A digital Statoil

Oslo 25 November 2014

Statoil

Digitalisation drives the next wave of improvements at Statoil

Safety and sustainability strengthened through leveraging digital technologies

Digitalisation & innovation potential

Value creation producing fields[1]

Above 2 bn USD

Automated drilling - cost[2]

Around

-15%

Field of the future - capex[3]

Around

-30%

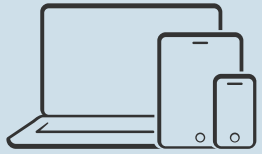
Integrated remote operations

Around 500 million USD

Added value[4]

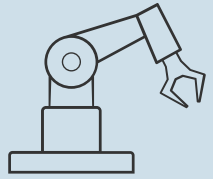
1. *3% increase in production - 2020 to 2025. Statoil share pre-tax.*
2. *Automated drilling compared to conventional.*
3. *New facility concept compared to conventional.*
4. *NPV increase based on the production and opex effects of the integrated control rooms.*

At Statoil, digital opportunity is driven by three technological enablers



Process digitalisation

Data science

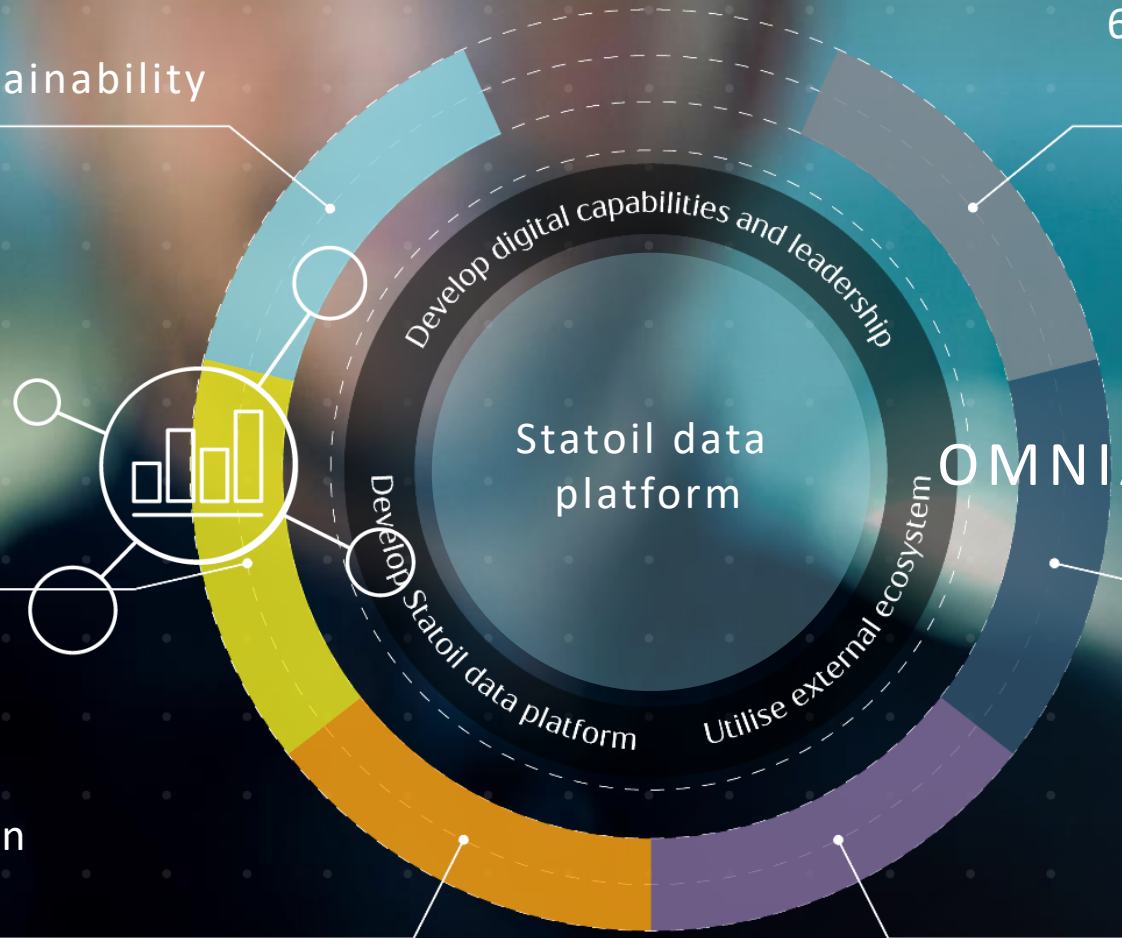


Robotics and remote control

Statoil

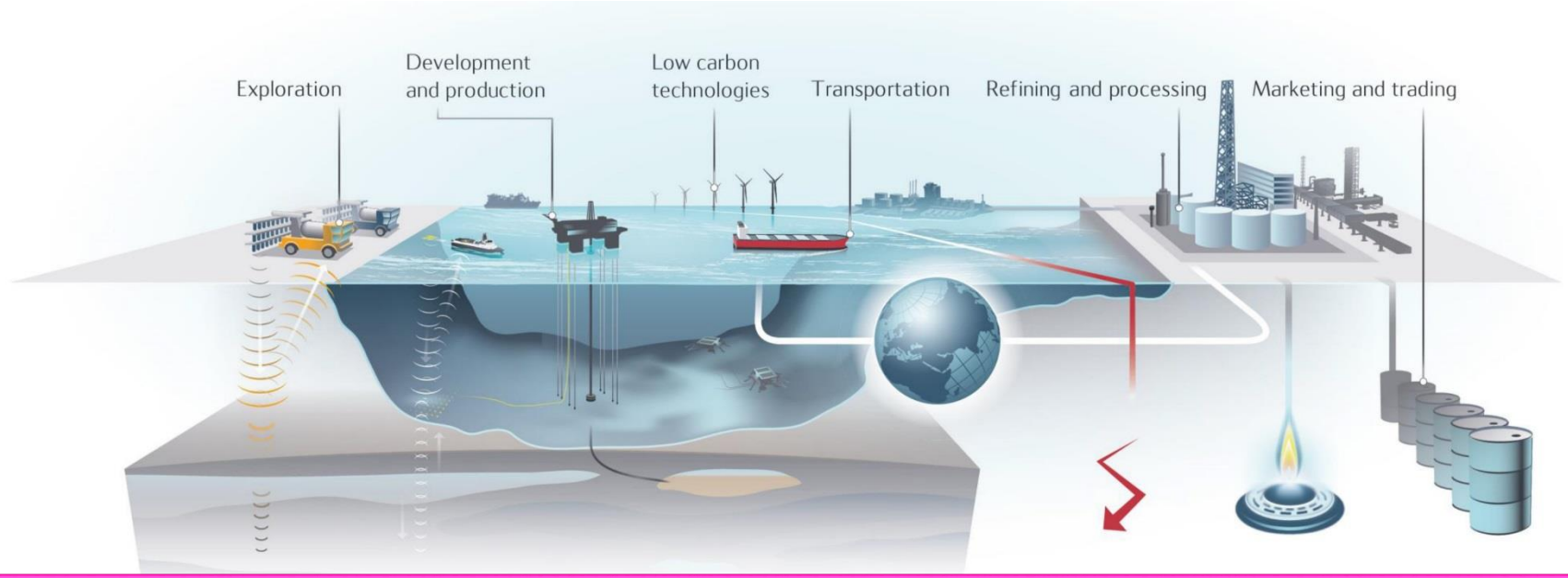
Statoil's digital roadmap

1. Digital safety, security & sustainability
2. Subsurface analytics
3. Next generation well delivery
4. Field of the future
5. Data driven operations
6. Process digitalisation & commercial insight



Statoil

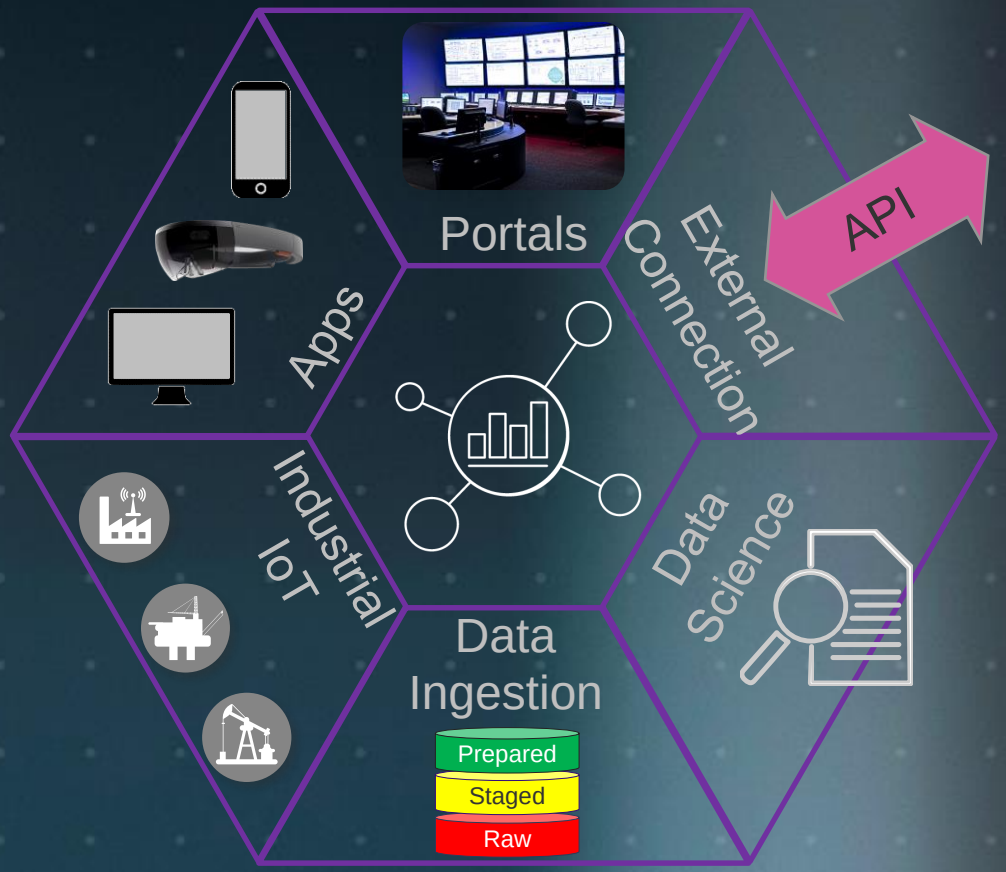
From Silos of Data…
to one common Data Platform for the Statoil Value Chain



Statoil Data Platform Orchestrate all Statoil Data

- Exp
- Project Dev
- Petec
- O&M
- Corpo-rate
- Supply Chain
- Refine-ries
- Trading

OMNIA Capabilities



WHAT

Delivered

- Started ca 1,5 year ago
- Into production April 2017
- Supporting DCoE projects
  - IROC (DPUSA)
  - IOC (NCS)
  - Cognitive SSU
  - Subsurface Data Lake Pilots
- Non DCoE projects
- 10+ Mobile Apps

Technologies

- Data Storages
- API Gateway
- Data Factory Data Pipelines
- Mobile App Dev Architecture and Technologies
- Bulk loading from Assets (plant IMS)
- Streaming data from Assets
- Data Presentation
- Data Visualization
- Data Catalog
- Data Science Workbench

Data

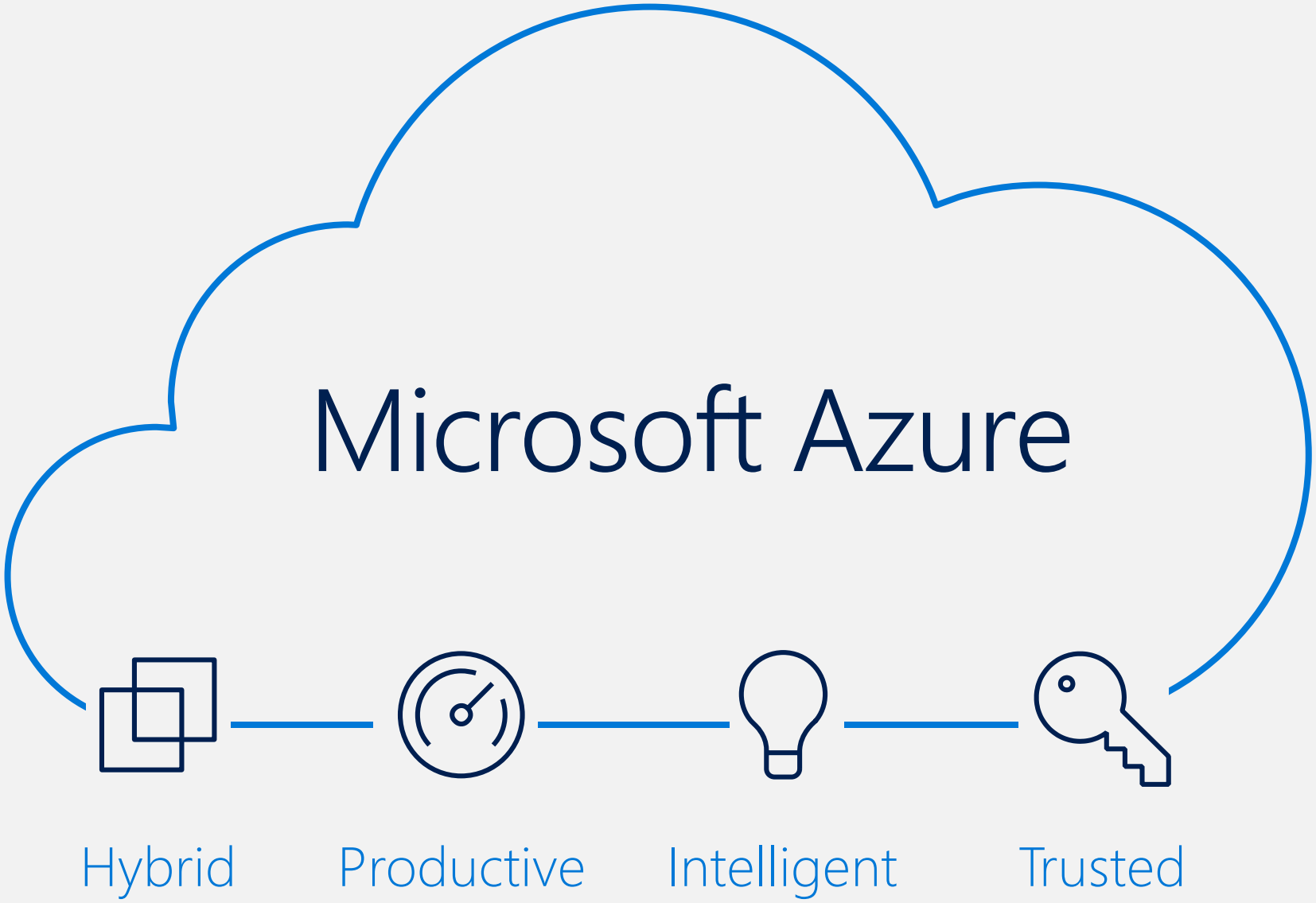
- 19 plants
- 14 000 sensors
- 100+ billion events
- 85 000 DISP applications
- 56 000 SAP Notifications
- 11 non IMS Sources
- 40 TB data

HOW

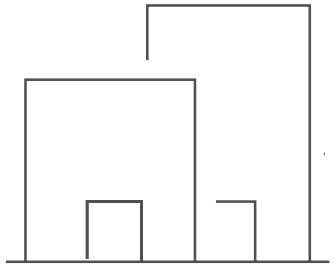
- Cloud Only
- PaaS & SaaS services enabling all capabilites
- Oil & Gas Enterprise Platform
- Standards & Community

Azure

Statoil

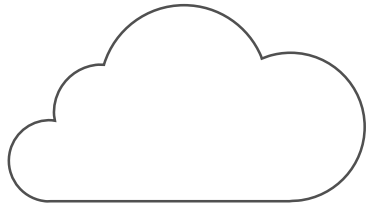

Microsoft Azure
Hybrid
Productive
Intelligent
Trusted

TRANSFORM YOUR BUSINESS WITH A MODERN DATA ESTATE



On-premises
Private cloud

HYBRID



Cloud

Operational databases

Data warehouses

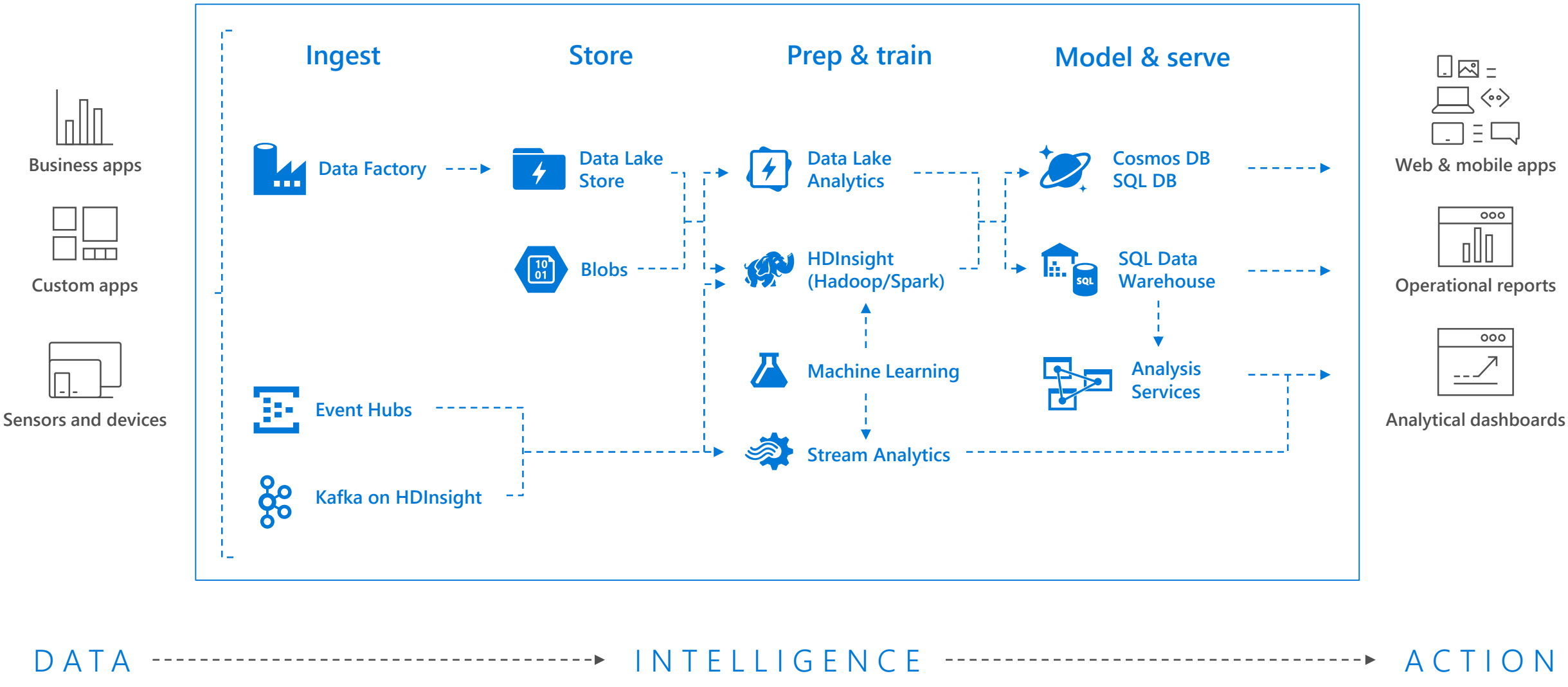
Data lakes

Operational databases

Data warehouses

Data lakes

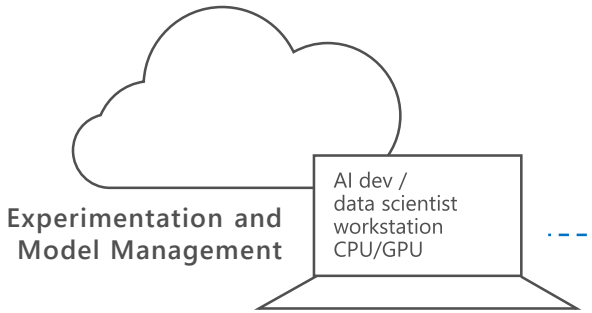
BIG DATA & ADVANCED ANALYTICS



DATA ---------- INTELLIGENCE ---------- ACTION

AZURE MACHINE LEARNING

AZURE MACHINE LEARNING SERVICES



Experimentation and Model Management

Notebooks
IDEs
Azure Machine Learning Workbench

TRAIN & DEPLOY OPTIONS

AZURE

- Spark
- SQL Server
- Virtual machines
- GPUs
- Container services

ON-PREMISES

- SQL Server
- Machine Learning Server

EDGE COMPUTING

- Azure IoT Edge

Azure Data Product Strategy

	Modernize/Expand SQL	Lift & Shift and SaaS	New Globally Dist. Apps	Analytics
				
	Modernize applications with the cloud of your choice	DBaaS for lift & shift and modern applications	Build new, globally-distributed, cloud-native applications	Modern data warehouse leveraging OSS and governance
Products	**SQL Server**	**Azure SQL DB** **Azure MySQL** **Azure PostgreSQL** **Azure MariaDB**	**Azure Cosmos DB**	**Azure SQL DW** **Azure Data Factory** **Azure Databricks** **Azure Stream Analytics** **Azure HD Insight** **Azure Data Lake** **Azure Data Catalog** **Power BI**
Benefits	Choice of OS, dev environment Choice of deployment Lowest TCO Strongest security Best performance	Fully managed database services Intelligence, perf, scale, HA built in Advanced security Most compliant Choice of RDBMS flavors	Global distribution Elastic scalability of storage and throughput Single digit latency guaranteed, leading SLAs 5 consistency models Multi-model + support of most popular APIs	Global scale Security & privacy Best of Open Source & Microsoft AI Innovation Deploy ML models on premises, in the cloud or on the edge Scenarios: Modern Data Warehouse, Advanced Analytics on Big Data, Realtime Anaylicts

OMNIA Solutions

Statoil

Integrated remote operation centre US onshore – In operations in less than 6 months

Field

Safety & automation systems

Sensors

Other source systems

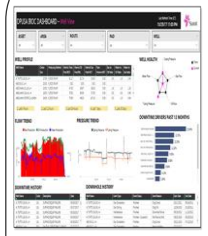
Local, regional or global external data (e.g meterology)

Field

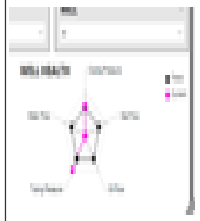
Data transfer from installations to cloud

Data and desicion support to installations

Operational centre



Operational dashboard for decision support



Advanced analytics / machine lerning

Company wide data availability from cloud

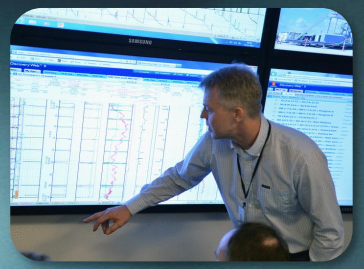
Collaborative environment

Clear and common targets

Statoil

Cognitive SSU Pilot – “Operational planning”

Achieve



IMPROVED OPERATIONAL RISK MANAGEMENT

How

SD

iWIT

DISP

STID

USD

VISUALIZE DATA

TEST WATSON ENABLE LEARNING

End result

DECISION SUPPORT

Statoil

Thank You!

Statoil