

# Highlights Oil & Gas Theme

Q2\_2017

## BP

Internet of Everything Broad Themes	Highlights this Period
Internet of Things (e.g. wearable's, connected devices, sensors in things)	<ul style="list-style-type: none"> <li>• BP is using a system known as distributed acoustic sensing, based on a fibre-optic cable placed inside the well at the sand face</li> <li>• Independent Simultaneous Source (ISS) is new 3D survey technology</li> </ul>
Sensor Networks (connected environments)	<ul style="list-style-type: none"> <li>• BP is using Self Verification app for employees</li> </ul>
Augmented Reality	<ul style="list-style-type: none"> <li>• BP staff and contractors can simulate the specific conditions of a drilling operation</li> </ul>
Artificial Intelligence	<p>“Using AI processes, known as algorithms, we’ll be able to combine datasets about areas such as flow rates and pressures and equipment vibration with data from the natural environment, such as seismic information and ocean wave height, to transform the way we run and optimize our operations.” “AI is enabling the fourth industrial revolution and it has the potential to help deliver the next level of performance.”</p>
Drones	<ul style="list-style-type: none"> <li>• Unmanned Aerial Vehicles (UAVs) is helping BP to manage necessary tasks</li> </ul>
Robotics	<ul style="list-style-type: none"> <li>• BP is testing Marine Autonomous Systems (MAS), include both autonomous surface vehicles (ASVs) and autonomous underwater vehicles (AUVs), is helping BP to explore remote offshore operating environments</li> </ul>
Virtual Reality	<ul style="list-style-type: none"> <li>• BP is using virtual reality to help emergency team get a better sense of the scenarios they may face</li> </ul>
Adaptive Manufacturing (3D Printing)	
Blockchain/ Crypto-currency	
(other)	<ul style="list-style-type: none"> <li>• BP partnered with GE for new digital solution (built on GE’s Predix operating system)</li> </ul>

## Chevron

Internet of Everything Broad Themes	Highlights this Period
Internet of Things (e.g. wearable's, connected devices, sensors in things)	Chevron uses Locus Technologies' Environmental Information Management (EIM) solution under a SaaS model to organize and manage laboratory data for environmental remediation projects.
Sensor Networks (connected environments)	Replacing legacy field monitoring equipment at production facilities with new wireless sensor
Augmented Reality	
Artificial Intelligence	Chevron is currently using AI to identify new well locations and stimulation candidates in California.
Drones	In Europe, Chevron has used unmanned aerial vehicles to visually inspect flare tips on the Alba and Captain platforms in the North Sea.
Robotics	Invested in Petrobot project
Virtual Reality	Using VR to get 3D visualization of the sites
Adaptive Manufacturing (3D Printing)	
Blockchain/ Crypto-currency	
(other)	

Note: Questions about Piercing View research themes & focus areas ?

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We would be glad to review our approach and methodology.

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## Hess Corp

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Internet of Things (e.g. wearable's, connected devices, sensors in things)	<ul style="list-style-type: none"> <li>Accenture and Hess will work on planning, design and implementation of a technology solution that links field assets to a network of cloud-based offerings</li> <li>Hess implemented Zimt Apps for oil-field workers.</li> </ul>
Sensor Networks (connected environments)	
Augmented Reality	
Artificial Intelligence	
Drones	
Robotics	
Virtual Reality	
Adaptive Manufacturing (3D Printing)	
Blockchain/ Crypto-currency	
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## Royal Dutch Shell

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Internet of Things (e.g. wearable's, connected devices, sensors in things)	<ul style="list-style-type: none"> <li>• Shell install IoT sensors over its 80 oilfields in the western African nation</li> <li>• Shell developed a pipe-tripping solution that combines vision sensor technology</li> </ul>
Sensor Networks (connected environments)	<ul style="list-style-type: none"> <li>• Innoseis's prototype seismic sensor</li> <li>• Shell uses fiber optic cables has sensors</li> </ul>
Augmented Reality	
Artificial Intelligence	<ul style="list-style-type: none"> <li>• Launched artificial intelligence-driven service for customers in lubricants industry</li> </ul>
Drones	<ul style="list-style-type: none"> <li>• Shell is using remotely operated aerial vehicles (ROAVs)</li> <li>• Shell has used Wave Gliders</li> </ul>
Robotics	<ul style="list-style-type: none"> <li>• Shell launched Sensabot, the first resident mobile robot</li> <li>• Shell is also using robotic viscosity measurement for chemical EOR</li> </ul>
Virtual Reality	<ul style="list-style-type: none"> <li>• Shell employees use smart safety glass in lab</li> </ul>
Adaptive Manufacturing (3D Printing)	<ul style="list-style-type: none"> <li>• Shell Uses 3D printed prototype for very complex planning</li> </ul>
Blockchain/ Crypto-currency	
(other)	<ul style="list-style-type: none"> <li>• Shell is using HANA and Sharepoints</li> </ul>

Jonathan Crane, vice-president of wells technology deployment and service, - *“The internet of things is upon us, and it's an exciting space for Shell. We have many more ideas than we have the capacity to deliver at the moment, and it's one of the few times that we've had so much running room ahead of us. The data platform we've created - that's the direction we see the industry going, and Shell expects to see this type of innovation entering the business quickly.”*

## Repsol

Internet of Everything Broad Themes	Highlights this Period
Internet of Things (e.g. wearable's, connected devices, sensors in things)	<ul style="list-style-type: none"> <li>• Repsol and IBM is working on a collaborative research programme linking digital cognition technology</li> </ul>
Sensor Networks (connected environments)	<ul style="list-style-type: none"> <li>• Repsol has launched a mobile application in Spain to pay for fuel</li> <li>• With 24,000 employees in 39 countries, Repsol offer simple, secure access to its cloud applications</li> </ul>
Augmented Reality	
Artificial Intelligence	
Drones	<ul style="list-style-type: none"> <li>• Repsol had successfully completed its first drone trial</li> </ul>
Robotics	<ul style="list-style-type: none"> <li>• The biologists at Repsol is using robot for biological tests</li> </ul>
Virtual Reality	<ul style="list-style-type: none"> <li>• Raepsol is using virtual reality technology</li> </ul>
Adaptive Manufacturing (3D Printing)	<ul style="list-style-type: none"> <li>• Repsol funded Spanish tech company Oxolutia for Solar Oxides</li> </ul>
Blockchain/ Crypto-currency	
(other)	

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## Statoil

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Internet of Things (e.g. wearable's, connected devices, sensors in things)	<ul style="list-style-type: none"> <li>✓ Company used Honeywell Process Solutions (HPS) to enable remote onshore operation</li> <li>✓ Company leverages big data for analyzing seismic and reservoir data, real time drilling data and condition-based maintenance</li> </ul>
Sensor Networks (connected environments)	
Augmented Reality	
Artificial Intelligence	
Drones	The company availed Drone services from Cyber Hawk and Sky Futures
Robotics	Statoil invested in Eelume, a company manufacturing Swimming ROVs
Virtual Reality	Statoil rolled out virtualized desktops with graphics acceleration powered by NVIDIA GRID
Adaptive Manufacturing (3D Printing)	
Blockchain/ Crypto-currency	
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## Total

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Internet of Things (e.g. wearable's, connected devices, sensors in things)	"Plant 4.0" Corporate Incubator - Total announced to launch "Plant 4.0" corporate incubator to support deployment of digital technologies in its industrial activities.
Sensor Networks (connected environments)	
Augmented Reality	
Artificial Intelligence	
Drones	Total is developing a new drone with capabilities to assist in search & rescue, environmental protection, and rig safety.
Robotics	Total SA used LROG robotics technologies (Wave glider) to characterize ocean currents off the coast of South America prior to deploying seismic surveying equipment there
Virtual Reality	"Plant 4.0" Corporate Incubator - Total announced to launch "Plant 4.0" corporate incubator to support deployment of digital technologies in its industrial activities.
Adaptive Manufacturing (3D Printing)	
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## ExxonMobil

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Internet of Things (e.g. wearable's, connected devices, sensors in things)	ExxonMobil Launches Speedpass+ Mobile Payment App with Apple Pay
Sensor Networks (connected environments)	ExxonMobil developed IntelliRed, a sophisticated computer algorithm integrated with an infrared-based optical gas imager that provides a highly sensitive and accurate early warning of leaks.
Augmented Reality	
Artificial Intelligence	ExxonMobil to join up with IBM and GM on their new venture, OnStar Go to use IBM artificial intelligence to market services to drivers
Drones	Exxon using drones for research project of tracking whales.
Robotics	
Virtual Reality	ExxonMobil partners with EON Reality Inc for the Immersive 3D Operator Training Simulator technology
Adaptive Manufacturing (3D Printing)	
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