# On Digital Transformation for O&G Drilling

## Overcoming the challenges to deploy a robust IoT Strategy

### A system of systems view

**Jose A. Gutierrez, Ph.D.**

**October 4th 2017**

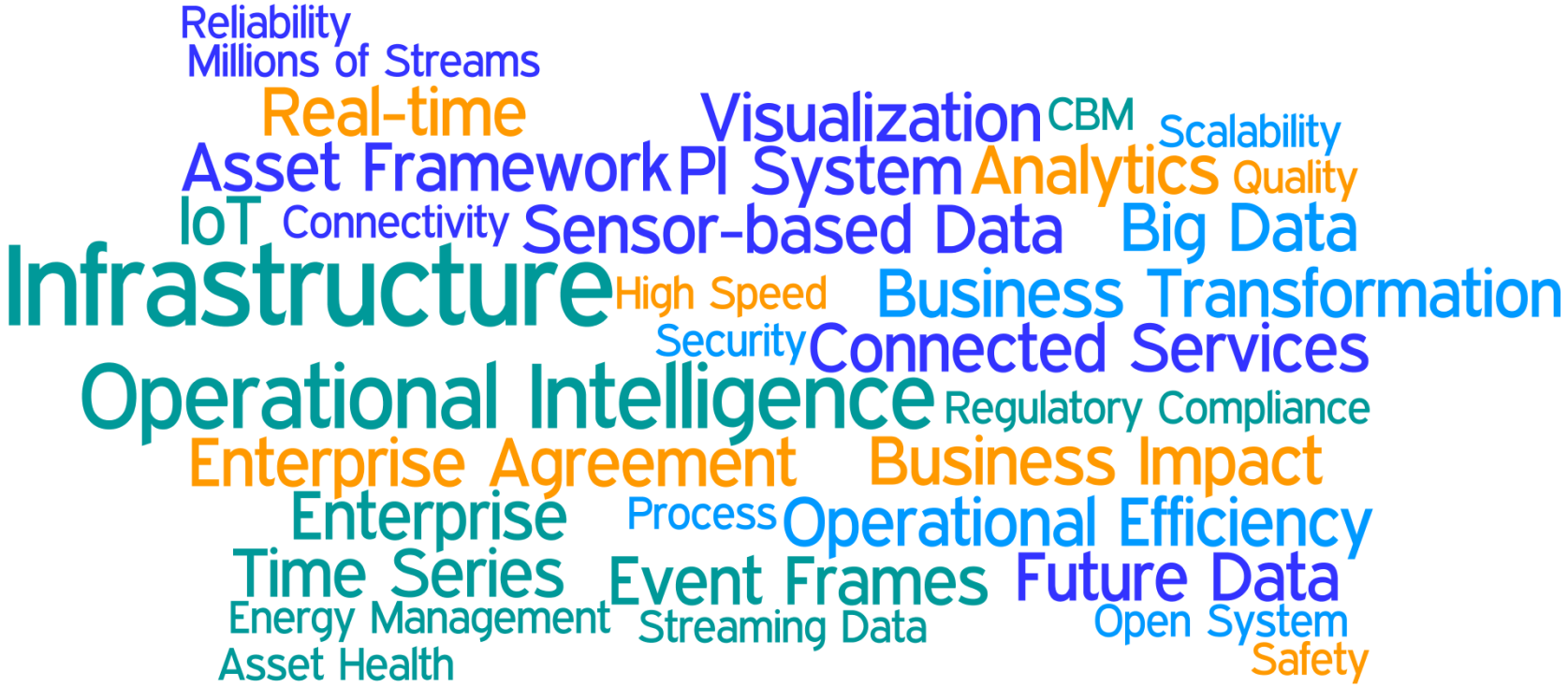
# Adventures in the IoT Jungle

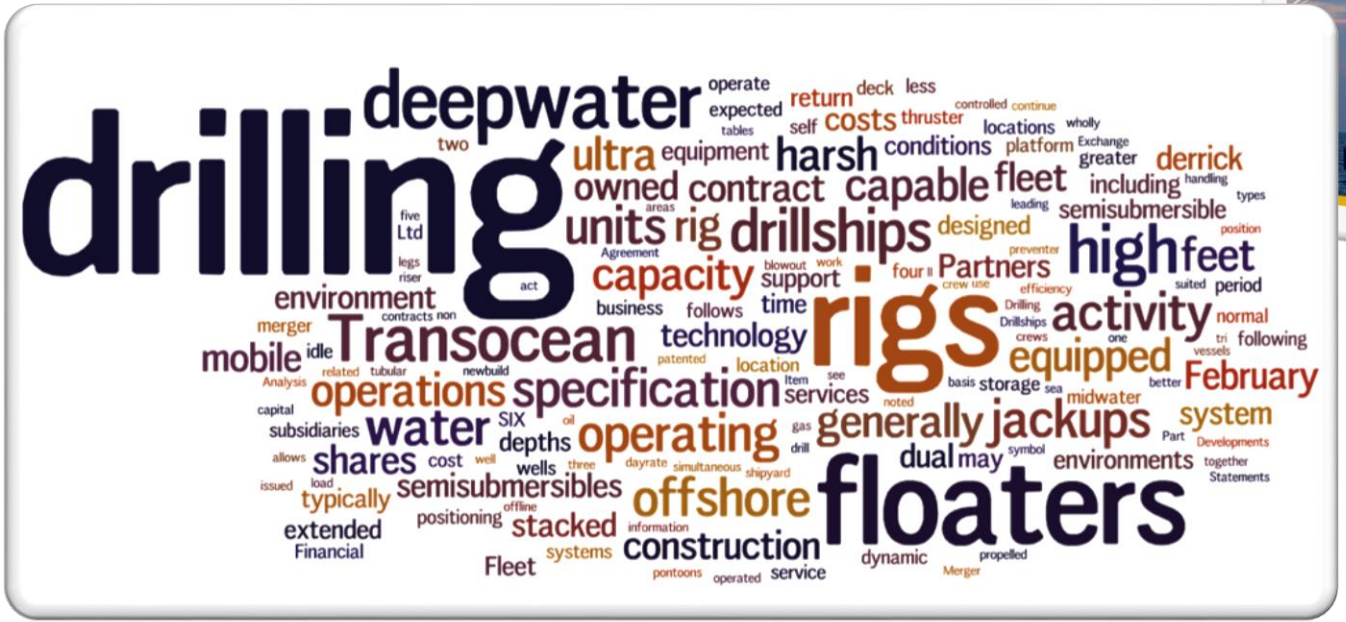

OSIsoft.

**Jose A. Gutierrez, Ph.D.**

**October 4th 2017**

# Agenda


Reliability
Millions of Streams
Real-time
Visualization
CBM
Scalability
Asset Framework
PI System
Analytics
Quality
IoT
Connectivity
Sensor-based Data
Big Data
Infrastructure
High Speed
Business Transformation
Security
Connected Services
Operational Intelligence
Regulatory Compliance
Enterprise Agreement
Business Impact
Enterprise
Process
Operational Efficiency
Time Series
Event Frames
Future Data
Energy Management
Streaming Data
Open System
Asset Health
Safety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Transocean
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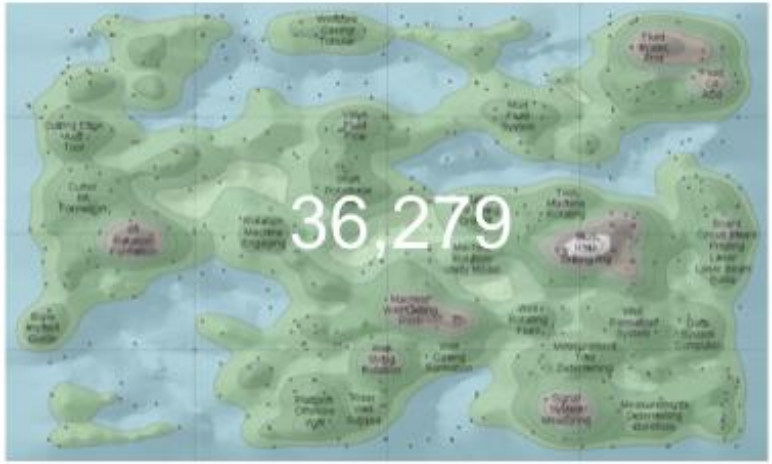
Transocean

# On Digital Transformation in Offshore Drilling

Offshore Drilling Patents
Unique Patent Families Worldwide

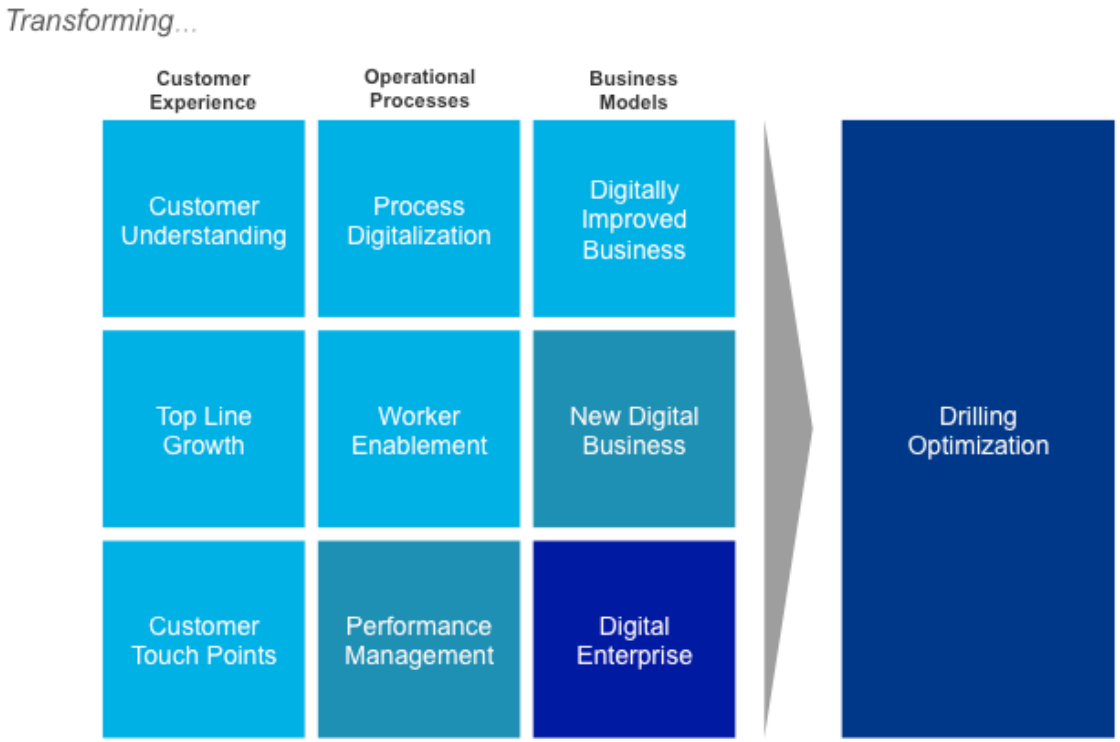



1945-2012

Telecommunication Patents
Unique Patent Families Worldwide


2014

# A Digital Transformation Journey toward Drilling Optimization



# Why is this Journey is 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

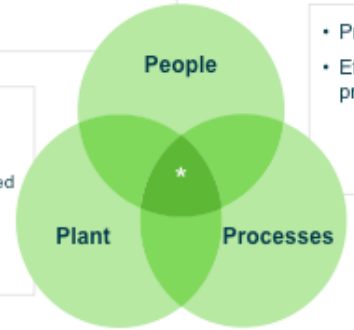
# Challenges in Drilling Optimization

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**

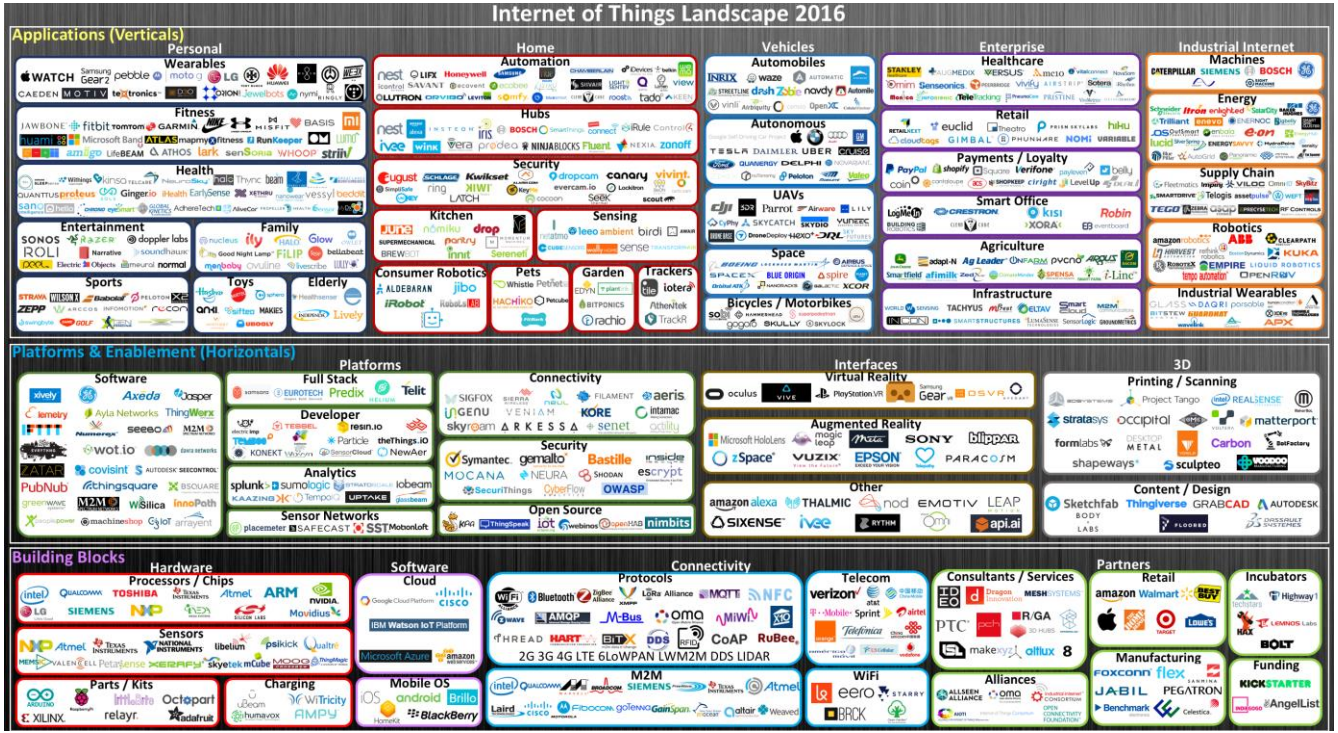
- Too many platforms competing for attention… … too many solutions looking for a problem
- Novel business models trying to position themselves to provide value-added services based on knowledge harvested.
- Lack of understanding of analytic needs

**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*

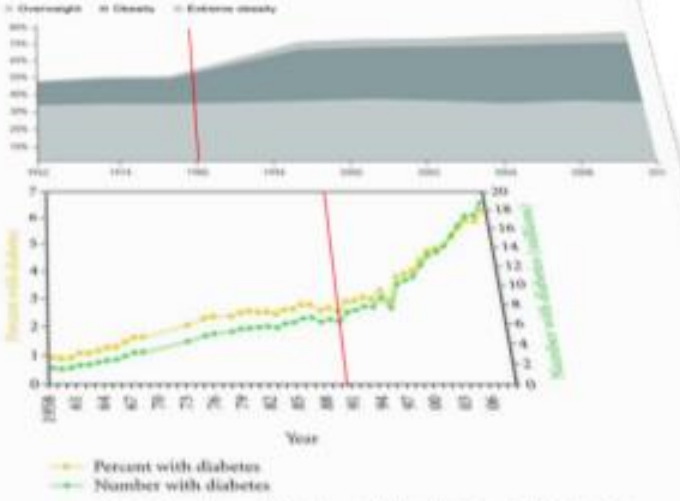


# Big Data Challenges

*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

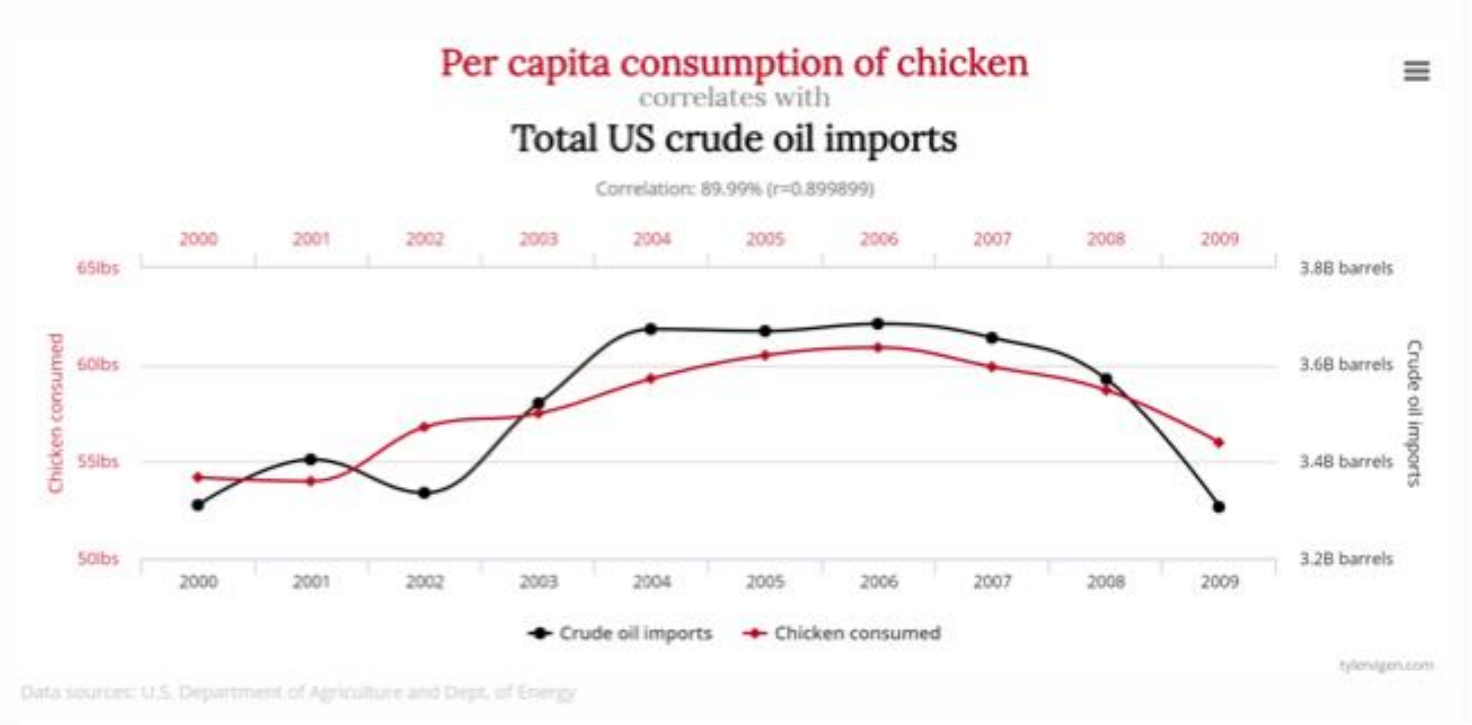



CDC (top) and National Institute of Diabetes and Digestive and Kidney Diseases

luxresearch

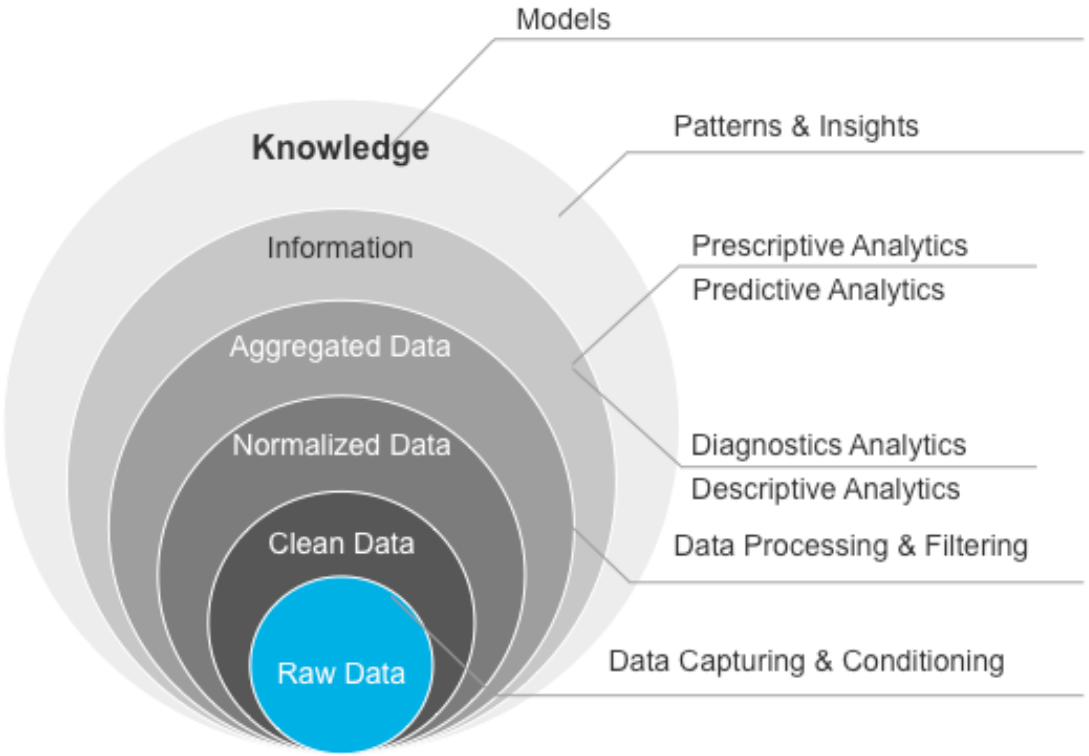
# Analytics Challenges

*Correlation is not causation….*

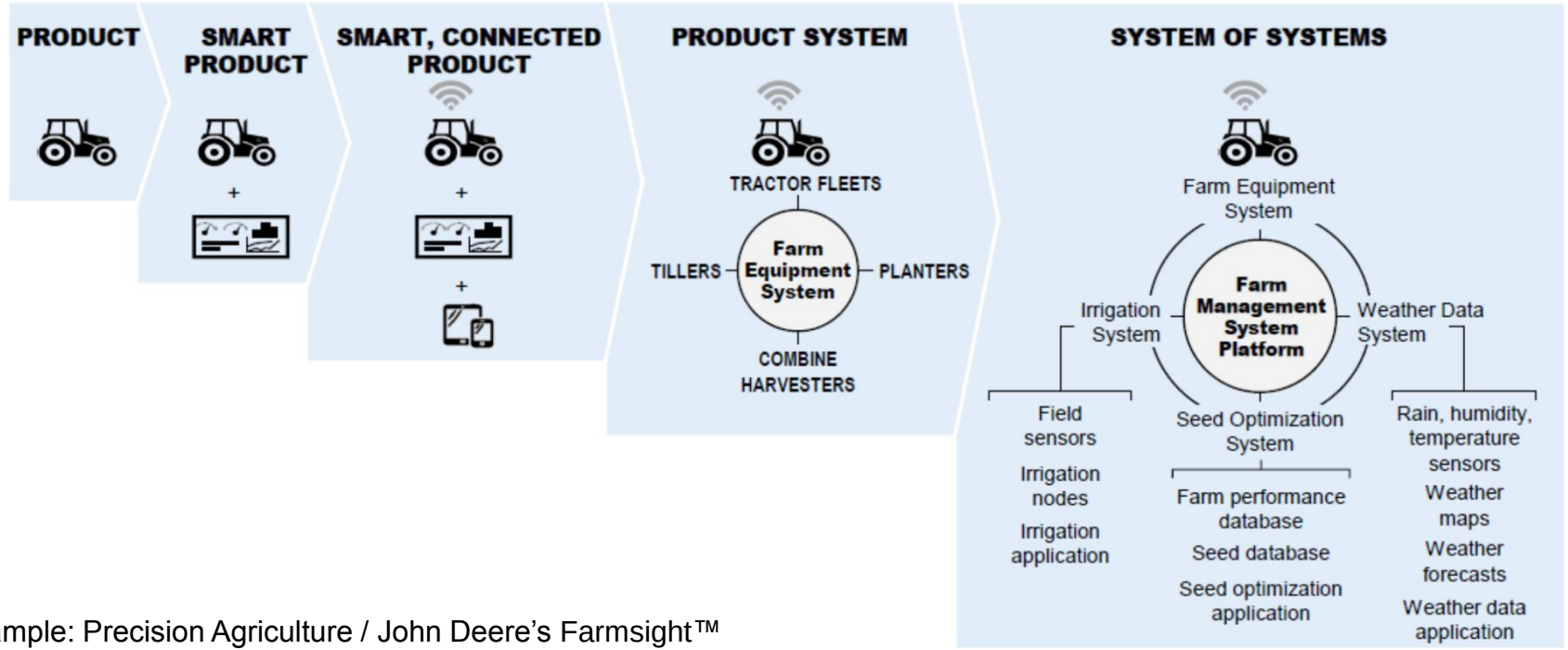


# Creating Value with Data

A business decision framework leveraging smart, connected products



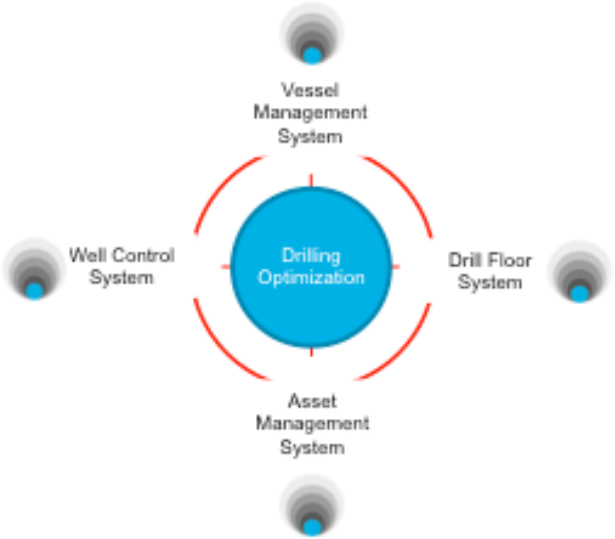
# Expanding Industry Boundaries




Example: Precision Agriculture / John Deere's Farmsight™

# Putting it all together

A Systems of Systems Approach

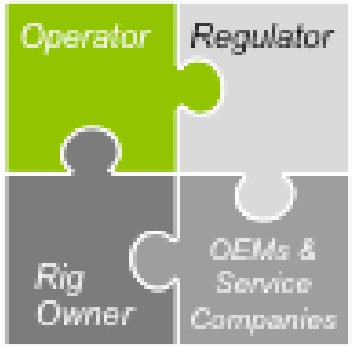




*Business Strategy driving the Digital Transformation*

# 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.



# My appreciation to the OSI Team

*Particularly to Miss Louisiana Jazzland 2004*

# Contact Information

**José A. Gutierrez, Ph.D.** | Director, Technology and Innovation
**Transocean** | 4 Greenway Plaza | Houston, TX  77046  USA
jose.gutierrez@deepwater.com