Navigating Uncertainty with a New Digital Industrial Model

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WHAT WILL DATA AND SOFTWARE MEAN FOR THE FUTURE OF OUR INDUSTRY
Global trends...extraordinary times

3B
Growth in global population by 2050

65%
Growth in global gas demand from 2010 to 2040

50%
Of demand for natural gas will be met by LNG imports or local production of unconventional gas by 2040

40+
Year aging infrastructure in many markets

Demand for energy will continue to rise despite current volatility

EXXONMOBIL - The Outlook for Energy: A View to 2040

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With critical industry challenges

- Price Volatility
- Workforce Turnover
- Operational Islands
- Safety Risks
Navigating Uncertainty in the Digital Era

**INDUSTRIAL INTERNET**
- Domain Knowledge
- Advanced Analytics
- Software Platform (Predix)

**ADVANCED MANUFACTURING**
- Design Innovation
- Manufacturing Innovation
- Materials Innovation

- Industrial data growing at 2x other data
- Most complex data set
- New paradigm = manufacturing technology + material innovation
- Digital thread

**OPEN INNOVATION WITH CUSTOMERS & COLLABORATION ECOSYSTEM**
... Technology Acceleration
This is the Digital Industrial Revolution

The Industrial Internet is a deep meshing of the digital world with the world of equipment and machines. It is enabled by advanced computing, data analytics, low-cost sensing and new levels of connectivity, all permitted by the internet.

WHAT HAPPENED WHEN 1B PEOPLE BECAME CONNECTED?
Redefining business models:
Ads | Entertainment | Retail

WHAT HAPPENS WHEN 50B MACHINES BECOME CONNECTED?
Redefining productivity
Employees | Assets | Systems

CONSUMER INTERNET

INDUSTRIAL INTERNET

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GE’s Predix
The software platform for the Industrial Internet

Machine Centric
Connect, make machines intelligent, and optimize them from anywhere in the network

Industrial Big Data
Optimized for real-time, large-scale analytic and asset management

Modern Architecture
Rapidly deliver consumer grade industrial Internet apps with a cloud-agnostic platform

Resilient & Secure
Protect industrial data and control access to machines, networks and systems

Operational Technology (OT) leaders: underserved by today’s IT platforms
What does it mean for Oil & Gas?

\[ \Delta s = \frac{v^2(t) - v_0^2}{2a_t} \]

\[ 2a_t = \frac{\Delta t'}{\sqrt{1 - \beta^2}} - \int_{r_0}^{r} F \cdot dr + \mathcal{M} \]

\[ x' = \frac{\sqrt{1 - \left(\frac{v_0}{c}\right)^2} - \left(1 - \frac{v_0}{c}\right)^2}{2\pi} \]

\[ T = \frac{2\pi}{\omega} = \int_{i=1}^{N} \sum M_i r_i^2 \frac{dU}{dx} = -F(x) \]

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REAL SOLUTIONS IN USE TODAY IN THE REGION
The GE Global Oil & Gas Technology Center

130 technical professionals
$125MM investment
Summer 2016 completion date
9th global research site
Locally designed and locally built
An office built around a lab

"GETTING DEEP INTO THE ROCK"
Technology and service solutions across the industry

Connecting innovative technology to help you deliver energy to the world

GE’s drilling offerings include exceptional equipment backed by expert support

Helping operators address the challenges of deep waters & harsh environments

Protecting your plant to compete with regulatory & environmental challenges

Moving oil and natural gas, with innovative pipeline and storage solutions

Driving increased performance across your entire LNG process

BRINGING TOGETHER THE DIGITAL AND PHYSICAL WORLDS

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