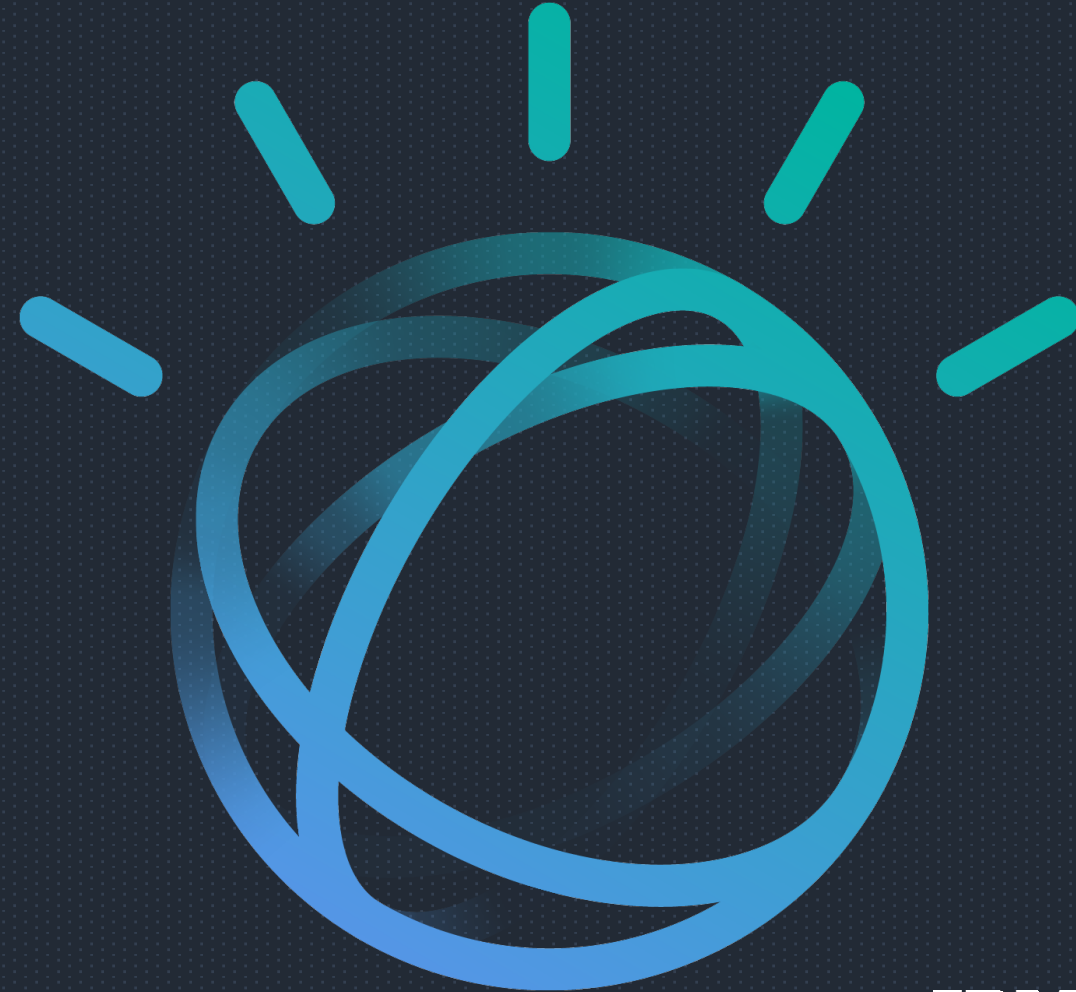


The Next Chapter in Production Operations

SiS Global Forum 2019
Technical Track
Tuesday 17th of Sep
16:15 – 16:45



Øystein Haaland
CTO – WW Chemicals & Petroleum
oystein@no.ibm.com



Agenda

- ❑ Vintage IO
- ❑ The Cognitive Enterprise
- ❑ Transform Operations
- ❑ Dealing with Data – Data Foundation
- ❑ Production Operations & Our Alliance
- ❑ The Hybrid Cloud Journey
- ❑ Close and Q & A



Vintage IO

Going back to 2005...

Automatic detection of events

- Well, process, critical equipment

Automatic evaluation of the effect of events on KPIs

- Production targets, costs or HSE
- From corporate to equipment level

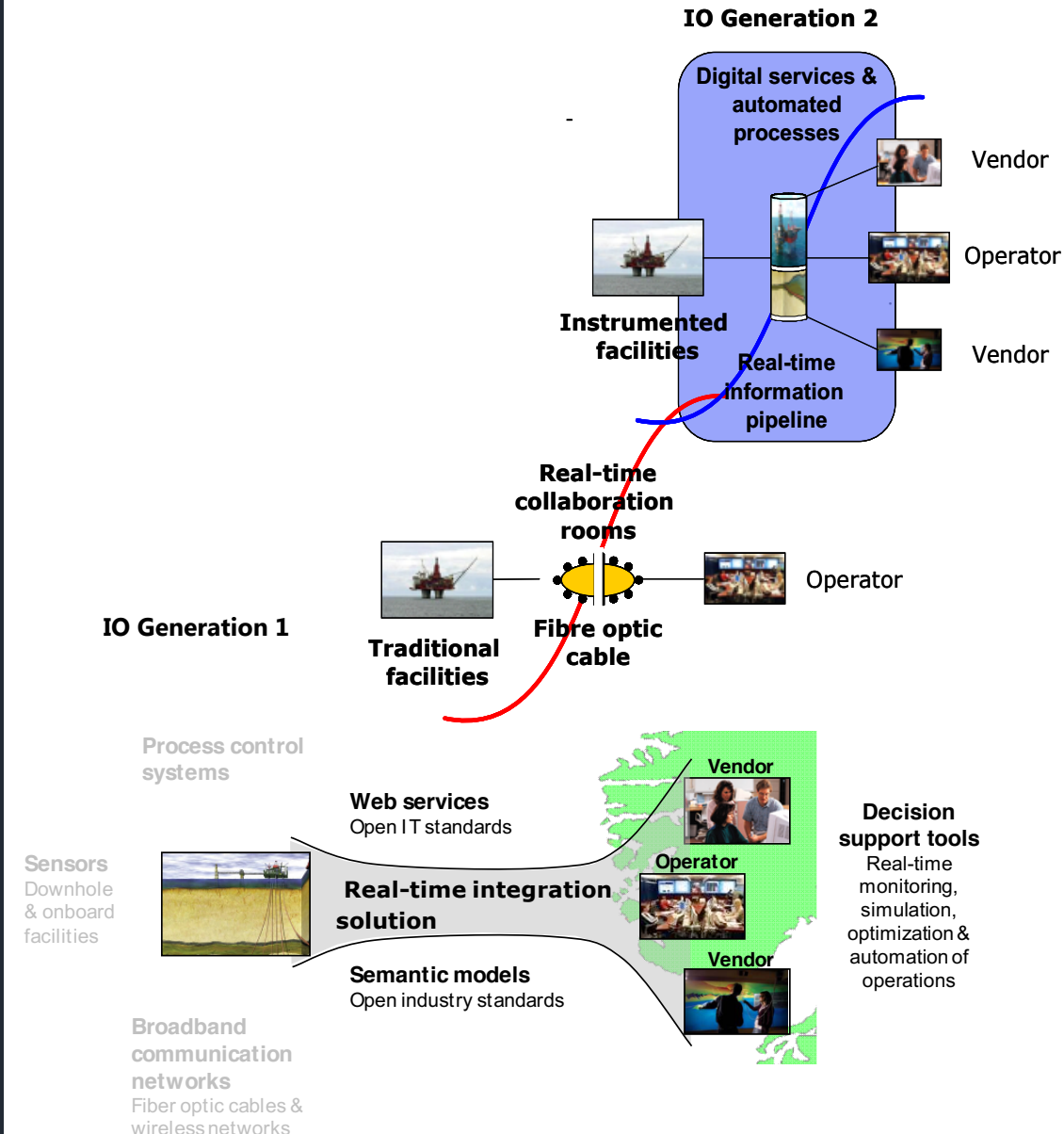
Automatic generation of advices on how to manage events

Automatic processing of events

Automatic follow-up of events, e.g. actions required to handle events

300 bill. NOK on the NCS

Source: OLF (NOG) 2005, 2008



2015 → Similarities across industries

Oil & Gas

“Integrated Operations”

Cross Functional – Collaborative – Operations

See “One asset” – independent of “my location”

Illustrative IO Room



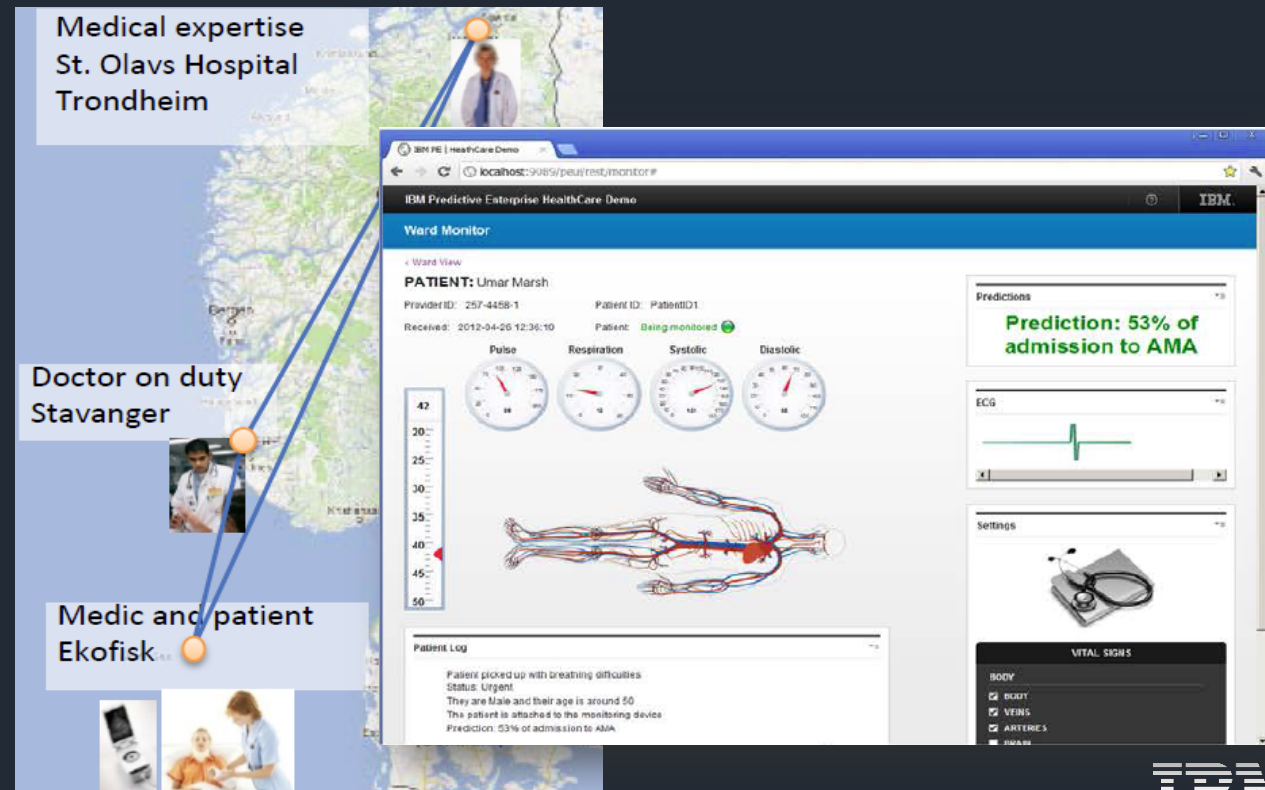
Picture: Statoil (Source – IO Center Trondheim)

Health

Integrated Operations

Cross Functional – Collaborative

See “One Patient”



Industry Examples – SIS Forum 2017



BERNARD LOONEY

Chief executive, Upstream

<https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/news-and-insights/speeches/modernising-our-industry.pdf>

However, digital technology now offers us new ways to address those challenges and prosper in a very different business environment.

In BP, we have used digital technology for decades, but the focus now is on harnessing it for profound and transformational change, across the business.

We have a vision. And that vision is to be the leading digital Upstream company, comprised of globally connected networks of physical equipment, people and digital processes.



Digital technology is redefining possibilities in the Oil & Gas industry

Artificial Intelligence and Analytics



- Supports staff to make decisions
- Identifies business-critical operational improvements

Internet of Things



- Equips physical assets with digital data
- Optimizes existing operational processes

APIs and Microservices



- Enables ecosystem partners to collectively innovate

Blockchain



- Improves identity management and distribution
- Enables transformational business model innovations

Cloud



- Allows data to be stored and accessed, and applications run, from everywhere
- Delivers cost-effective innovation quickly

Mobile



- Improves identity management and distribution
- Enables transformational business model innovations

Quantum computing



- Equips physical assets with digital data
- Optimizes existing operational processes

Cyber security



- Enhances productivity by working autonomously or in conjunction with staff
- Increases worker safety

Automation and Advanced Robotics



- Enhances productivity by working autonomously or in conjunction with staff
- Increases worker safety

The Cognitive Enterprise

The market is entering a new chapter in cloud and digital

CHAPTER 1

Consumer-driven innovation

Digital/AI experimentation

“User applications” driving cloud
(20% of workloads)

Public cloud



- Companies “experimenting”
- “Adding” vs. “transforming”

CHAPTER 2

Enterprise-driven innovation

Digital/AI embedded in the business
and at scale

“Mission critical” workloads driving cloud
(80% of workloads)

Hybrid cloud

Public + Private + Traditional
Open and multi-cloud



- Companies moving to production
 - Transforming mission critical
- End-to-end integration advantaged

Resulting in a re-invented Transform Operations imperative



Transform Operations is the strategy and framework for the transformation into a more predictable, controllable and optimized production stream through:

- Integration of critical processes into a cross-functional, cross-discipline way of thinking
- Capture of operational data and leveraging technology to make better use of data and predictive analytics
- Knowledge sharing, streamlined workflows, and implementation of standard industry practices
- Focus on predictable business outcomes, operational efficiency, and sustainable performance



People

Skills Development
Virtual teams using internal / external experts
Multidiscipline knowledge
Attract and retain talent



Technology

Proactive monitoring and remote diagnostics
Sensors and Automation
Enabling infrastructure and data management
Collaboration environment



Work Processes

Collaborative and multidiscipline based
Consistent application of standards and processes
Real-time decision making
Leverage internal / external and vendor expertise
Remote / integrated decision making



Organizational

Organizational structure to support decision outcomes
Communities of Practice (CoP) and Centres of Excellence (CoE)
Emphasis on HSE Management
Integrate diverse initiatives across the organisation

The approach to this challenge has 3 major dimensions



Cognitive and Analytics



Process Orchestration



Dealing with Data - Data Foundation



Source: [Morburre/Wikimedia Commons](#)



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ARY MODE: 40 RPM / 6 -13 KJ/FTLB
FROM 3,150-FT (BIT DEPTH)

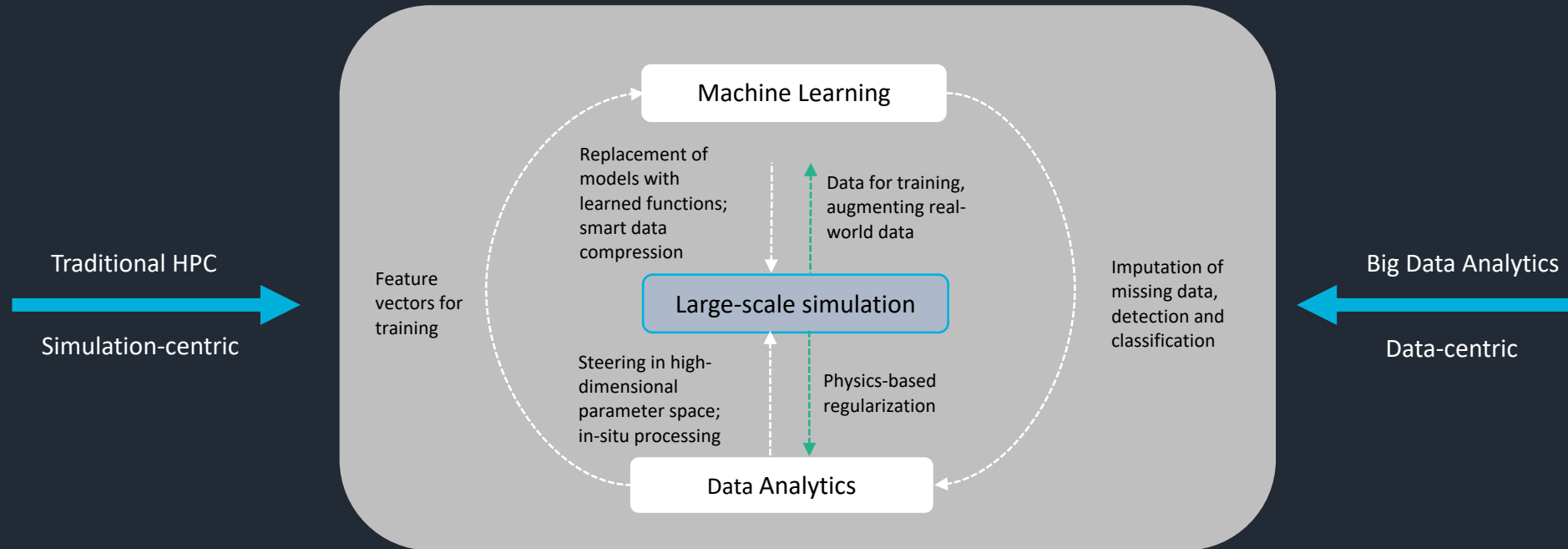
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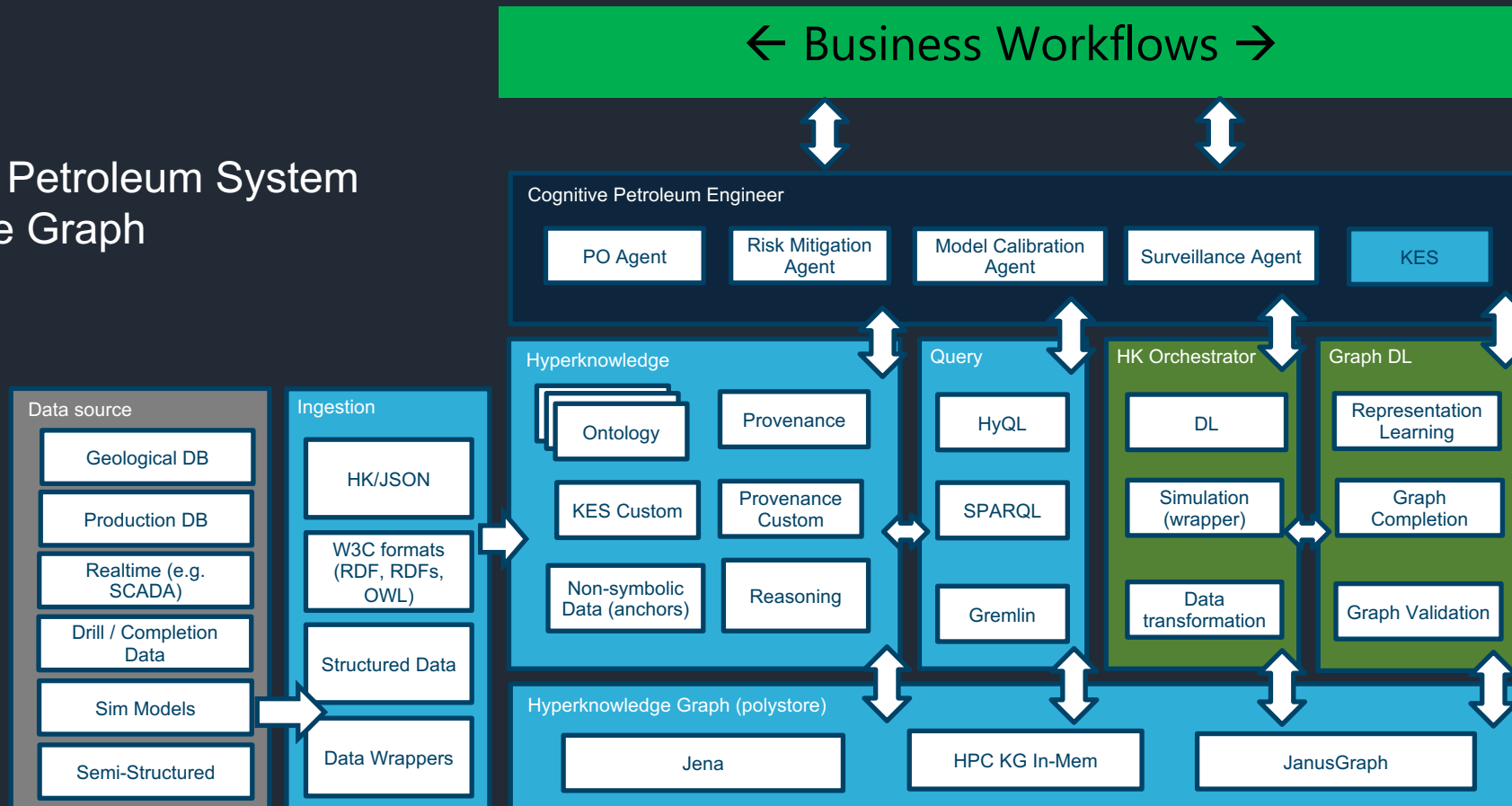
Era of Data-Centric and Intelligent Discovery



- Explosion of data generated by large-scale simulation leading to a paradigm shift: from simulation-centric to **data-centric discovery**
- Data analytics and machine learning used to turn reams of simulation data into **actionable** information that can be used for better interpretation and steering
- Applying machine learning for making existing simulation codes more **intelligent**, more productive, and more robust
- Increasing interest in **large-scale** analytics and machine learning on high-end platforms
- Emerging hybrid workflows that embody the **entire** inference cycle of discovery
- Co-deployment of **heterogenous** software stacks

Building “Technical Workflows”

Example - Petroleum System Knowledge Graph



Legend

- PO Agent – Production Optimization
- KES - Knowledge Exploration System
- DL - Deep Learning

Building “Technical Workflows”



C&P Industries

From 2015, SIS and IBM has provided clients Integrated Operations transformation services that unifies the decision environment by providing support critical for productivity and efficiency gains in today’s oilfield operations.

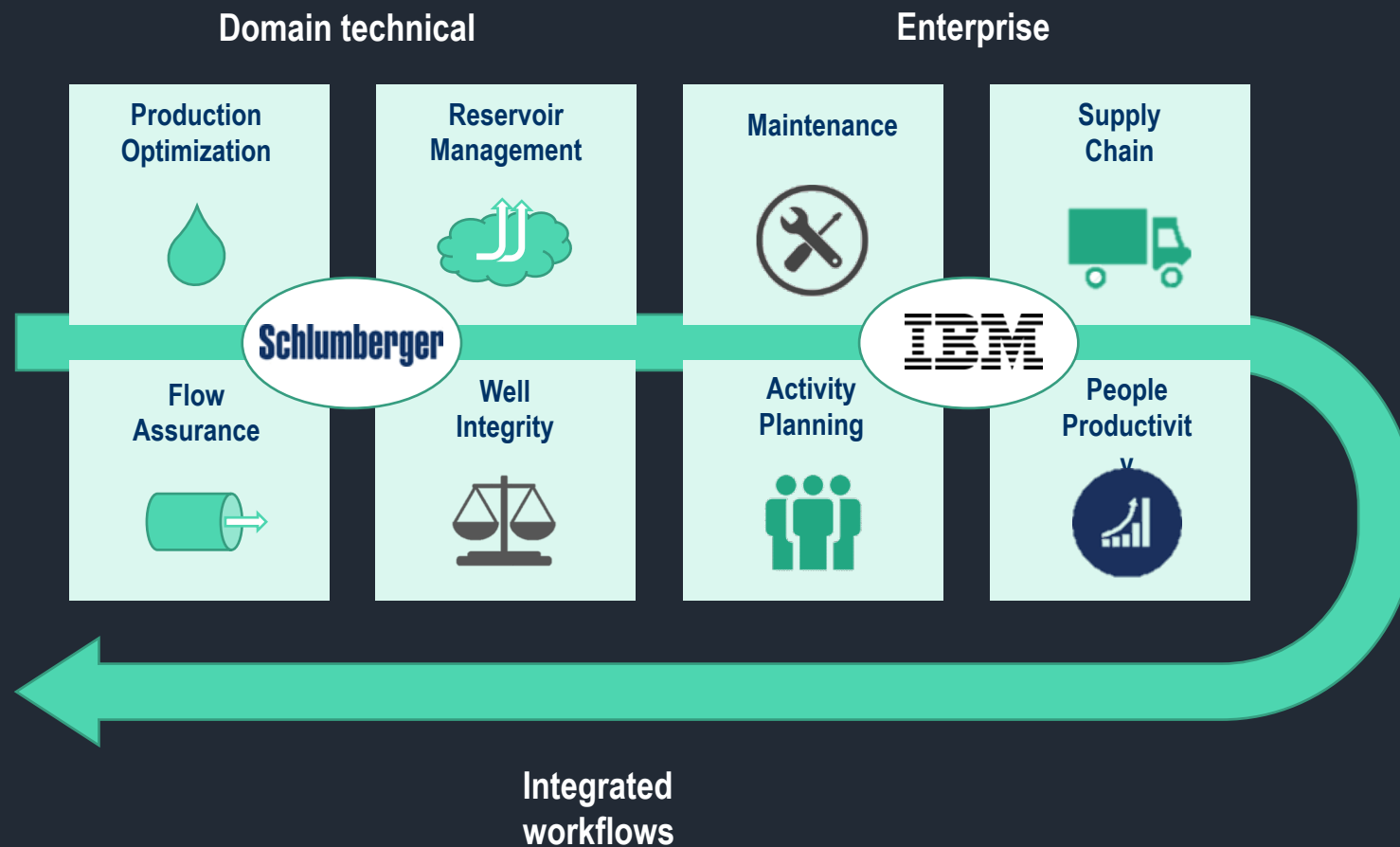
Together, we enable **Operational Excellence** by infusing AI into production optimization workflows with cloud-based enterprise business processes to enable multidisciplinary solution teams to implement customized business offerings spanning asset to enterprise levels.

Schlumberger and IBM Introduce New Service to Optimize Integrated Upstream Production Operations

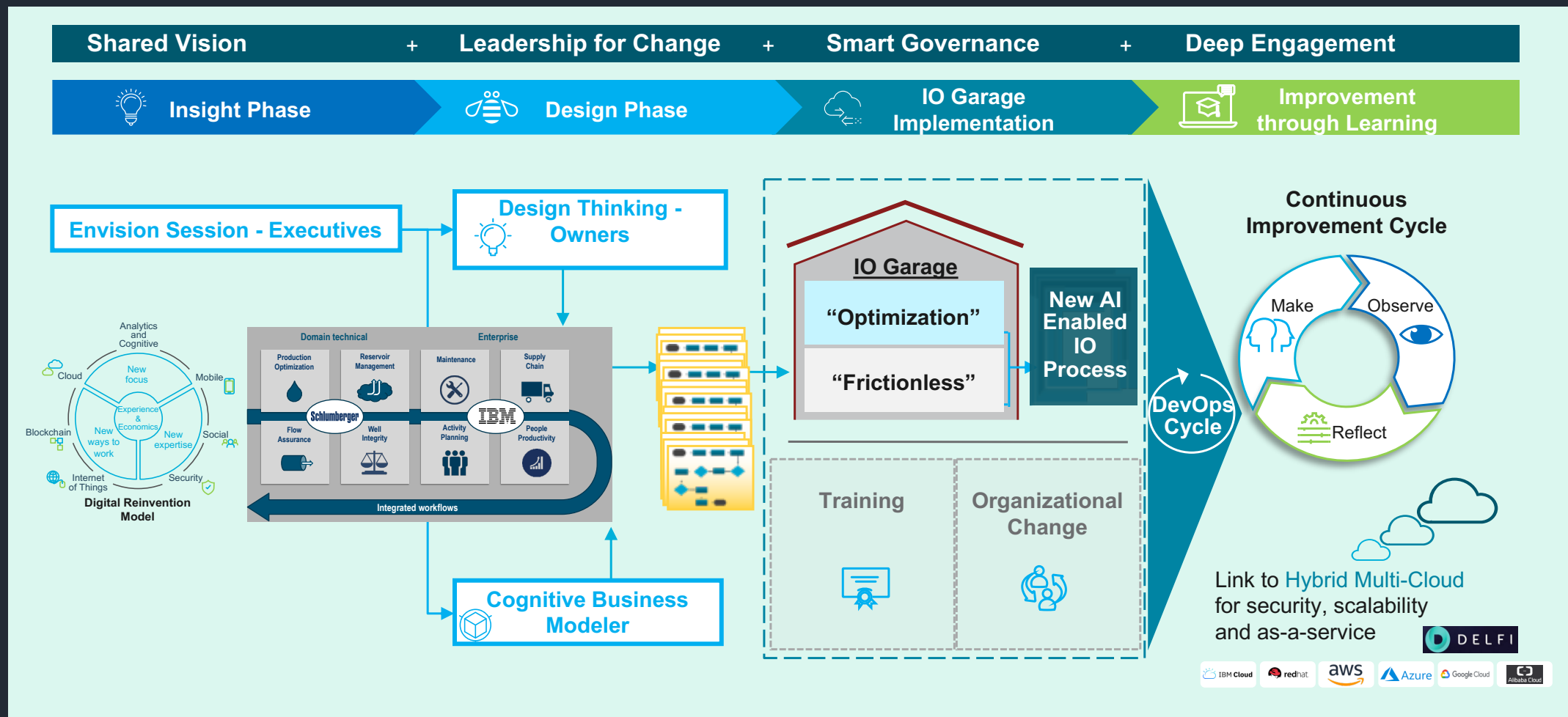
Multidisciplinary teams to deliver improved business performance across production operations

LONDON, August 31, 2015—Schlumberger and IBM today announced that they have teamed up to provide integrated services to upstream oil and gas customers that will improve the business impact of production operations projects.

Operational Excellence requires expertise across all capability areas



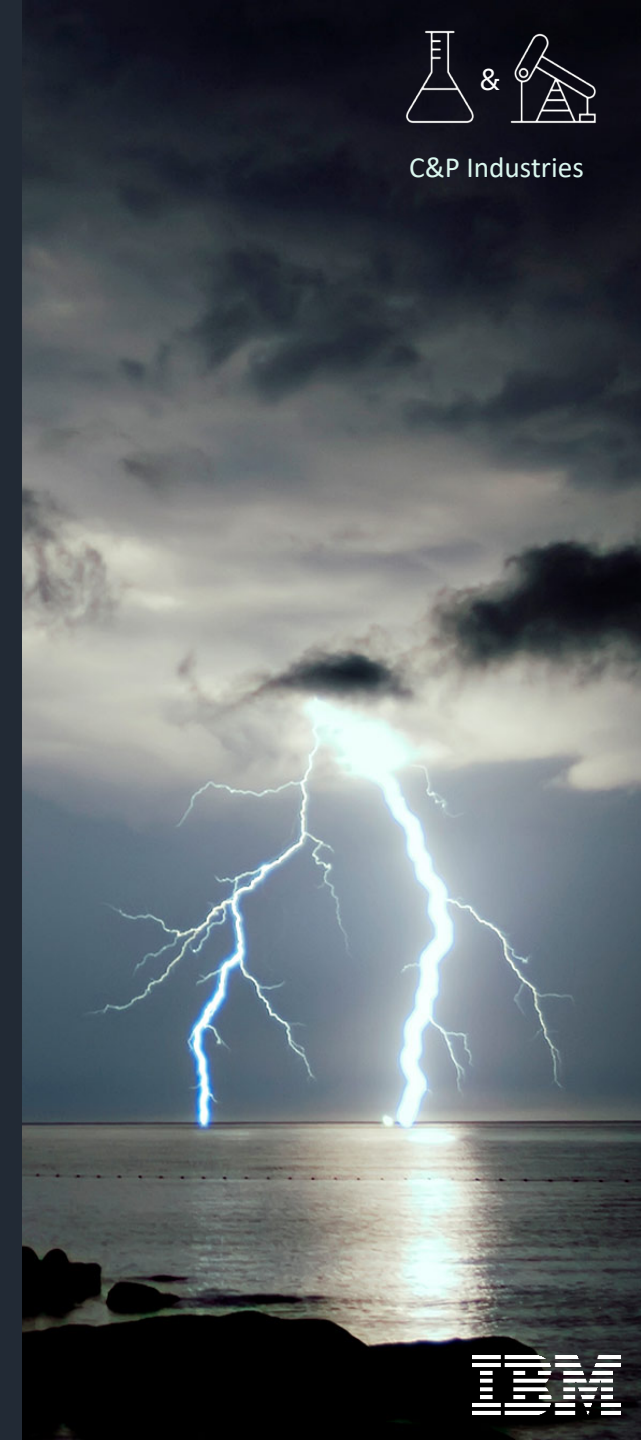
IO 2.0+ : Deliver AI infused E&P workflow automation on hybrid multi-cloud



Storm clouds ahead

The Hybrid Cloud Journey

- “By 2021, **99%** of chemicals and petroleum organizations plan to adopt multicloud architectures,
- but only **44%** have a multicloud management strategy and
- just **47%** have procedures and tools to operate a multicloud environment.”



Successful enterprises accelerate their journey to cloud...

TODAY

Unique workload and data needs

Compliance, security, location require choice

Multiple clouds and vendors

Hard to connect across clouds and the data center

Technology generation gap

Need to broker cloud-native and traditional



TOMORROW

Build once, deploy anywhere

For optimized data and workload placement

Open, secure, and integrated

Visibility, governance, and secure data access

Culture and skill transformation

Best practices, proven methods, and tools

THANK YOU

Production Operations – Chapter 2 – Cognitive Enterprise
PO@Anywhere!

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