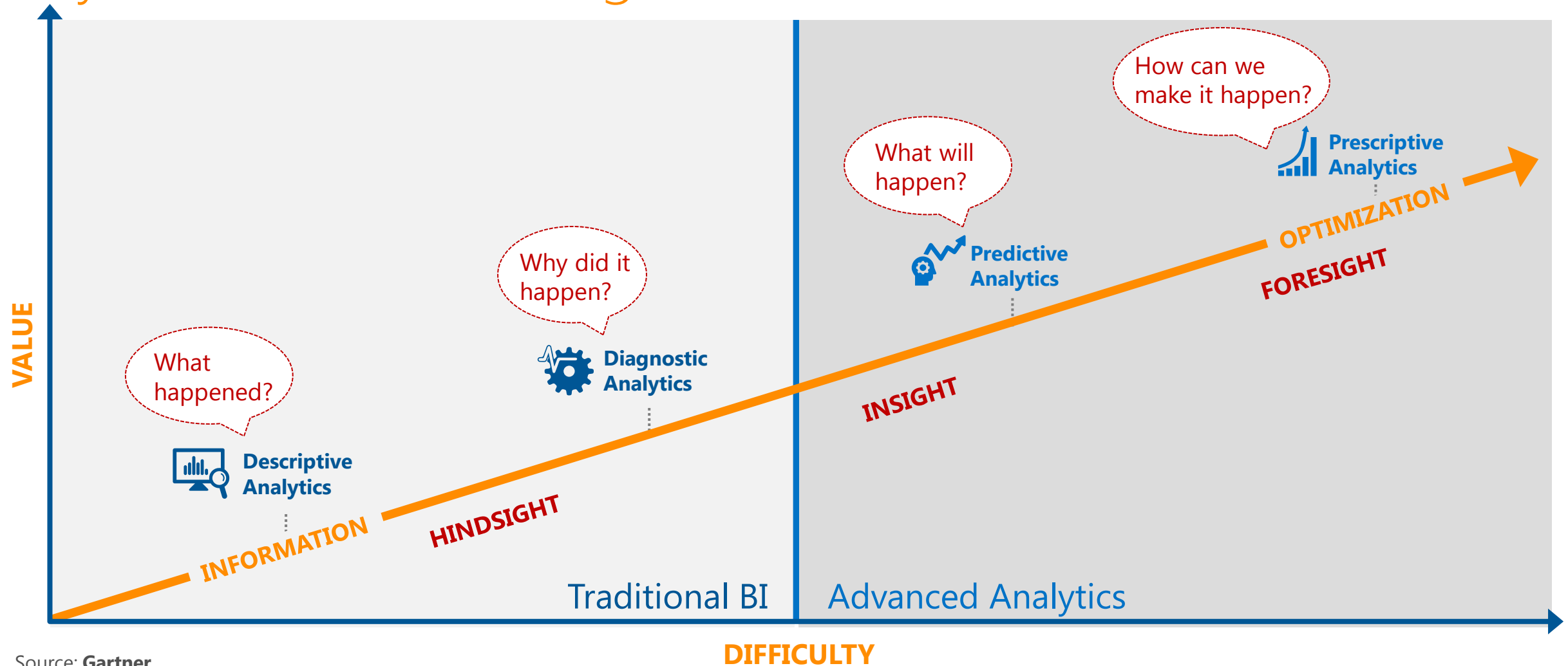
From <http://blog.sqlexpert.pl/2015/04/09/dynamic-data-masking-w-sql-azure/>

Mission critical performance

Performance	Security	Availability	Scalability
Operational analytics	Always Encrypted	Enhanced AlwaysOn <ul style="list-style-type: none">• 3 synchronous replicas for auto failover across domains• Round robin load balancing of replicas• DTC for transactional integrity across database instances with AlwaysOn	Enhanced database caching
In-memory OLTP for more applications	Row Level Security		No 16 core and 128GB of RAM restrictions in Standard Edition
Query data store	Dynamic Data Masking		
Native JSON		Enhanced online operations	Support for Windows Server 2016 <ul style="list-style-type: none">• 12 TB memory support
Temporal database support			

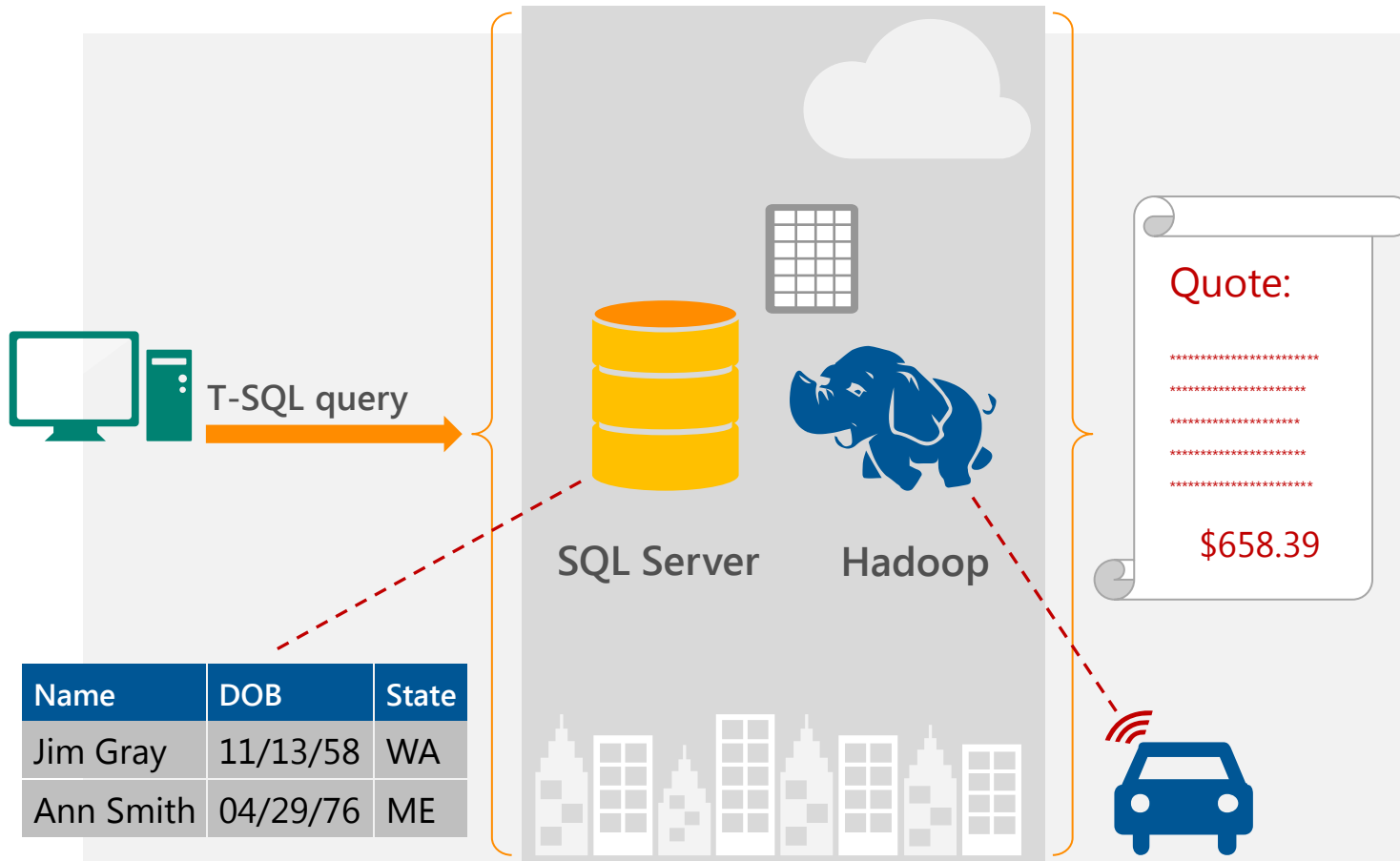
Advanced Analytics

Beyond business intelligence



PolyBase

Query relational and non-relational data with T-SQL



Capability

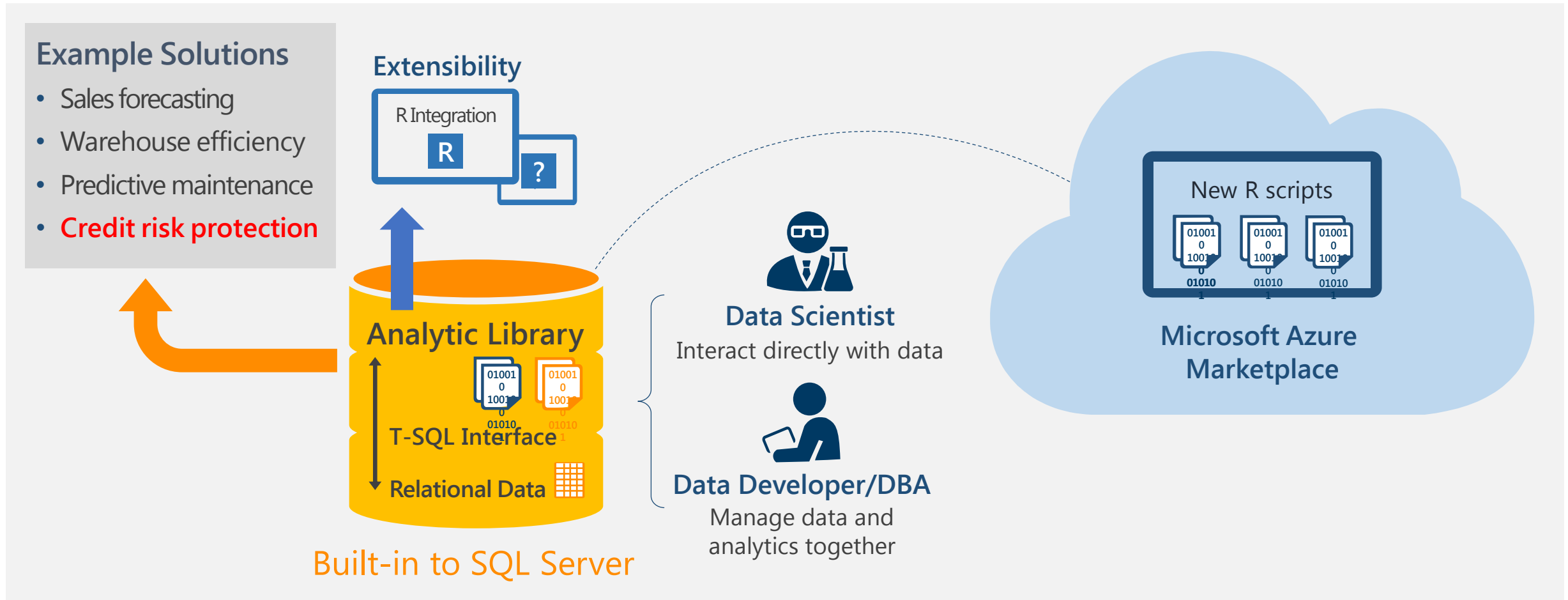
T-SQL for querying relational and non-relational data across SQL Server and Hadoop

Benefits

- ➔ New business insights across your data lake
- ➔ Leverage existing skillsets and BI tools
- ➔ Faster time to insights and simplified ETL process

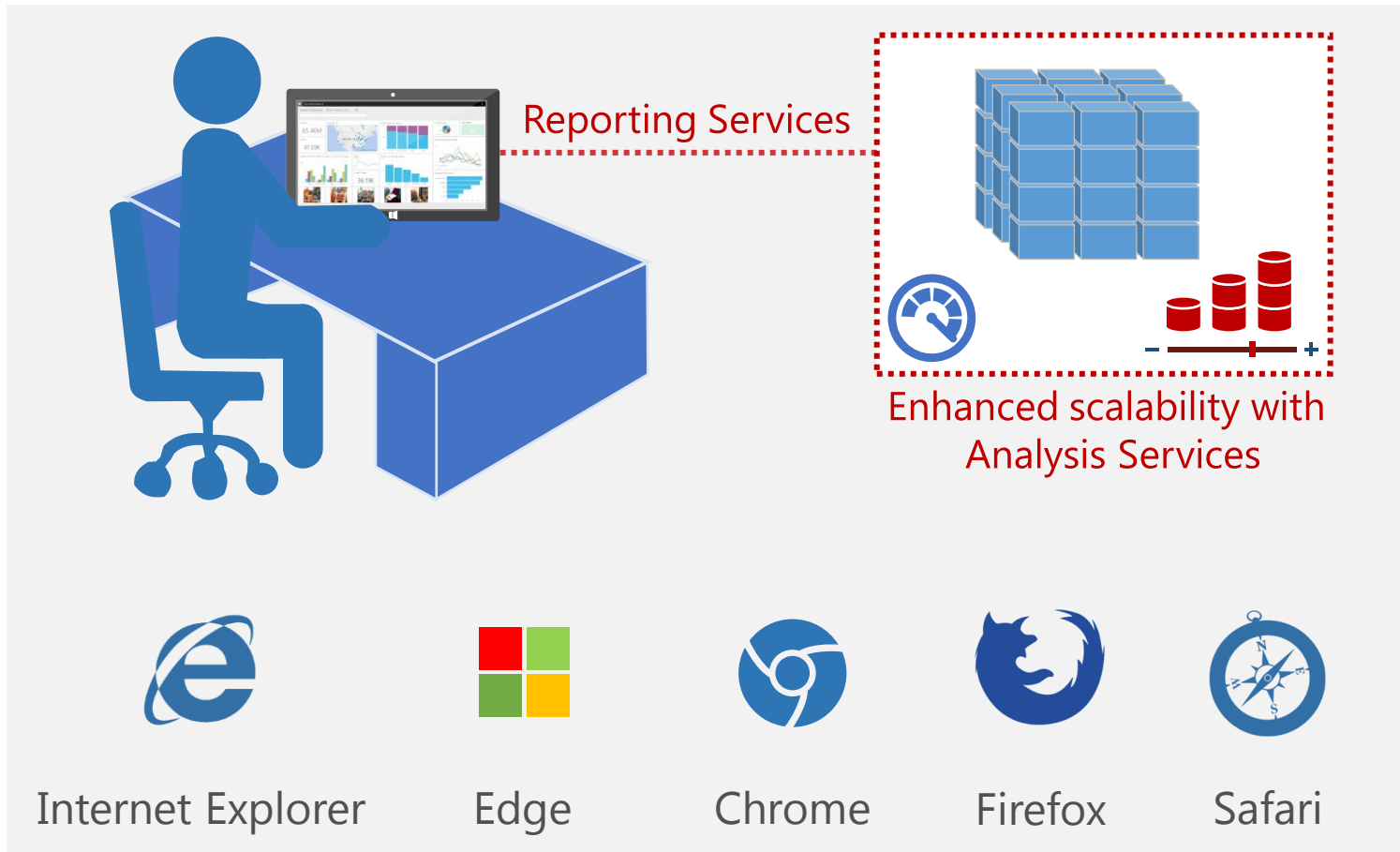
Built-in advanced analytics

In-database analytics at massive scale



Enhanced Analysis & Reporting Services

Scalable on-premises BI solutions & new modern reports



Capability

Direct query performance improvements and greater scalability in SSAS

Rich visualizations with reporting services and ability to view in PowerBI

Benefits

- ➔ Better performance and higher scale
- ➔ Rich visualizations on-premises & cloud
- ➔ No application changes

Rich visualizations on mobile devices

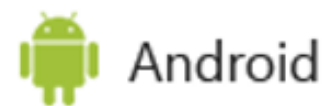


Capabilities

Business insights through rich visualizations on any device. Native apps for Windows, iOS and Android

Benefits

- ➔ Access your data from anywhere
- ➔ Touch optimized data exploration and perfect scaling to any screen form-factor
- ➔ Collaborate with colleagues on the go



Deeper insights across data

Access any data

PolyBase

Power Query for analytics and reporting

Enhanced SSIS

- Designer support for previous SSIS versions
- Support for Power Query

Scale and manage

Enterprise-grade Analysis Services

New single SSDT in Visual Studio 2015

Enhanced MDS

- Excel add-in 15x faster
- More granular security roles
- Archival options for transaction logs
- Reuse entities across models

Powerful insights

Built-in advanced analytics

Business insights through rich visualizations on mobile devices

Enhanced Reporting Services

Stretch SQL Server into Azure

Securely stretch cold tables to Azure with remote query processing

Always Encrypted

Order history

Name	Date	Item
0x21ba906fdb52	1ba906fd	2ba906f
0x19ca706fbd9a	5re316rl	1da813t
1x59cm676rfd8b		
2y36cg776rgd5b		
1t64ce87r6pd7d		
0y16cj676r6fd3e		
3x47cr876r6fd9a	2bt200cf	1ca906f

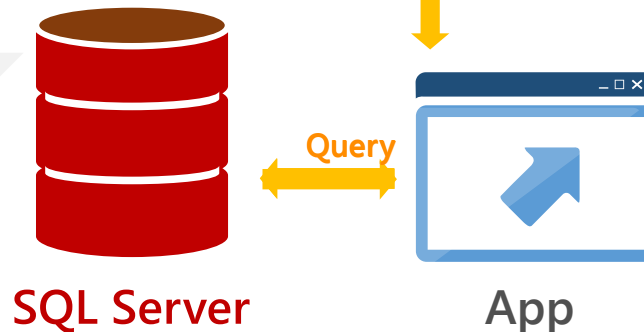
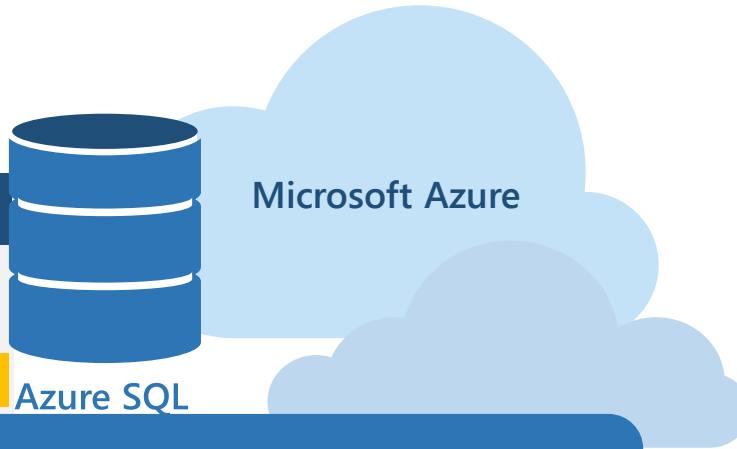
Order history

Name	
0x21ba906fdb52	
0x19ca706fbd9a	
1x59cm676rfd8b	
2y36cg776rgd5b	

- ☐ Customer data
- ☐ Product data
- ☒ Order History

**ALTER DATABASE MyERPDatabase SET
STRETCH ON;**

**ALTER TABLE dbo.[Order History] ENABLE
STRETCH;**
Stretch to cloud



Capability

Stretch cold database tables from on-premises SQL Server Databases to Azure with remote query processing

Benefits

- ➔ Cost effective historical data
- ➔ Entire table is online and remains queryable from on-premises apps
- ➔ Transparent to applications
- ➔ Supports **Always Encrypted** and **Row Level Security**

Hyperscale cloud

Hybrid solutions

Stretch tables into Azure

Power BI with on-premises data

Hybrid scenarios with SSIS

Enhanced backup to Azure

Simplicity

Easy migration of on-premises SQL Server

Simplified Add Azure Replica Wizard

Consistency

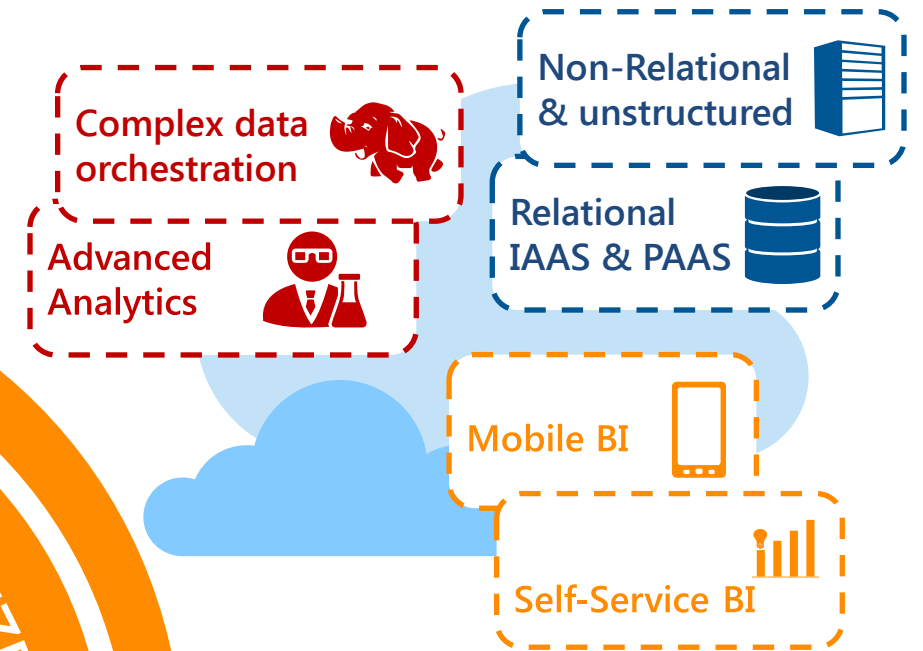
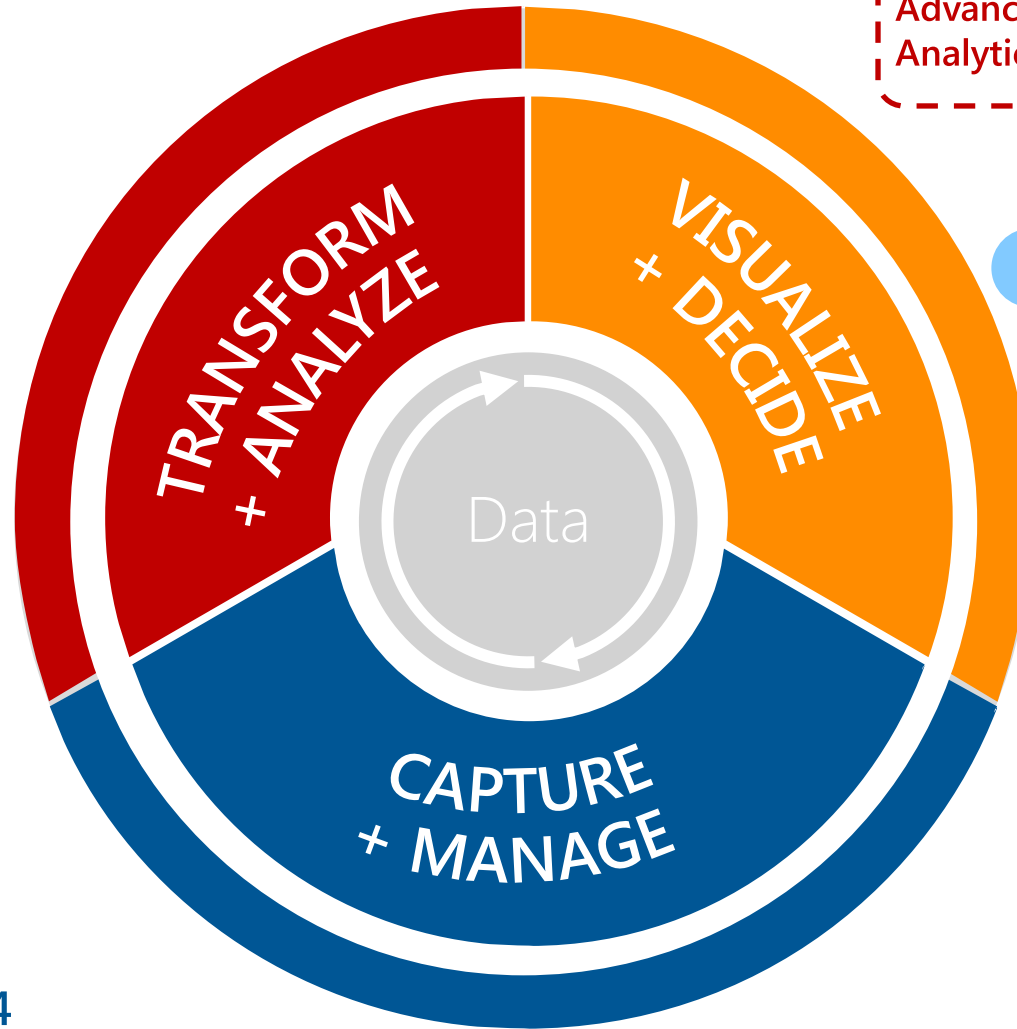
Common development, management and identity tools

Consistent experience from on-premises to Azure

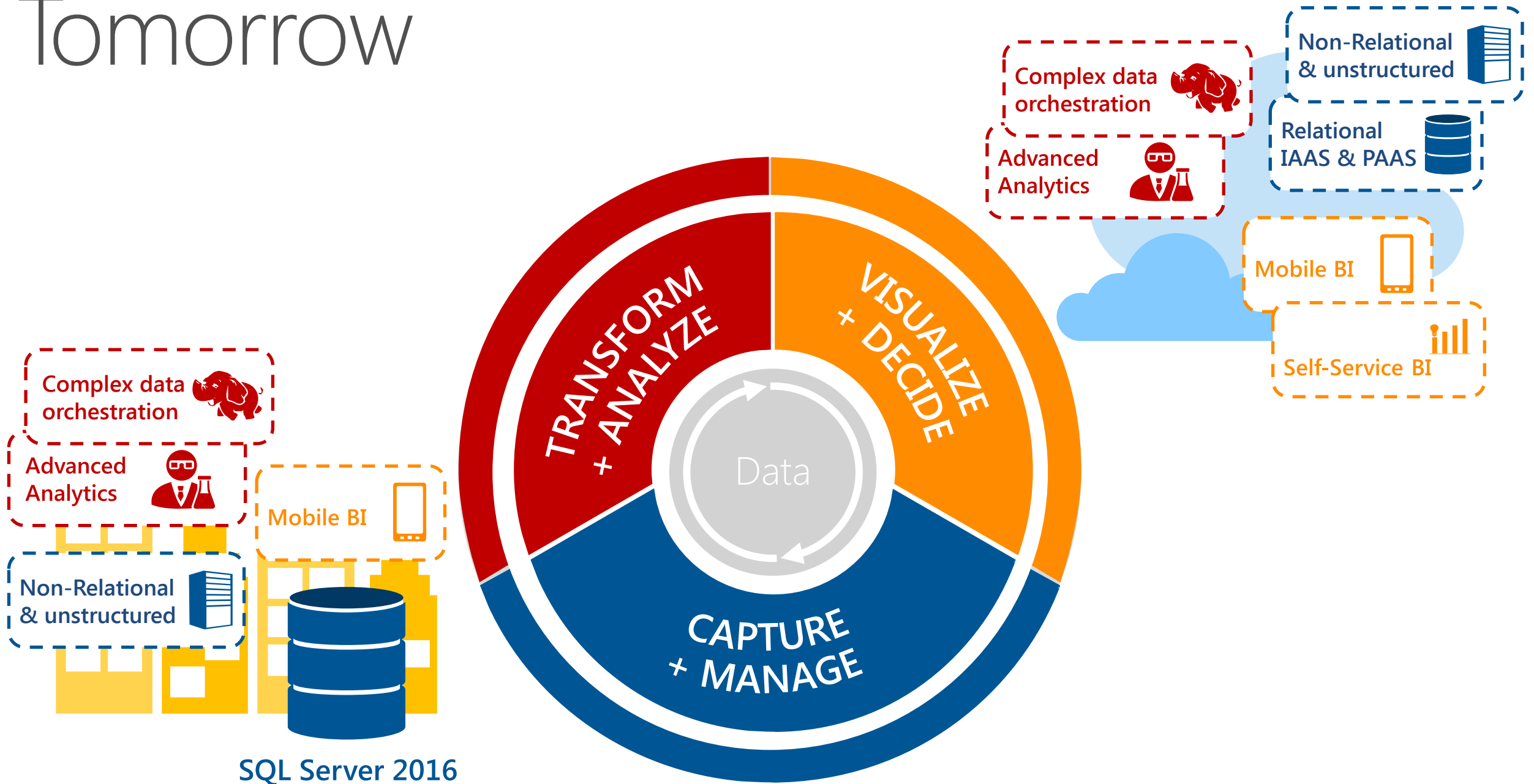
Today



SQL Server 2014



Tomorrow





✓ Look for the SQL Server 2016 CTP2 this summer

<http://www.microsoft.com/en-us/server-cloud/products/sql-server-2016/>

✓ Pre-register for the SQL Server 2016 CTP & Azure SQL DW previews

<http://www.microsoft.com/mcpnews>

SQL Server 2016 CTP2 Features

- In-Memory Enhancements
- Operational Analytics
- Always Encrypted
- AlwaysOn Enhancements
- Row Level Security
- Dynamic Data
- Native JSON
- Temporal Database
- Query Data Store
- Built-in advanced analytics
- PolyBase
- MDS enhancements
- Stretch Database
- Enhanced hybrid backup to Azure



Enjoy SQLDay 2015 ☺

Thank you!

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