Oil & Gas

Digital Transformation for Oil & Gas Drilling

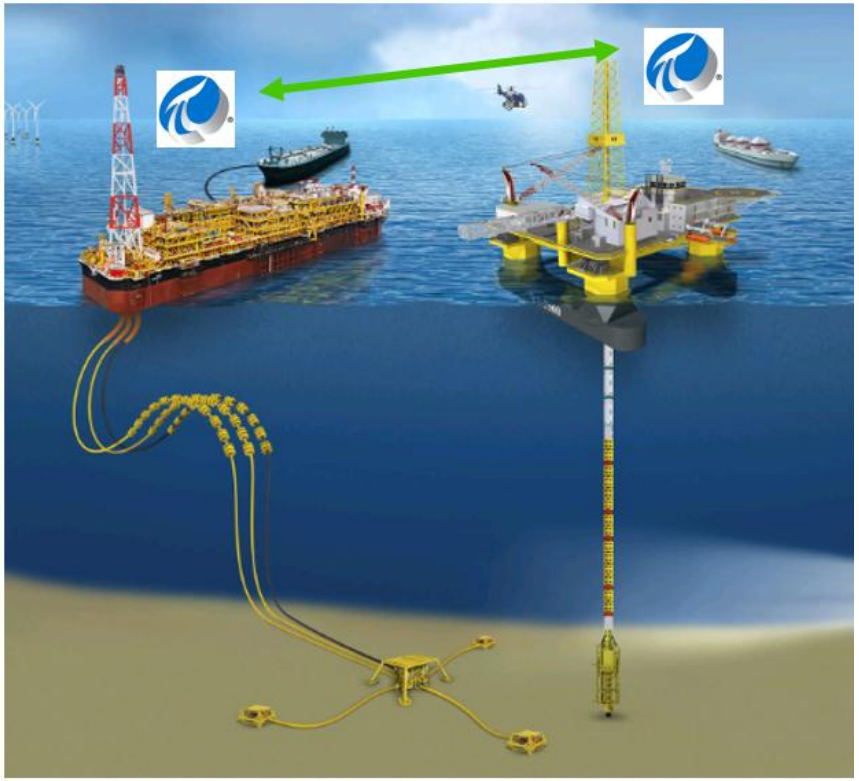
Presented by **Cindy Crow**
Global Oil & Gas Industry Principal

OSIsoft.

Digital Transformation

- **Digital transformation** is the change associated with the application of digital technology in all aspects of human society. (Wikipedia)
- Digital transformation may be thought of as embracing digital technologies:

digital competence → digital usage → digital transformation



Many discussions regarding PI in drilling, why?

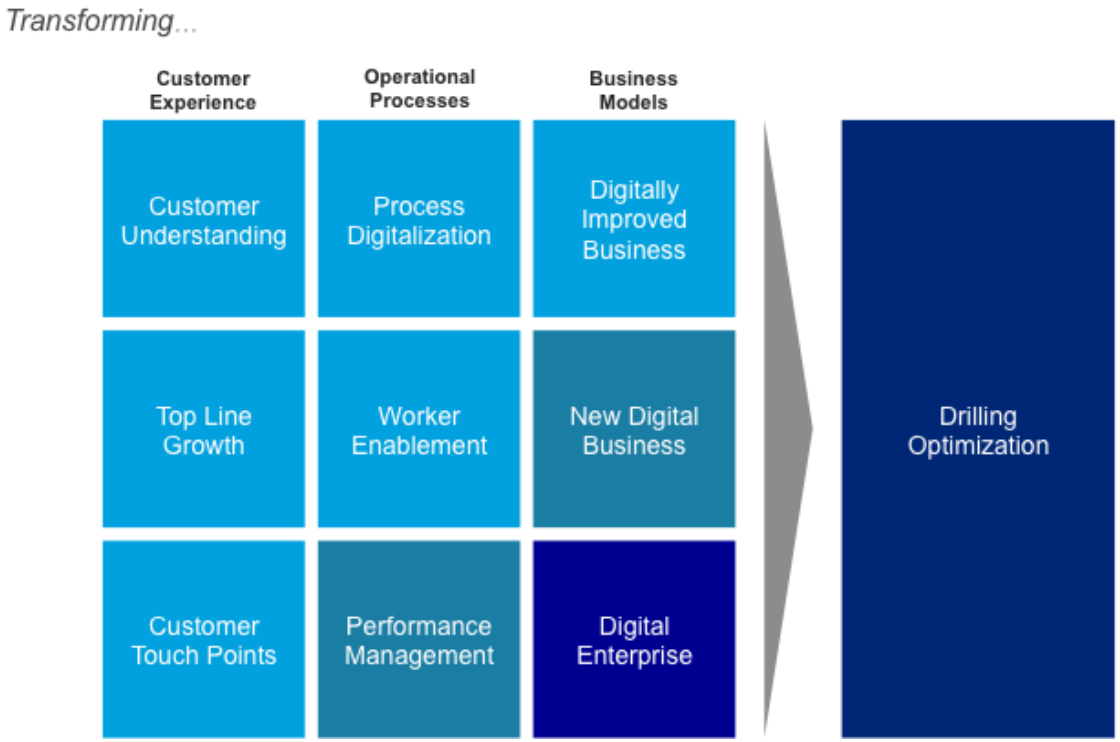
- Enabling historical drilling information analytics.
- Providing instant access to drilling data.
- Supporting consistent rig-site data capture and reporting across all operations.
- Supporting multiple units of measure across the globe.
- Enabling operations engineers to remotely oversee drilling. (CBM, workflow improvement, etc)
- Enabling analytics and benchmarks to be performed.
- Making more informed decisions at the time they have to be taken.

Transocean’s Digital Transformation

Agenda

- **Transocean's Digital Transformation**
- PI Vision enabling Drilling CBM

A Digital Transformation Journey toward Drilling Optimization



Why is this Journey needed?

Some quotes…

"Since the beginning, drilling has been at the hands of humans, but this is about to change with the help of autonomous computer-controlled drilling operations – drilling automation."
- Robin Dupre, "Is Automated Drilling de Industry's Future?", Rigzone

"However, the industry has stopped short of adopting fully-automated processes for offshore drilling, focusing instead on 'human-centric solutions… …The big part missing is integrating the different systems, especially with all the data being gathered while drilling and letting the system respond automatically to what is going on."
− Eric van Oort, U. of Texas - Austin

"The aim is to bring the data to the expert, not the expert to the data."
- Peter Zornio, Emerson

"… the repetitive nature of automated drilling may eliminate the performance variability typically seen from one well to the next within a drilling program."
− "Oil Field Review", Vol 24, 2012. Schlumberger

"The O&G industry as a whole is waking up to the fact that digitisation and automation have transformed other industries, such as commerce and manufacturing, and that they have been left behind."
− The Economist, April 2017

"There is a need to link surface and downhole measurements with near real-time predictive models to improve the safety and efficiency of the drilling process."
− SPE - DSATS

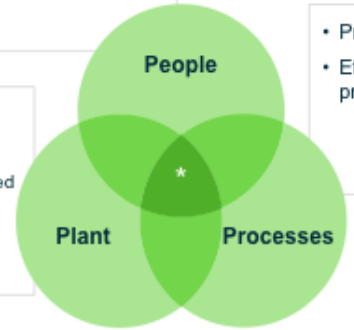
Challenges in Drilling Optimization

Factors

- Personnel Safety
  - Reduction the amount of people on oil rigs improves safety and significantly reduces cost
- Quality Management
  - Human in the loop factors

- Process Safety augmentation challenges.
- Efficiency improvement issues due to process inconsistency.

- Equipment Performance Observability
  - Insufficiency of instrumentation
  - Lack of data standards to enable condition-based monitoring, diagnostics, prognostic and product lifecycle management.
  - Data Quality



Challenges

- Low volume and high capital requirements create a high barrier to entry
  - Incentives to innovation are hindered
- Not possible to integrate different systems at the data layer.
  - Lack of equipment standards even within the same OEMs
  - OEM product NPT is a consequence of poor quality in many cases driven by the lack of data
- Lack of knowledge codification

But Digital Transformation in itself has its own set of challenges too..

Data Management

- Data capturing and data cleansing
- Data normalization
- Data Management Policy and Governance
- Data Sharing Management and Cyber-Security

IT Infrastructure Management

- OT and IT governance
- Scalability, Availability, and Standardization
- Multiplicity of platforms with varying degrees of quality
- Platform architecture: edge, fog and cloud levels.

Knowledge Management

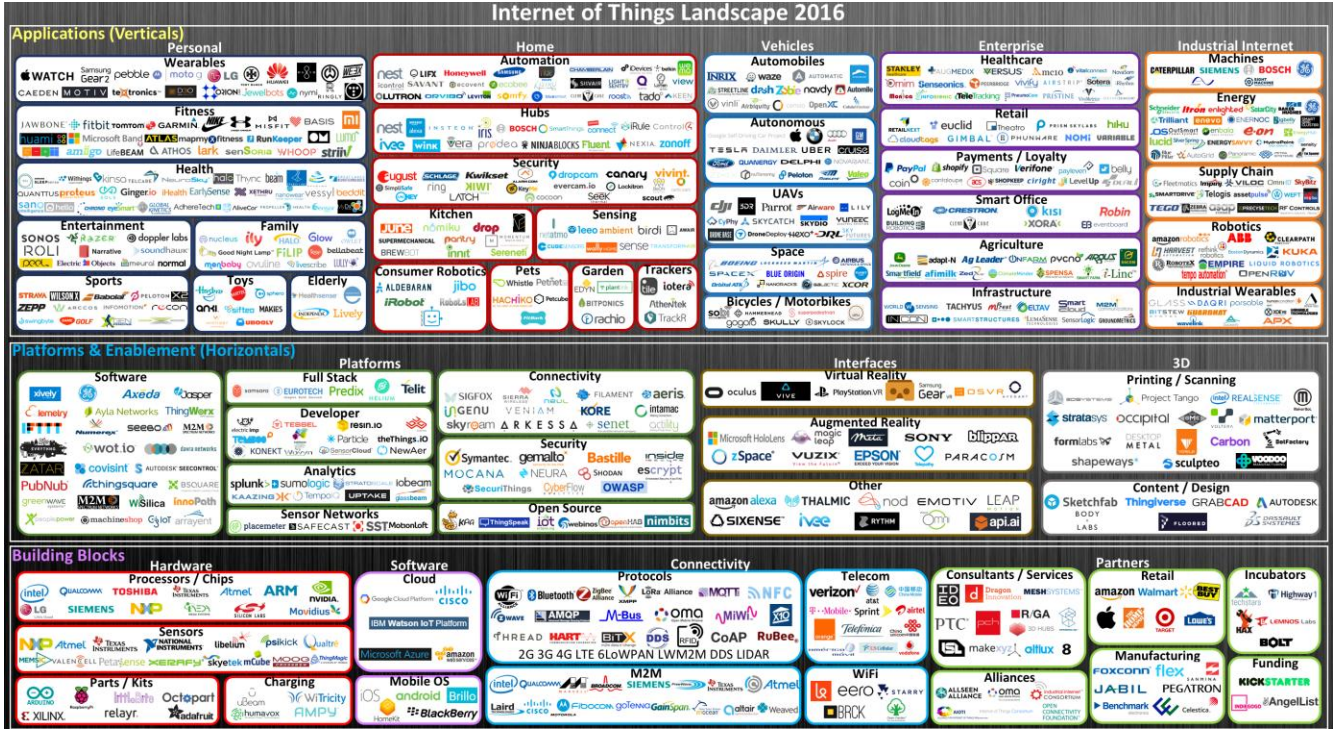
- Too many platforms competing for attention… … too many solutions looking for a problem
- Novel business models trying to position themselves to provide value-added services based on knowledge harvested.
- Lack of understanding of analytic needs

Business Factors

- Business model delivery, governance, execution and control
- Competitive landscape
- Regulatory environment
- Customer Policies
- Liability and other legal elements.

Digital Platform Challenges

The digital platforms landscape is still on early growth stage

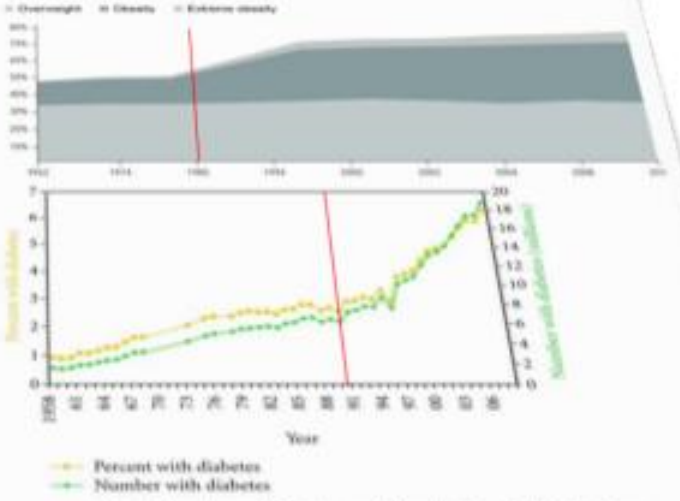


Big Data Challenges

Better information does not equal better decisions

- U.S. Nutritional Labelling and Information Act of 1990 required labels on food as we know them today
- Obesity and diabetes have continued to rise, even more steeply since then

Nutrition Labelling and Information Act of 1990

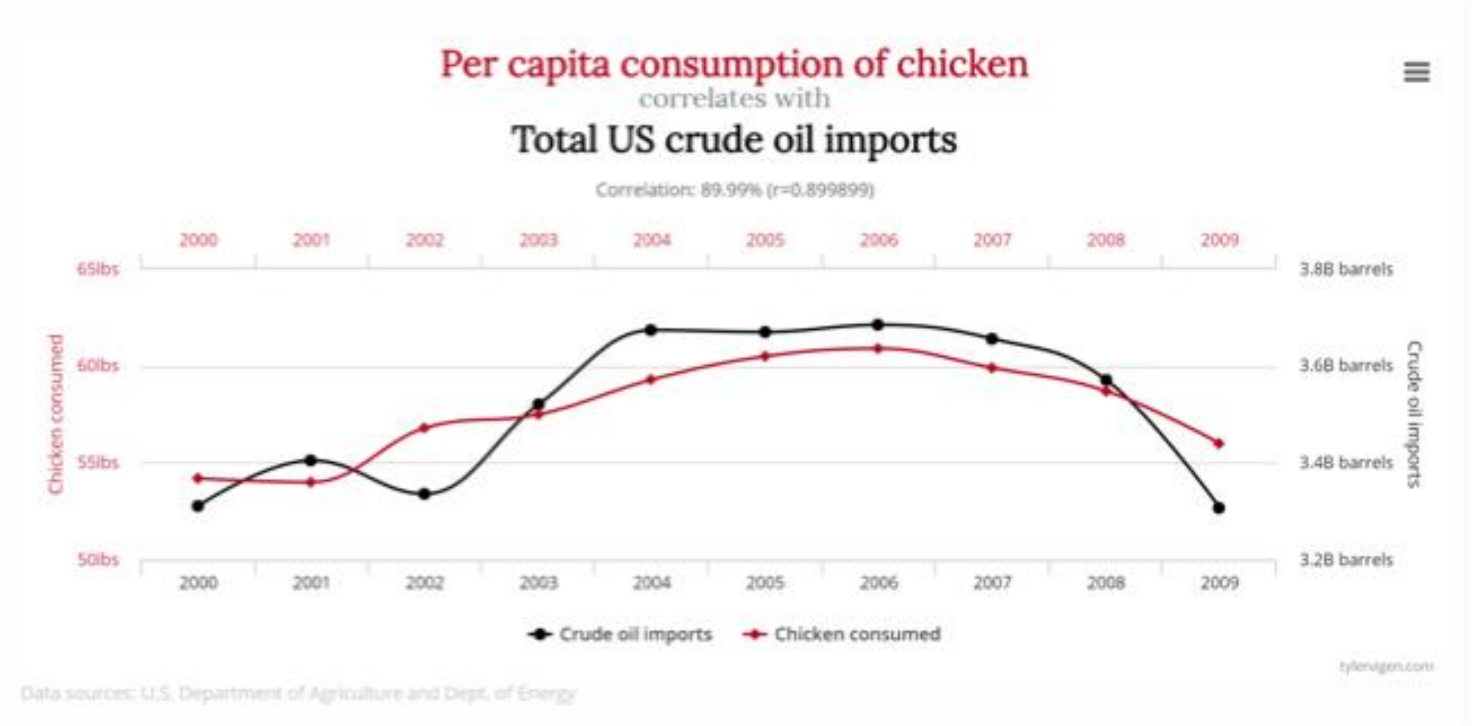


CDC (top) and National Institute of Diabetes and Digestive and Kidney Diseases

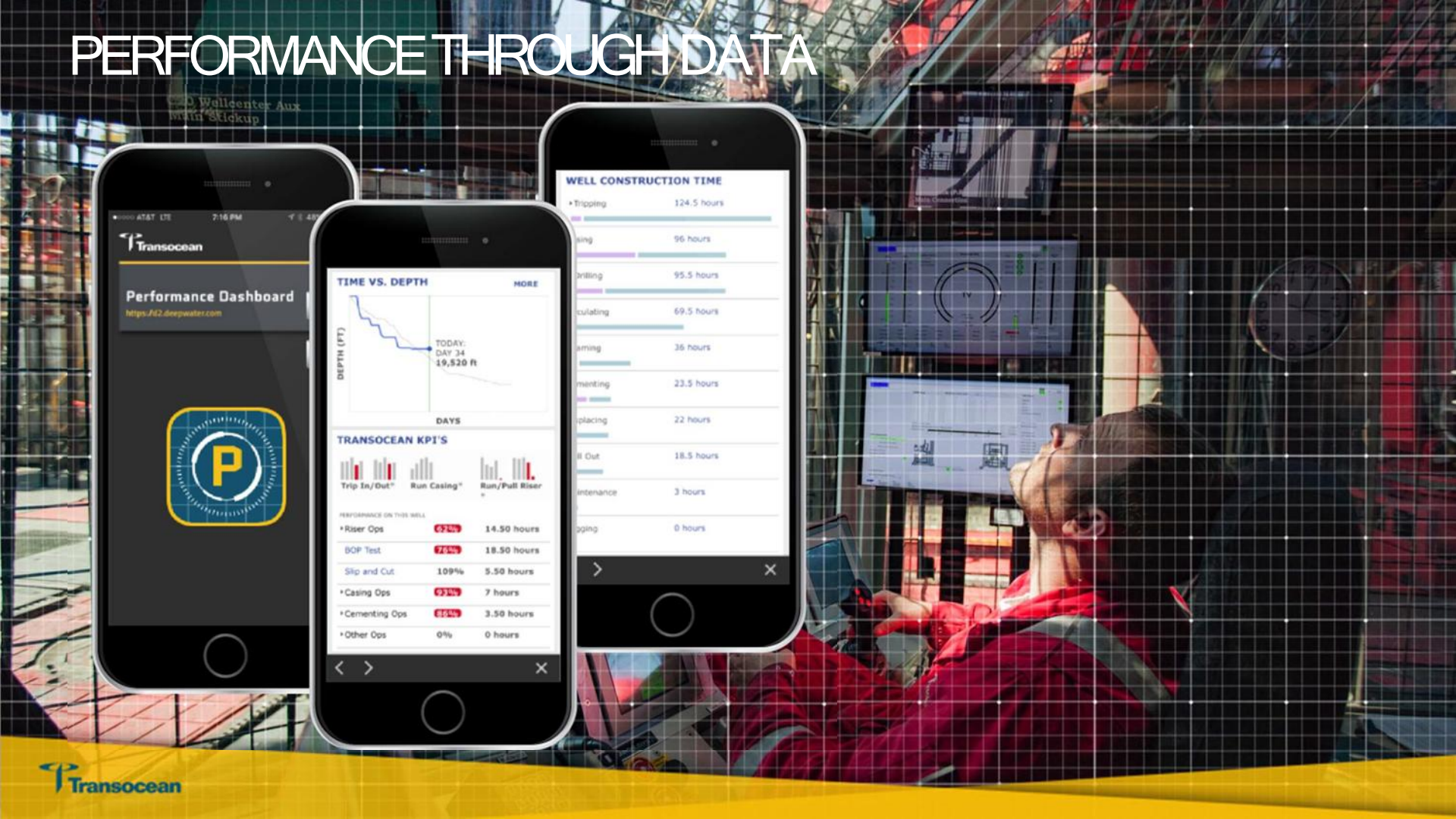
luxresearch

Analytics Challenges

Correlation is not causation….



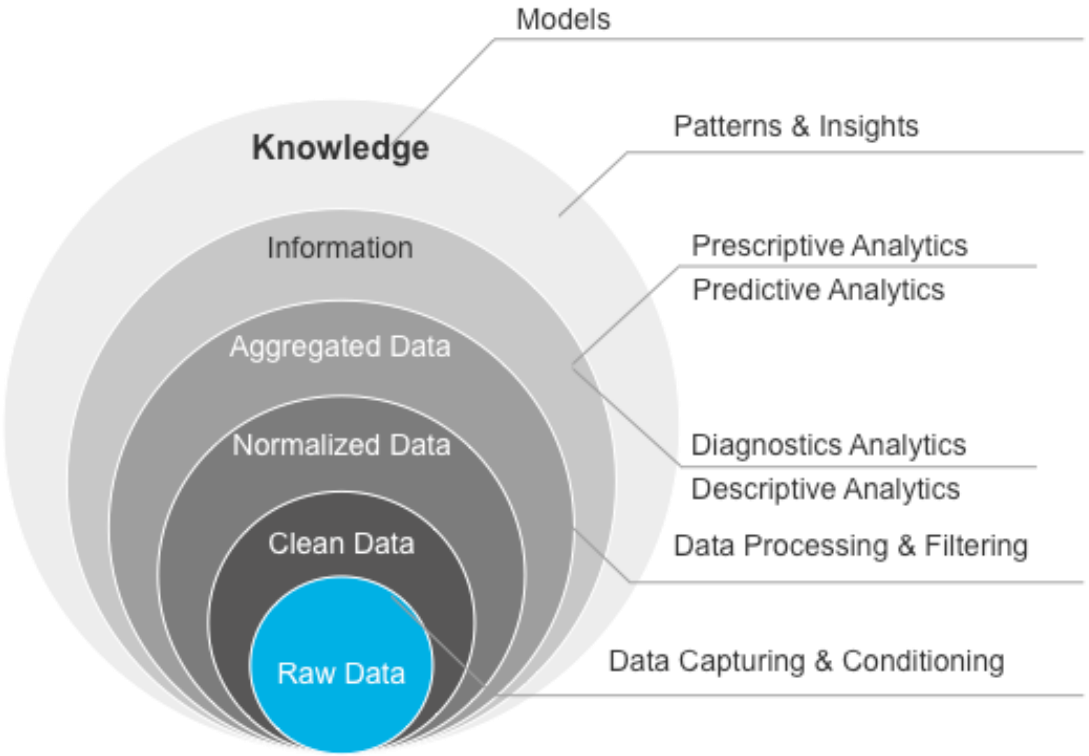
PERFORMANCE THROUGH DATA



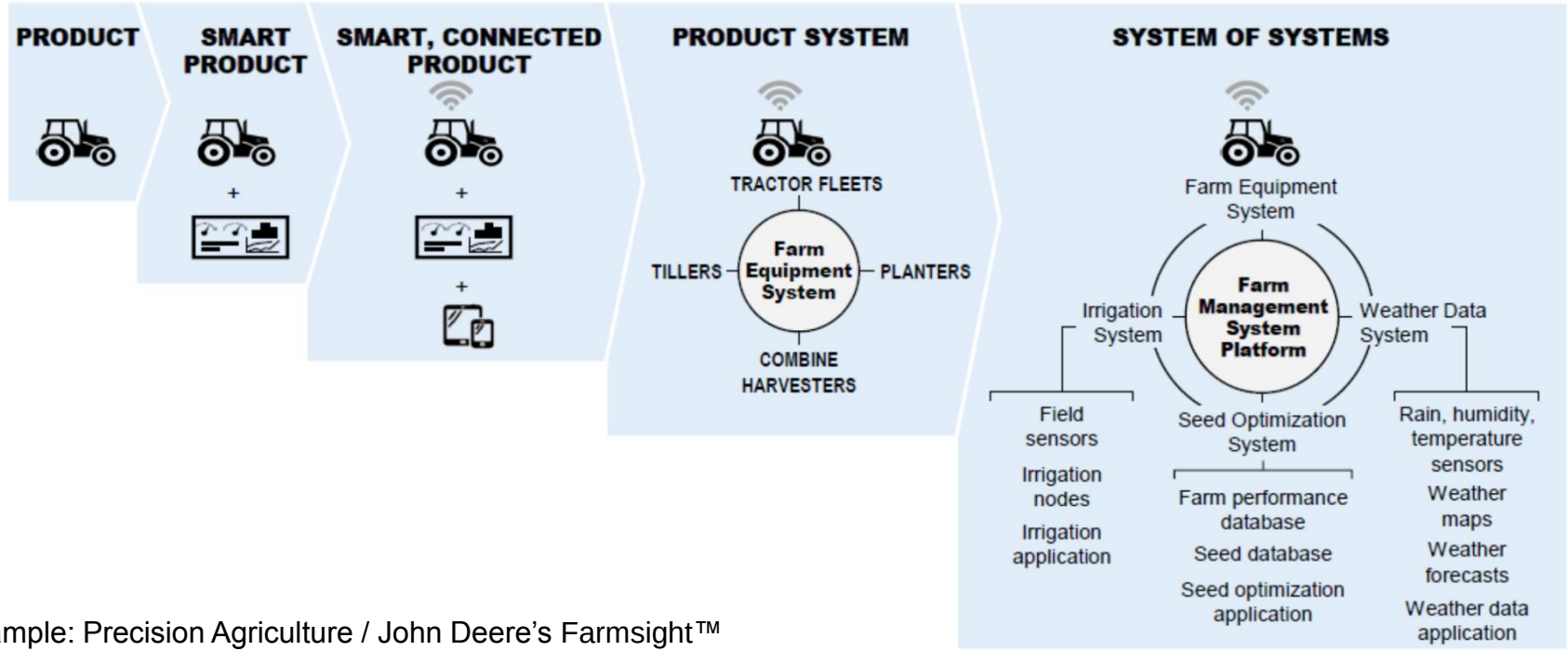
Transocean

Creating Value with Data

A business decision framework leveraging smart, connected products



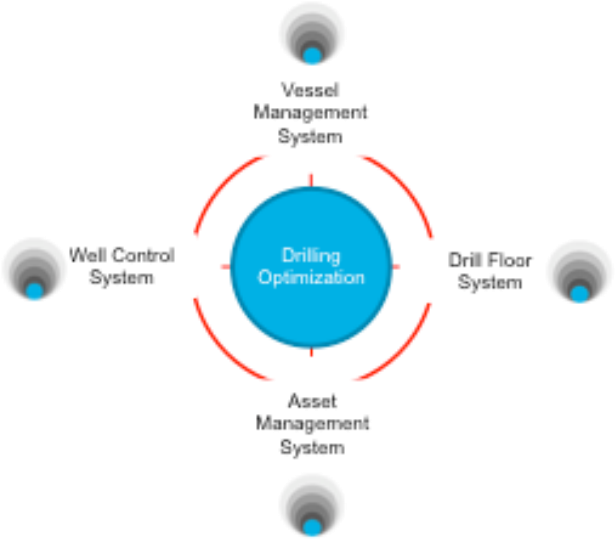
Expanding Industry Boundaries



Example: Precision Agriculture / John Deere's Farmsight™

Putting it all together

A Systems of Systems Approach

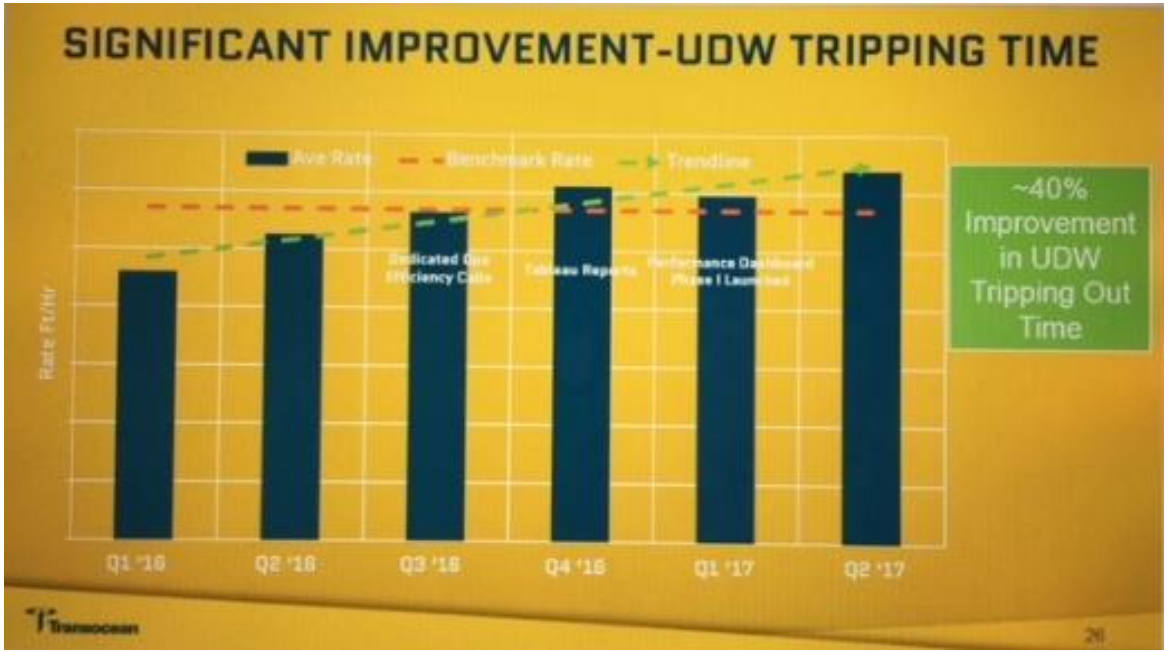


Business Strategy driving the Digital Transformation

Ultra Deepwater Rigs Tripping Time - Real Results

- 40% improvement for operations-$$$
- Transparency to the Crews

Allowed setting 20% KPI
to achieve further reduction



Agenda

- Transocean's Digital Transformation
- **PI Vision enabling Drilling CBM**

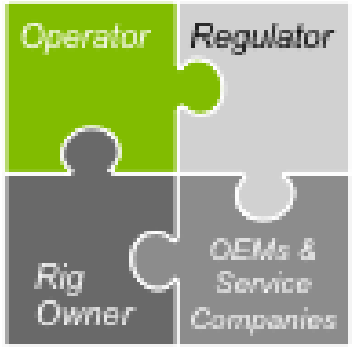
PI Vision enabling Drilling - Demo

Nathaniel Adebayo - Industry Champion

Conclusions

The Digital Transformation journey has **many business and technical challenges.** A **sound business strategy** along with an **innovative mindset** toward the **enablement of new or enhanced business models should be the driver toward successful execution**.

It is not about data, big data, or IoT platforms. **Data provides no value without a clear business strategy.**



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Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

Please remember to…

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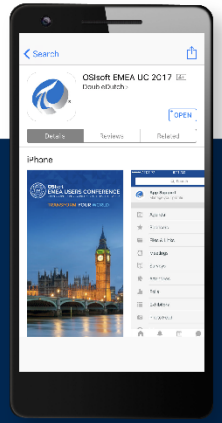

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Danke

谢谢

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado