



India | New Delhi

## Parallel Roundtable 3: Energy Sector Digitalization; Benefits and Challenges

### Background Paper



# Disclaimer

The observations presented herein are meant as background for the dialogue at the 16<sup>th</sup> International Energy Forum. They have been prepared in collaboration with The Boston Consulting Group and should not be interpreted as the opinion of the International Energy Forum or The Boston Consulting Group on any given subject.

# Introduction

## Market Context

- Industries are going through a digital revolution that has started to reshape each and every one of it
- Though digital is at a nascent stage in O&G industry, players are developing sophisticated initiatives in digital space
- Digital is significant in India and will go beyond 3Ms - males, millennials and metro



## Session Objectives

- To understand relevance and scope of digital technology across industries
- To assess relevance of digital in India and what be future drivers of its growth in the country
- To observe themes driving digital investments across O&G industry and how some of the majors are deploying and benefitting from it

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**Key Question:** How is digitalisation making oil, gas and power sectors more efficient and resilient? What is the role of inventory data, will stocks become more transparent in the digital age?

# Digital is a “tremendous rate of change” with an ubiquitous front end



By 2030, the cloud will have more raw computing power than all human brains together



2X growth in connected devices per household—25 (2017) to 50 (2020)



1 internet minute means



0.9Mn logins



156Mn emails



\$0.7Mn spent



4 billion of the world’s internet users, will spend a staggering 1 billion years online in 2018

# Digitization has started to re-shape the complete industrial world

## Industrial Internet

- Tracking (location & temperature) of refrigerated shipping container



## Big Data & Analytics

- Gene sequencing for agricultural production



## Mobile & social

- Advanced mobile service assistance



## Cloud

- SaaS based process engineering tools



## Augmented reality

- AR-based assistance in warehousing



## Simulation

- 3D real-time factory simulation for design and monitoring



## Cyber security

- Industrial cyber security for process industries



## Horizontal & vertical integration

- Plant engineering integrated with process control system



## Additive manufacturing

- 3D-printed fuel nozzles in the combustion system



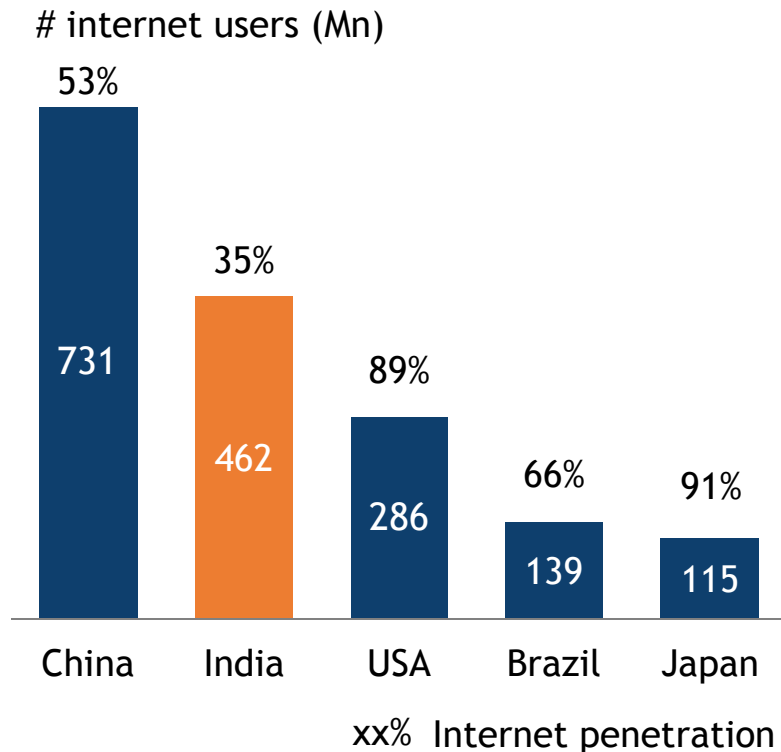
## Autonomous robots

- Human collaborative robots working side-by-side with workers



# Digital in India is already significant and will continue to grow

India today has the 2<sup>nd</sup> largest base of internet users in the world



Internet users to further increase, driven by the rise in smartphone use

**650 Mn** > Internet users in India in 2020

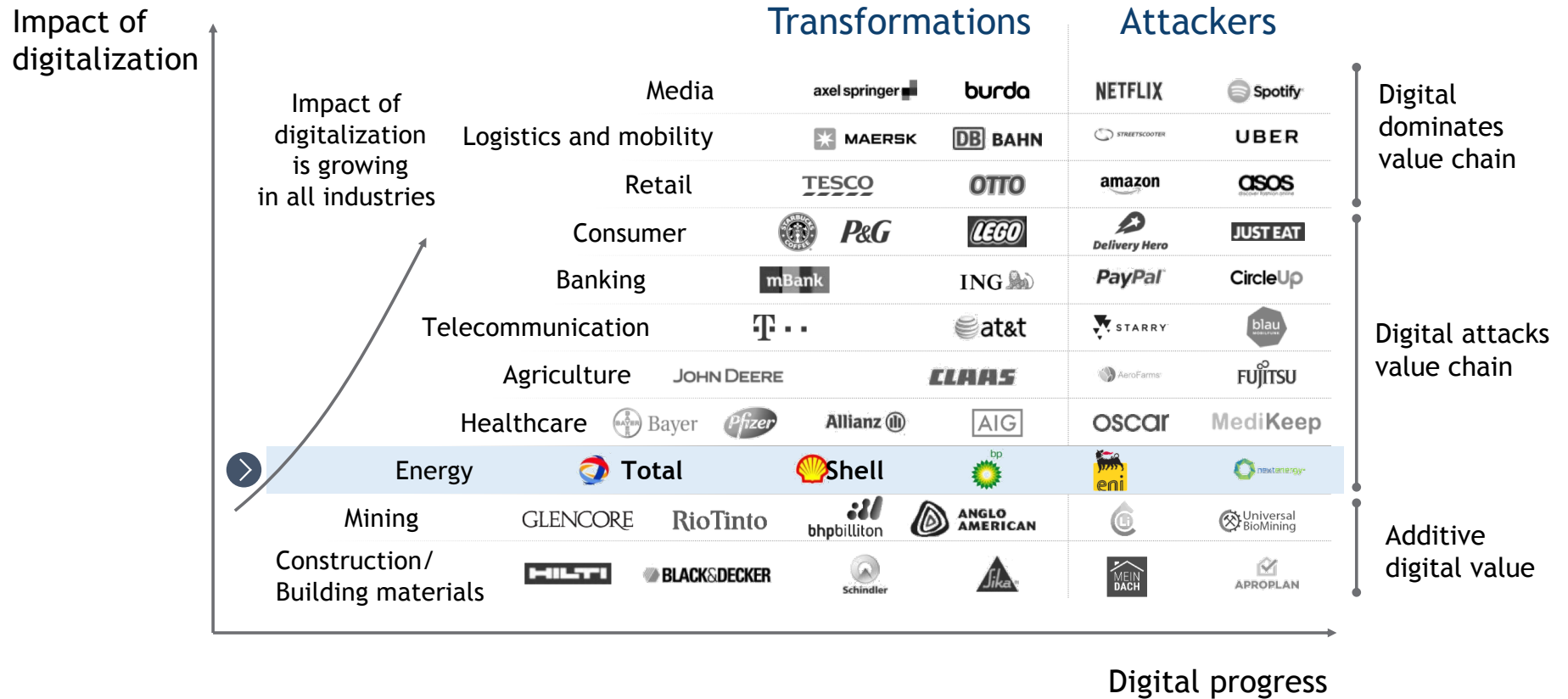
**80%** > Users to access internet from phones v/s 70% today

**13%** > Growth in Indian smartphone market vis-à-vis 3% globally

# Digital to go beyond 3M's—males, millennials, metro

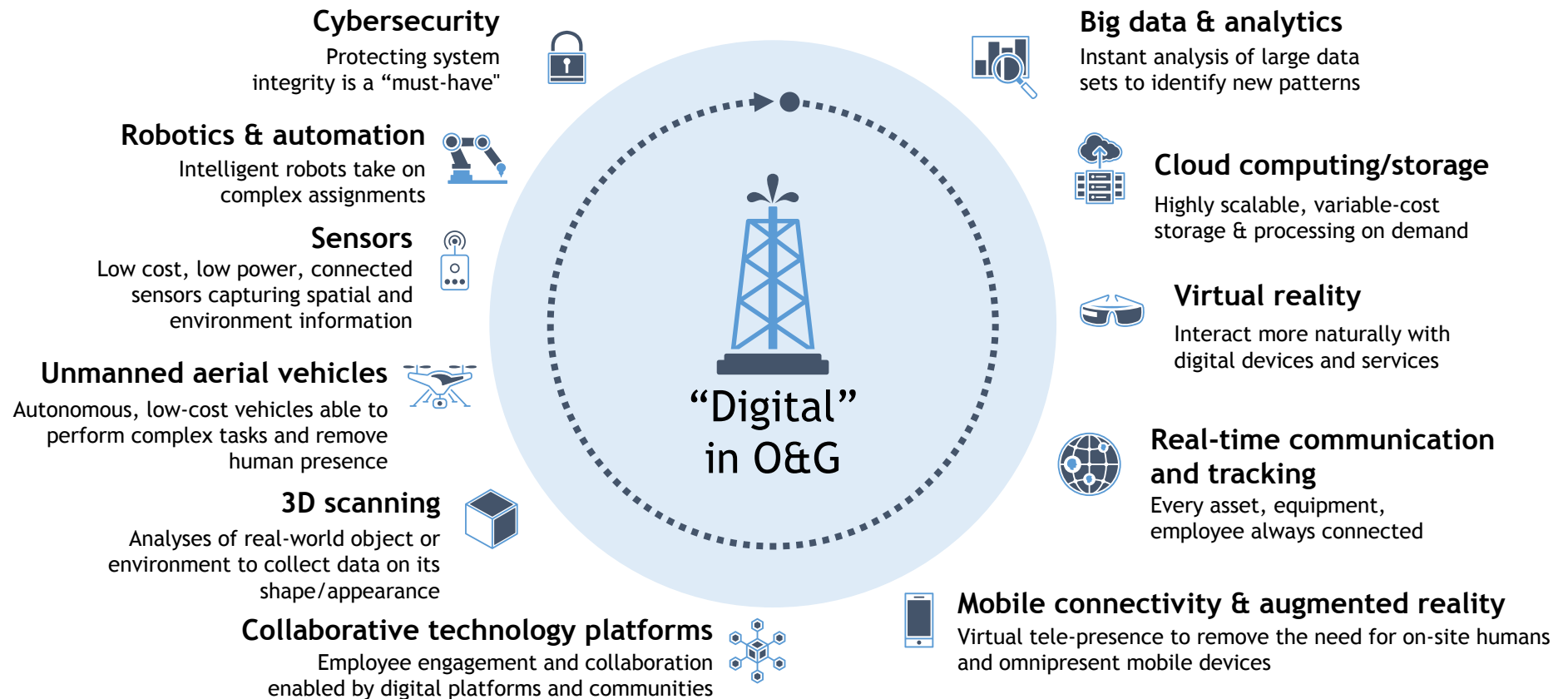
	Segment	2016 (Mn)	2020 (Mn)	Δ
People who we think use internet in India...	Millenials (<34 Yrs)	244	436	1.8
	Male	231	390	1.7
	Metro/T1	96	150	1.6
... but many others beyond the stereotype are online	Not So Young (35+ Yrs)	86	214	2.5
	Female	99	260	2.6
	Non-metro	234	500	2.2

# Digital is still nascent in Oil and Gas but could cause significant disruption





# “Digital” in O&G: 11 themes are driving innovation in leading global companies



# Oil & Gas players are already developing sophisticated initiatives in the digital space

Illustrative



**Digital oilfields** controlled from a unique Real-Time Drilling Optimization Center  
UAV for pipeline inspections



**Analytics driven predictive maintenance**  
Digital initiatives in retail (customer segmentation and loyalty)

**ExxonMobil**

**Submersible robot** for Ocean exploration  
Immersive 3D training simulation



**Real time production optimization** through big data and machine learning

# Digital oilfields controlled from a unique Real-Time Drilling Optimization Center



## Description

Provides 360 degrees, 24/7 monitoring of live data, including most complex wells

Interact as virtual extension of rig and business unit-based teams

Supporting performance improvement in multi-well operations and process safety in wells

## Technology



Big Data



Collaborative technology platforms

## Benefits

- Faster communications and collaboration
- Quicker, better decisions and improved drilling performance
- Safer and more efficient operations

# Analytics driven predictive maintenance with real-time data integration across all platforms



## Description

650 wells connected to Industrial Internet across Alaska, Angola and North Sea

Integrates operational data from producing oil and gas facilities, to deliver notifications and analytical reports to upfront identify operational performance issues

Leverages GE's Asset Performance Management (APM), Predix and Plant Operations Advisor (POA) platforms

## Technology



Big Data



Real-time communication & tracking

## Benefits

- >\$200 M annual cost savings
- Estimated efficiency improvement of 2-4%
- Reduced supply chain costs

# Submersible robot for Ocean mapping for exploration



## Description

MIT and ExxonMobil are working together to create a self-learning, submersible robot for ocean exploration

- Operates autonomously in all marine conditions
- Collects and analyzes ocean exploration data
- Learns from experience and needs minimal intervention

## Technology



Sensors



Advanced Robotics

## Benefits

- Safer and cheaper ocean mapping and surveillance
- Can detect and analyze naturally seeping hydrocarbons

# Real time production optimization through big data and machine learning



## Description

FieldPulse software can seamlessly integrate massive amounts of data from multiple sources (Well production data, testing, metadata like operator logs)

KPIs (e.g., rate decline and model deviations) constantly monitored

Embedded machine learning models track real-time patterns to improve performance through experience

## Technology



Big Data



Real-time communication & tracking

## Benefits

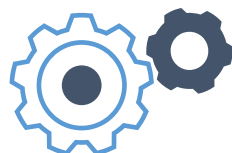
- Optimised field production: 1 Mbbl production gain from 30 wells in 2 years
- Lower manpower cost due to Automated monitoring
- Safer operations

# However, companies are hindered in their “digitalization” by internal roadblocks



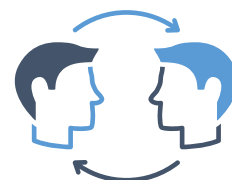
## Digital talent crunch

72% of CEOs struggle to source the right digital talent<sup>1</sup>



## Dated processes

74% high digital decision-makers do not fully agree that their operational process is ready to execute their digital strategy<sup>2</sup>



## Cultural obstacles

“The biggest challenge is cultural change”<sup>3</sup>



## Inadequate investment in digital infrastructure

Only select cos are investing in state of the art digital infrastructure

# Key Questions

- 1 What are some of the most practical areas where digital can help an O&G company in the short term (1 to 3 years)?
- 2 How can one insure smooth infusion of technology into traditional O&G business/companies without disrupting it?
- 3 What are the key challenges of going digital?



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