Digital Leadership Strategy
Super Oil and Gas Company

AMPE Consulting Group

Executive Leadership Council

National Business Case Competition 2020

KELLEY
SCHOOL OF BUSINESS
MBA Program

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Agenda

Embrace

- Executive Summary
- Recommendation
- Background
- Embrace, Revamp, Deploy: The Beginning
- CIO, TMT, and Digital Transformation

Revamp

- Human Capital: Leaders, Culture, and People set the Digital Trajectory

Deploy

- The Technology: Oil & Gas Toolkit
- The Technology: Evolving Quickly through Smart Capital
- The Technology: Customer Engagement
- New Digital Capabilities and Financial Performance

Lead

- Embrace, Revamp, Deploy: The Next Five Years
- Embrace, Revamp, Deploy: The Final Verdict

April 2025, Alexis is the newly appointed Deputy CIO

Digital Transformation is a $150B opportunity for oil & gas

Where?
To evolve quickly

What?
Tools will be used

EMBRACE
REVAMP
DEPLOY

Who?
Will be a part of the new era of innovation

How?
To measure financial performance

Innovating Energy for an Inclusive Future

Embrace | Revamp | Deploy | Lead

Sources: CNBC, Tech and energy are teaming up, creating a market that could grow 500% in the next 5 years

Background: Oil & Gas in 2020

Current Oil & Gas landscape is challenged, but primed for digital transformation

Threats to both supply and demand require new approaches and leadership

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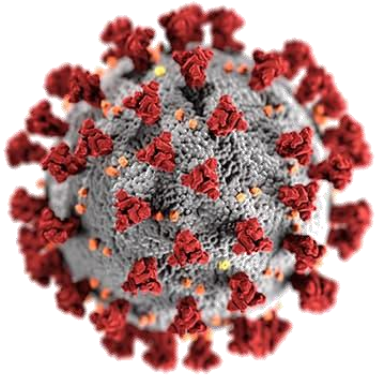

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Embrace | Revamp | Deploy | Lead

Sources: Foreign Policy, World Economic Forum/Accenture analysis, Digital Transformation Initiative: Oil and Gas Industry

Negative perceptions pervade Oil & Gas

+ **“Hire-To-Retire”** =

- Resistant to change
- Lacking Innovation

Gender and Ethnic Diversity combine for a 25% greater financial performance over industry medians

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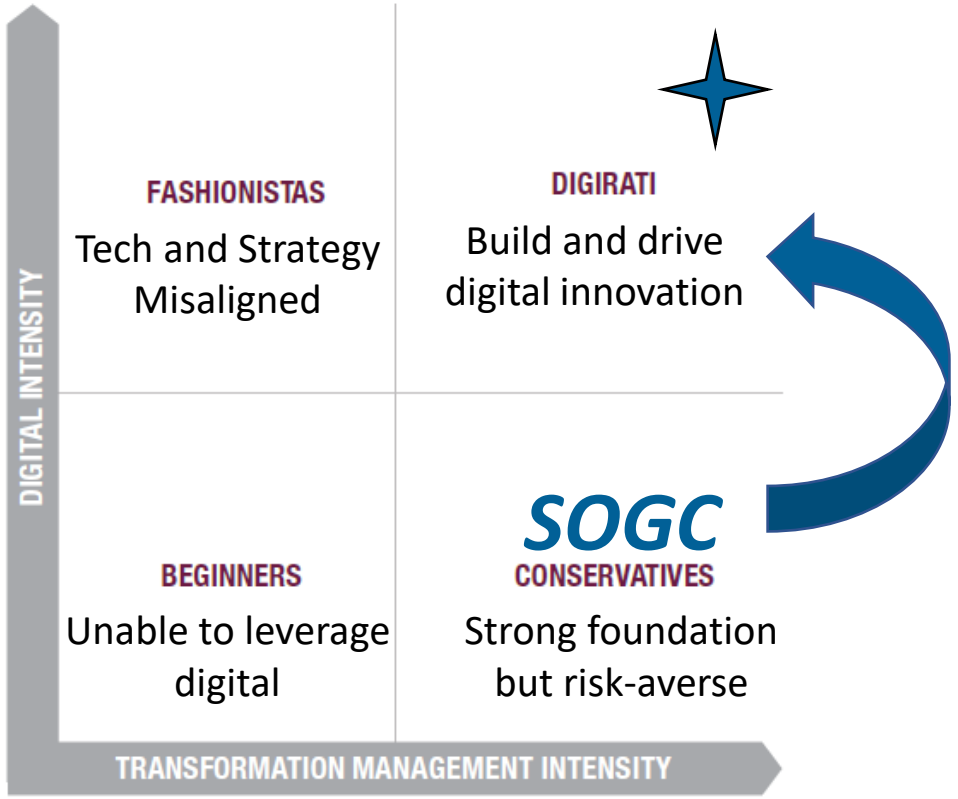
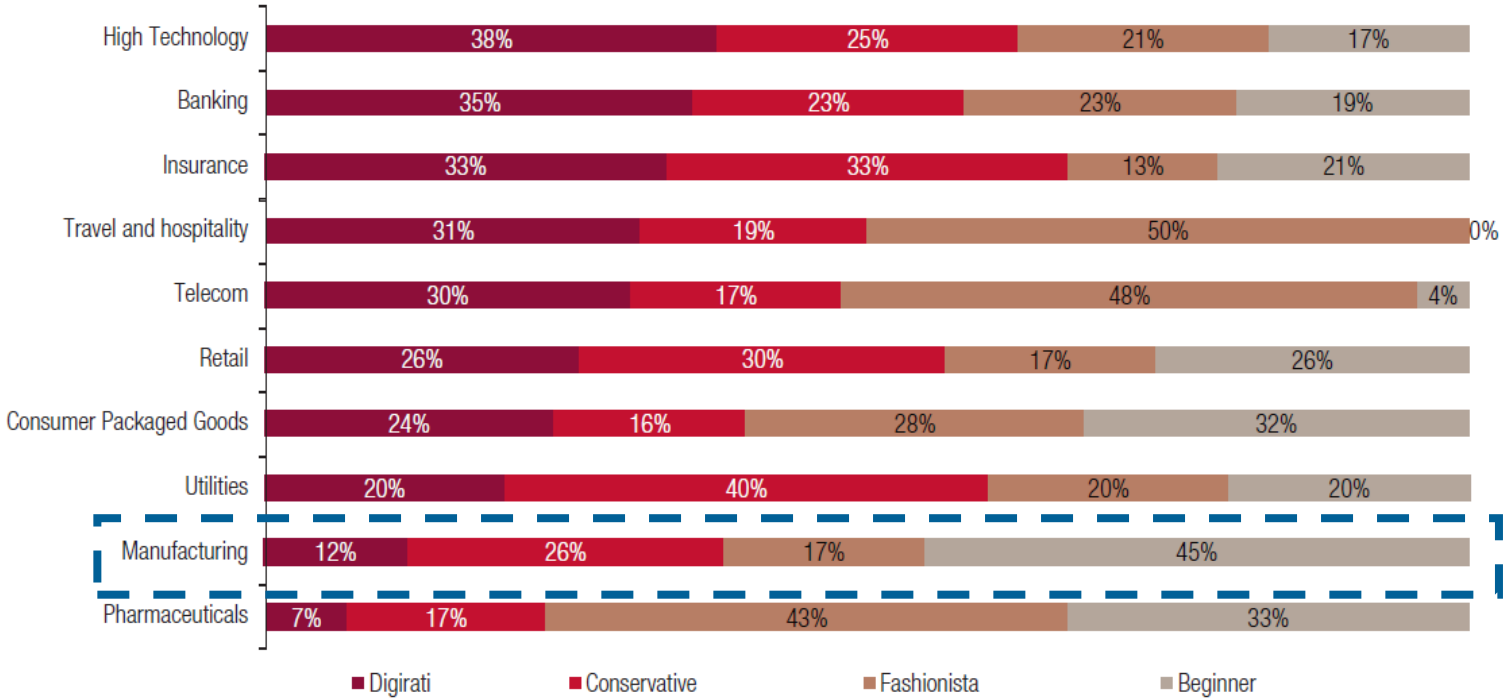
Sources: 2019 U.S. Energy and Employment Report, McKinsey – Why Diversity Matters, AMPE Consulting Group

Meeting business needs with digital transformation





SOGC can become the Oil and Gas Digirati

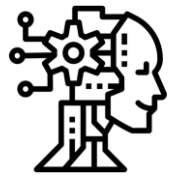
Embrace → Revamp → Deploy → Lead

Sources: MIT Center for Digital Business

Embrace, Revamp, Deploy: The Beginning

People

O&G Toolkit



Customer

YOSHI

Leaders

CIO and TMT

EMBRACE
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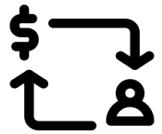
DEPLOY

Performance



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CONSERVATIVE → **DIGIRATI**

Innovating Energy for an Inclusive Future

Embrace | Revamp | Deploy | Lead

Sources: AMPE Consulting Group, March 2020 Report

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Foundational attributes for shared CIO/TMT vision

CIO Relational Capital

Trust between CIO and TMT in order to make effective IT investments

Shared Language of Business

Ability to speak in business terms not IT jargon – MBA/MSIS dual degree

CIO Strategic Knowledge

IT knowledge, strategic knowledge, and competitive knowledge

Revamp the recruiting and retention pipeline in order to execute the shared vision of the Digirati

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Sources: MIS Quarterly Executive

People

Leaders

CIO and TMT

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Target Employee: MBA

Technology Focused

MBA

MBA/MSIS Double Major

Innovative

Leader

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Sources: Oil & Gas Consumer Insights 2020 Survey, McKinsey – Why Diversity Matters, MIT Center for Digital Business

Human Capital – Internal HR Structure of SOGC

Contractors | University Recruiting | Early-Career | MBA Recruiting | Mid-Career | C-Suite

Diversity & Inclusion Recruiters

Create a committee that is diverse and representative of unique talent which will support digital transformation initiatives

Embrace → Revamp → Deploy → Lead

Sources: Oakstone, LA Times

Human Capital – What worked for SOGC?

Outreach & Awareness

Raise awareness of technology transformation taking place within SOGC and how these internal developments will attract top diverse talent

DIVERSITY PROGRAM CONSORTIUM

Average time cycle to hire

To reduce hiring timelines and maintain the quality of diverse candidates within SOGC

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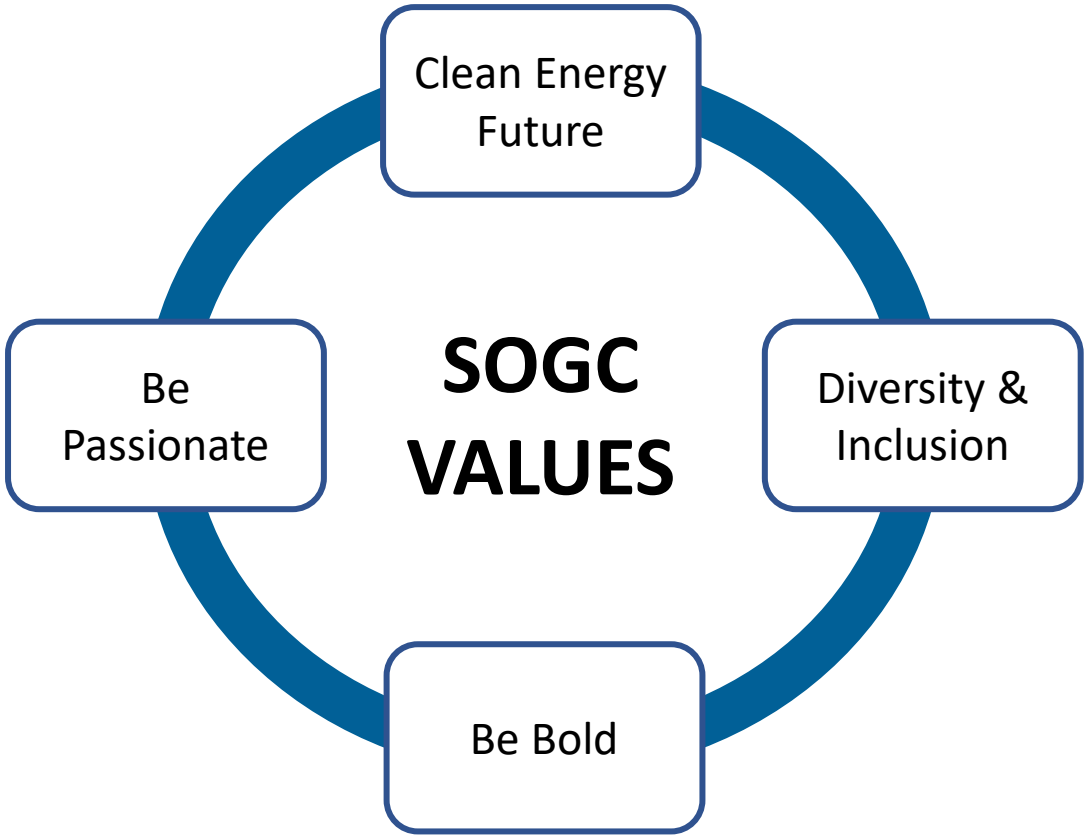
Sources: American Corbanone, Society of Human Resource Management

Human Capital – Revamping the interview process

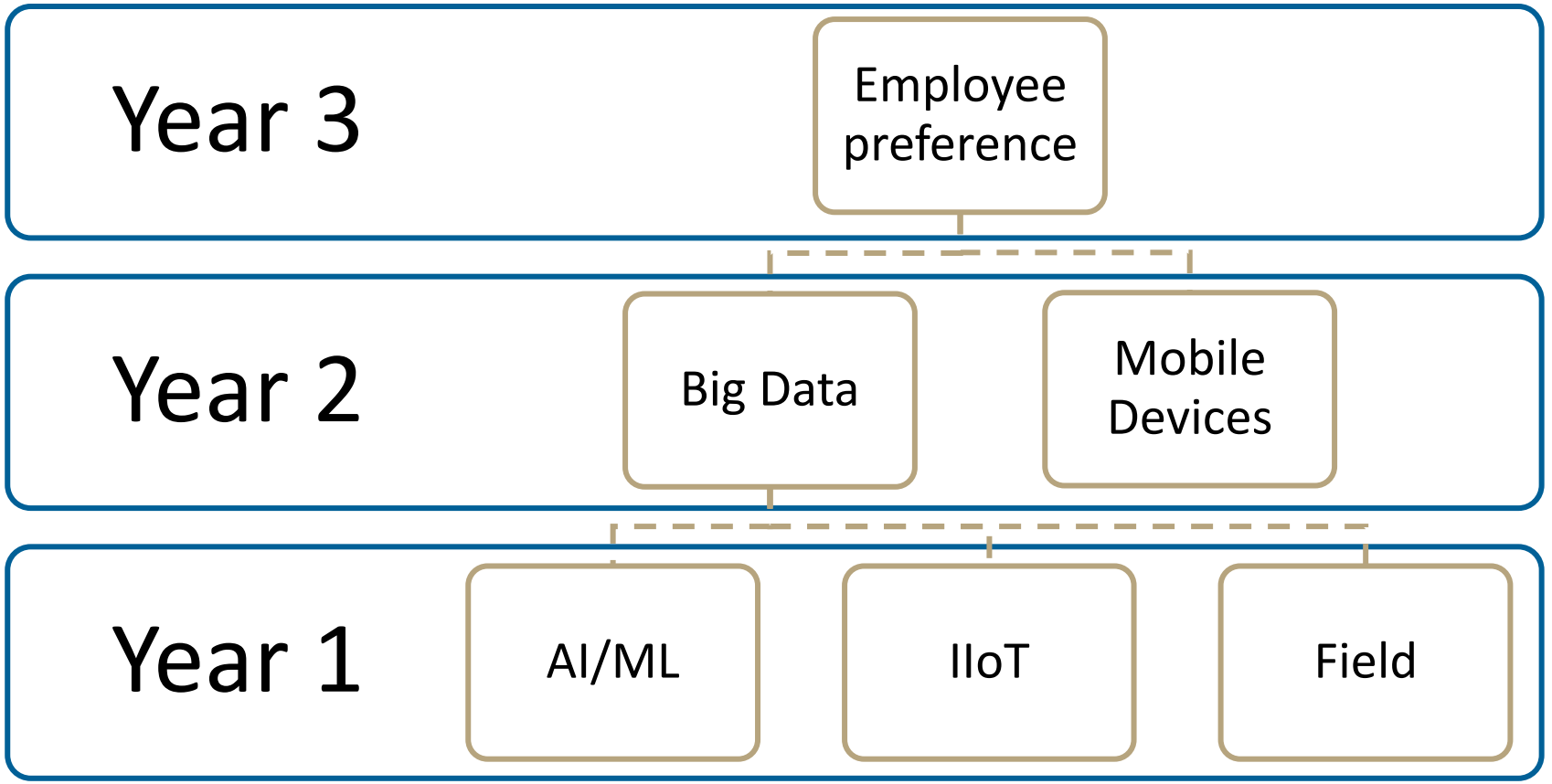


Technical Presentation Skills

Embrace | Revamp | Deploy | Lead

Sources: Society of Human Resource Management

Human Capital – Diversity Leadership Rotational Pipeline

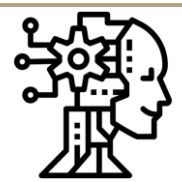


Embrace | Revamp | Deploy | Lead

Sources: Oakstone, LA times, Payscale, Intel, U.S. Census Bureau, Square Space, Oil & Gas Consumer Insights 2020 Survey

People

O&G Toolkit



Leaders

CIO and TMT

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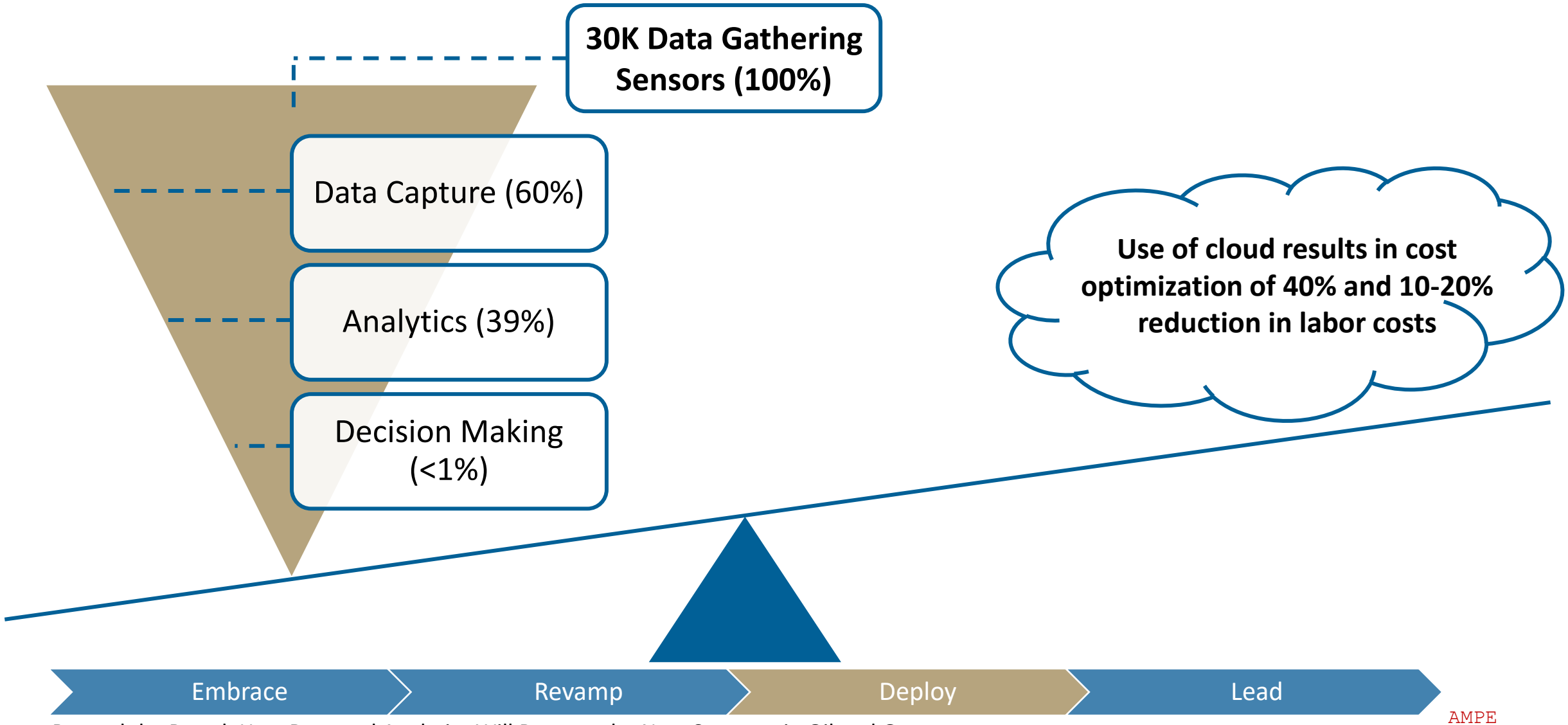
1TB + of daily O&G data, 99% of which sits unused



Sources: Beyond the Barrel: How Data and Analytics Will Become the New Currency in Oil and Gas

The Technology: Oil and Gas Toolkit

AI/ML

- Automation
- Data optimization and pattern recognition
- Skill and expertise retention

Mobile Devices

- Real time data access
- Virtualization implementation
- Improved health, life and safety monitoring

IIoT

- Improved tool & output monitoring and maintenance management
- Reduced Emissions

Big Data/Analytics

- Reduced CapEx spend with enhanced data leverage
- Cross functional skill building opportunities

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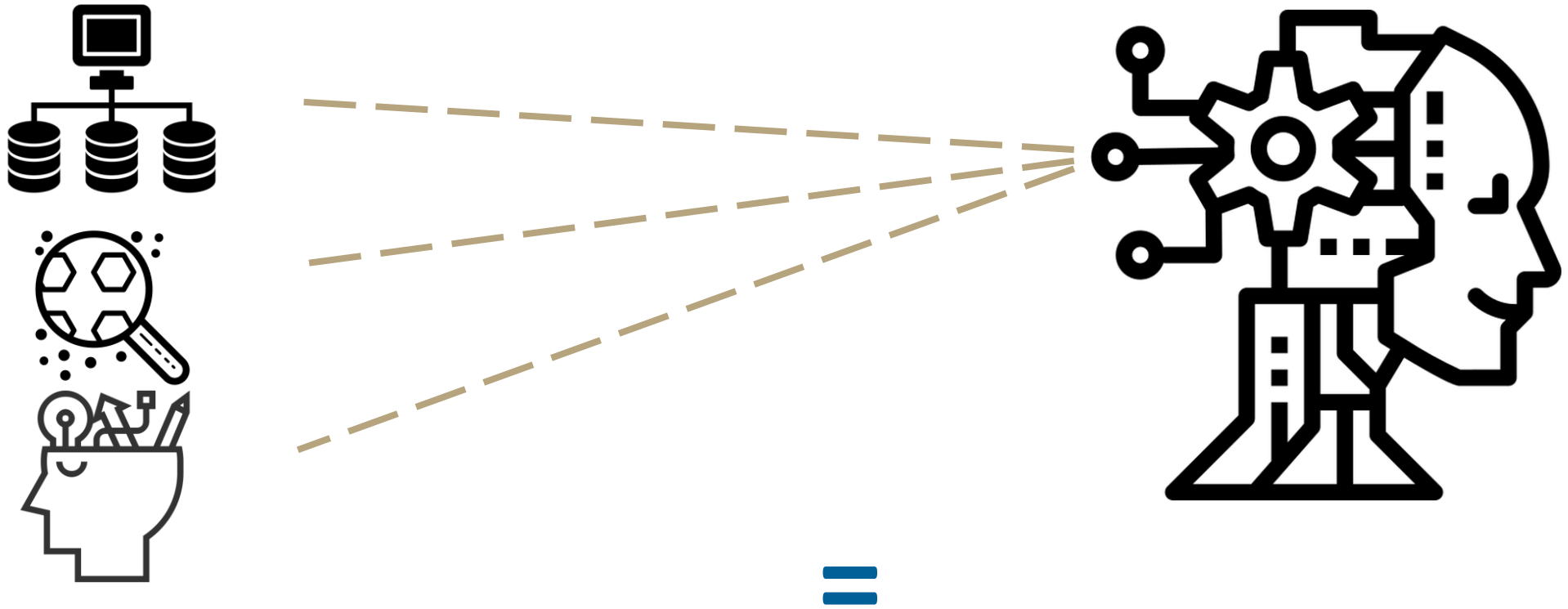
Sources: World Economic Forum January 2017 white paper

The Technology: AI/ML



Automation, Data Optimization, Pattern Recognition & Skill Retention

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Sources: WSJ, Oil and Gas Companies Turn To Ai To Cut Costs Neanda Salvaterra

The Technology: IIoT

Upstream monitoring temperature, pressure, speed and vibration

Midstream monitoring temperature, pressure, heat content and flow rate

Downstream monitoring Carbon, heat content and temperature

=

Enhanced Output, Improved Maintenance & Reduced Emissions

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Sources: AppsTek

The Technology: Mobile Devices



Durable field technology including virtualization hardware and wearables

=

Real Time Data Access, Reduced CapEx via Virtualization & Improved Health, Life and Safety

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Sources: Drager, Oil & Gas Mobile Technology

The Technology: Big Data

Data mined to analyze **volume**, **variety**, **velocity**, **veracity**, **value** and **complexity**

=

Reduced CapEx Spend & New Cross Functional Opportunities

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Sources: Science Direct, Big Data Analytics in Oil & Gas Industry

Evolving Quickly Through Smart Capital

Digital leadership through technology investments which enhance firm outputs and employee opportunities

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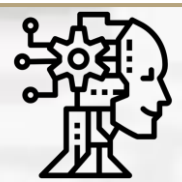
Sources: AMPE Consulting Group, March 2020 Report

People

O&G Toolkit



Customer

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CIO and TMT

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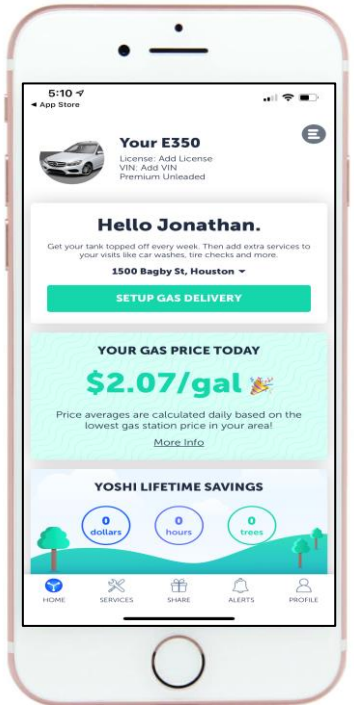
SOGC needs to think "Beyond the Barrel"

Digital Customer Services



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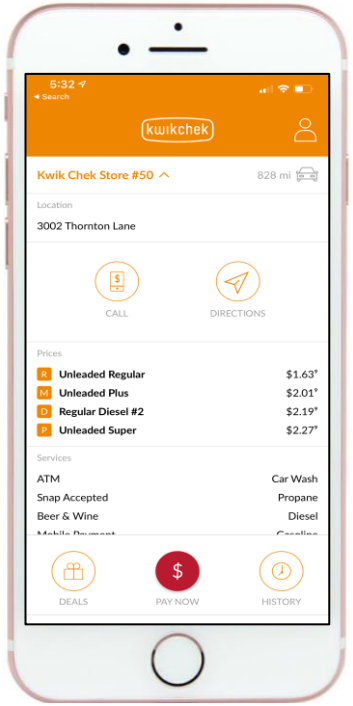
Omnichannel Retail and Experiential Services



Enable operations and customer capabilities to achieve the financial performance of a Digirati

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Sources: World Economic Forum January 2017 white paper

People

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Customer

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Performance

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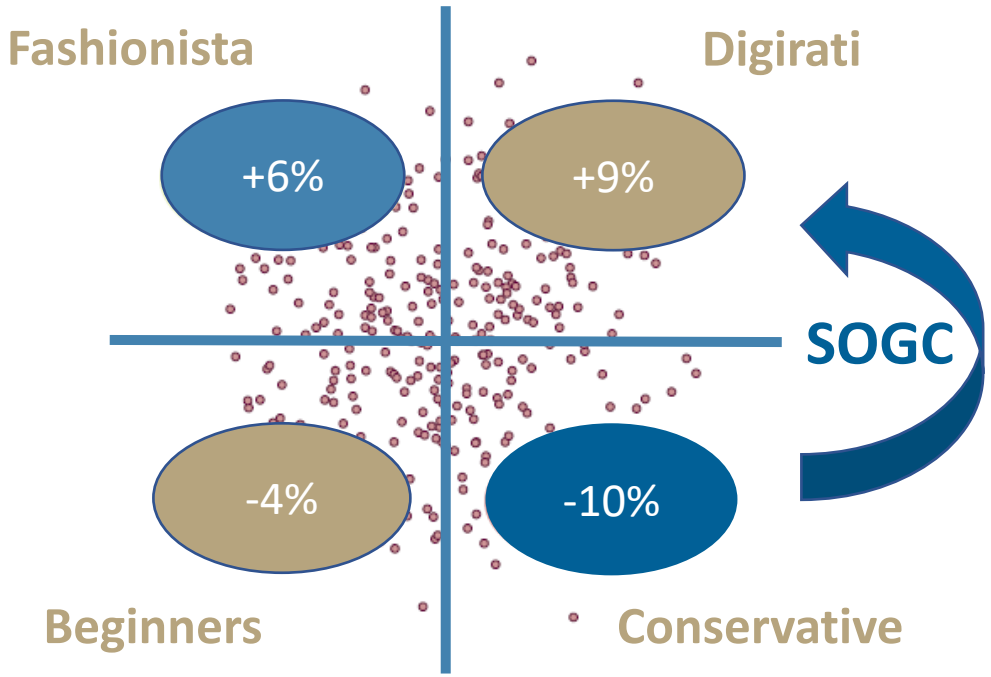
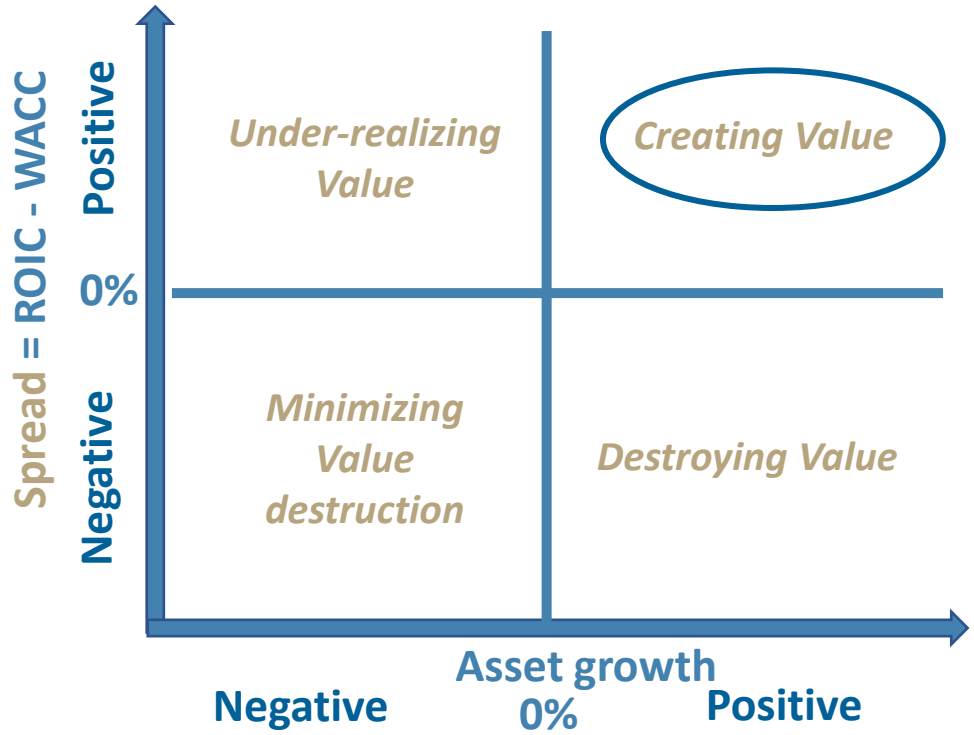
Innovative Energy investment must create long term Value

Revenue Generation from Physical Assets



Value Creation Imperatives



"A truly great business must have an enduring "moat" that protects excellent return on invested capital" Warren Buffet

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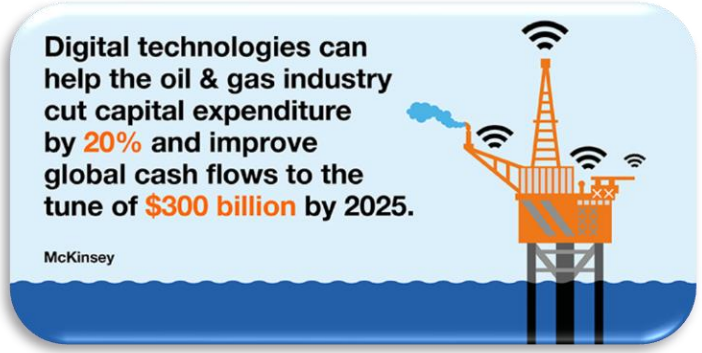
Sources: MIT Center for Digital Business, Warren Buffet, 2007 shareholder letter, AMPE Consulting Group, March 2020 Report

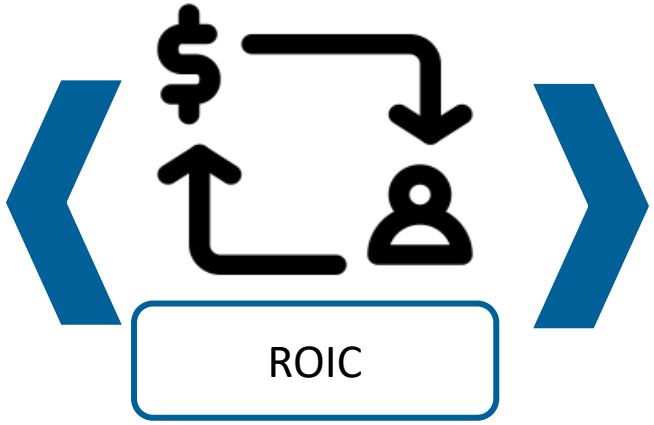
Deploying Smart Capital improves Financial Performance

Internal Operations

Reduce Cost



Capital Efficiency



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Customer Engagement

Earning Growth

Better Revenue Management

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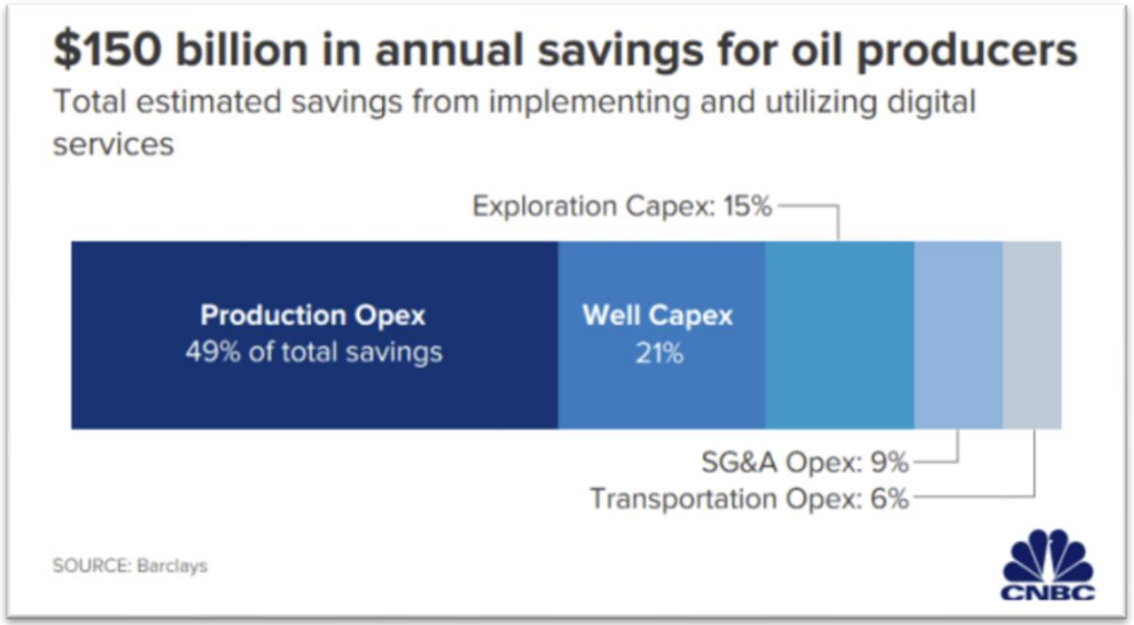
Sources: AMPE Consulting Group, March 2020 Report

Enhanced Digital reporting tools- Kaizen costing



- IOT and Robotization: Advanced ***predictive maintenance analytics*** can reduce 70% of Pipeline leaks
- IIOT: reduce ***unplanned downtime*** and excessive maintenance cost

- Revamp the financial reporting tool for ***dynamic analysis***
- ***Embrace waste costing management*** through Kaizen costing

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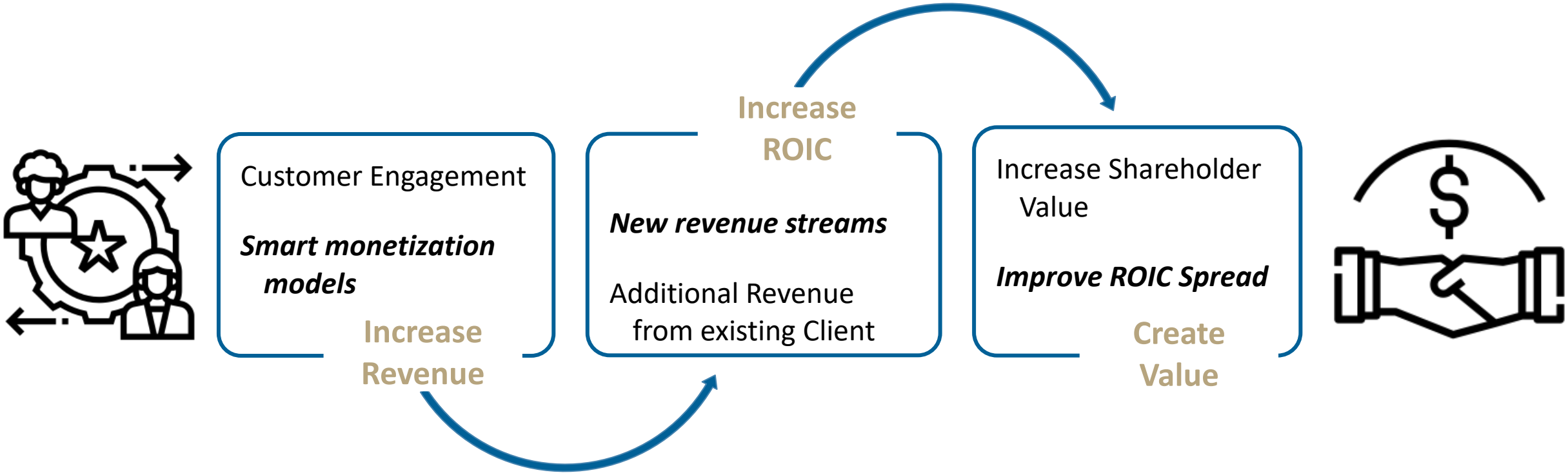
Sources: CNBC, AMPE Consulting Group, March 2020 Report

Digital Capabilities drive up to ***9%*** of Additional Revenue



Digirati deploy smart asset tools to enable instant collaboration between the Finance and Marketing

Embrace | Revamp | Deploy | Lead

Sources: Professor Rockney Walters, Marketing department, Kelley School of Business , AMPE Consulting Group, March 2020 Report

People

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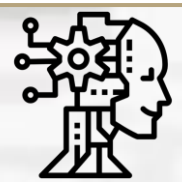

Customer

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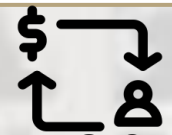
Performance



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Embrace, Revamp, Deploy: The Next Five Years

Short-Term Wins

Technology Tools

- Soft launch IoT upstream
- AI/ML pilot program expanded midstream
- First candidates from hiring revamp begin work

People & Culture

- Launch new CIO role
- Revamp Application Process for Fall
- Initiate shift to cloud
- AI/ML pilot program deployed upstream

Long-Term Success

Linking Internal & External Digitization

- Implement large scale rotational programming opportunities
- Expand customer engagement

New Capabilities

- Supply chain wide AI/ML and IoT roll out
- Mobile hardware investment and virtualization expansion

Metrics & Measurements

- Fully integrated process to evaluate firm performance and readjust

2020 2021 2022 2023 2024

Embrace → Revamp → Deploy → Lead

Sources: AMPE Consulting Group, March 2020 Report

Embrace, Revamp, Deploy: The Final Verdict

People

O&G Toolkit

Customer

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CIO and TMT

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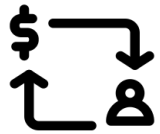
Performance



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Innovating Energy for an Inclusive Future

Embrace | Revamp | Deploy | Lead

Sources: AMPE Consulting Group, March 2020 Report

Welcome to your inclusive future

Appendix

- What is the current situation in oil and Gas?
- What opportunities exist in the Oil and Gas Supply Chain?
- What are the details of the Human Capital Plan?
- What is the tech toolkit deployment timeline?
- How can Data Analytics be expanded?
- What are the benefits of Industrial IoT in the industry?
- What is Artificial Intelligence at a high level?
- How is Virtualization used?
- What role does automation play?
- How to deploy Mobile Devices
- Why is Cloud Technology Important?
- What is the Embrace, Revamp, Deploy Framework?
- What are the expectations of Digirati Profitability?
- What are the SOGC Cost Savings Estimates?
- What are the Crude oil Production levels?
- How can we prioritize AI?
- How Tech and Energy are teaming up?
- How AI can help the oil industry?
- What is the Marketing Power of the industry?
- What Change Management Frameworks are most applicable?
- What are the transformation risks and mitigation tools?
- What is the SOGC SWOT Analysis?
- What is the Shared Vision of the CIO and TMT?

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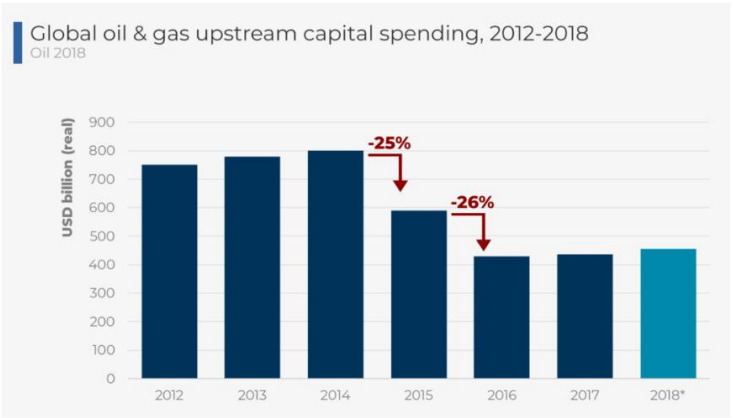
Oil & Gas Current Situation

- March 6th: Oil Prices plunge to lowest in 5 years due to supply shock from Saudi Arabia and Russia: https://www.cnbc.com/2020/03/06/oil-sinks-5percent-to-multi-year-low-on-uncertain-opec-deal.html
- March 9th: Oil prices plunged further in sharpest single day decline since the Gulf War of 1991: https://www.businessinsider.com/oil-price-crash-market-drop-global-price-war-futures-coronavirus-2020-3
- March 30th: Oil prices plunged to lowest level in 18 years: https://www.bbc.com/news/business-52089127
- April 9th: It appears that a deal between Saudi Arabia and Russia is likely: https://www.wsj.com/articles/russia-and-saudis-have-agreed-in-principle-to-cut-output-11586445159

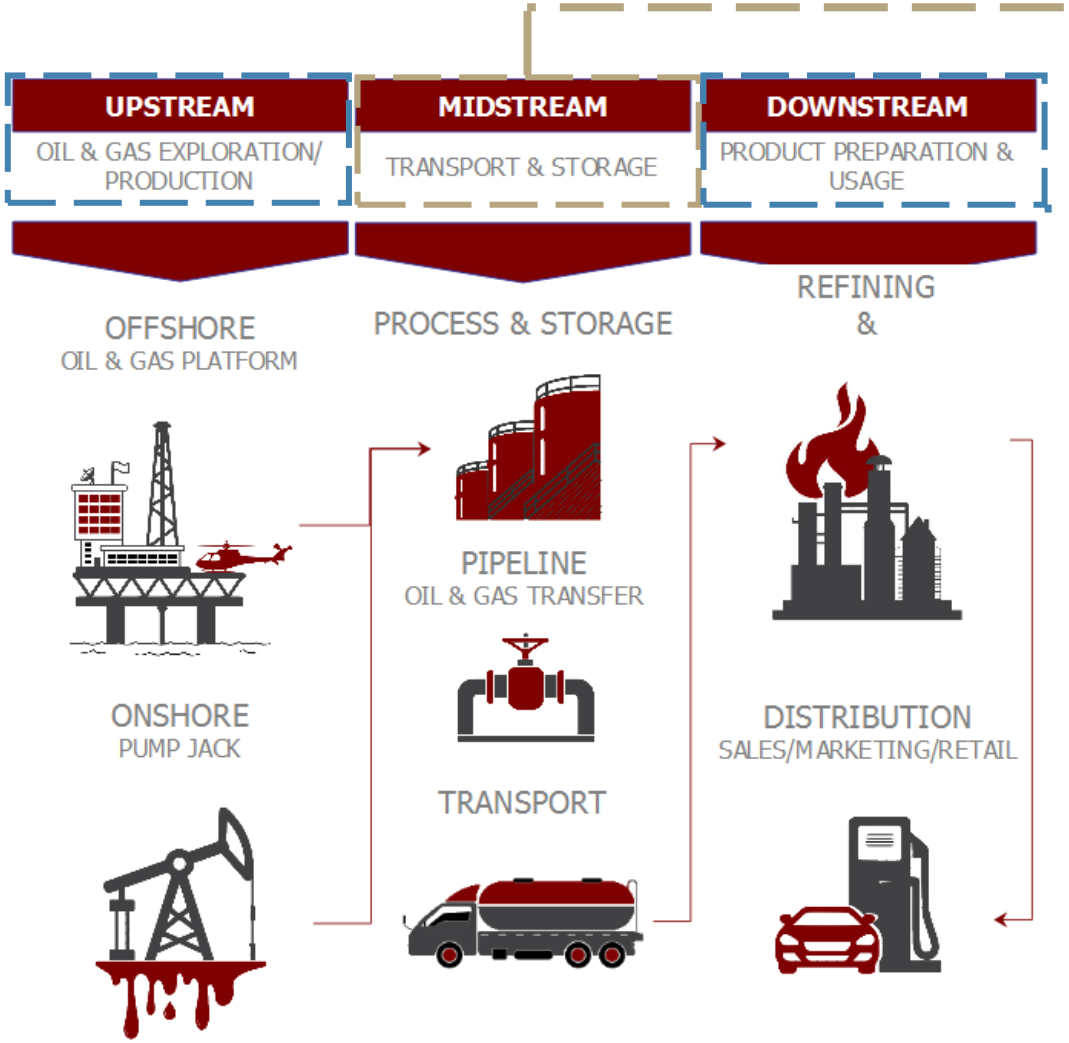
Appendix

Background: Current Process & Opportunity



Upstream

- Large Scale Infrastructure Optimization
- Decrease Annual CapEx Spend



Midstream

- Resource Transfer
- Remote Monitor Oil Levels

Downstream

- Enhanced Consumer Experience
- Improved Brand Familiarity

Appendix

Sources: Schedule Reader, Oil and Gas Industry Overview

Human Capital

Appendix

Human Capital: Demographics gaps

- Hispanics and African Americans Under Index within the Oil and Gas industry compared to the National Average
- White Males Over Index within the Oil and Gas industry compared to the National Average

Petroleum Fuels – Demographics, Q4 2018

	Oil		National Workforce Averages
Male	464,164	77%	53%
Female	138,646	23%	47%
Hispanic or Latino	78,100	13%	17%
Not Hispanic or Latino	524,711	87%	83%
American Indian or Alaska Native	12,062	2%	1%
Asian	37,702	6%	6%
Black or African American	35,406	6%	12%
Native Hawaiian or other Pacific Islander	5,256	1%	>1%
White	461,721	77%	78%
Two or more races	50,663	8%	2%
Veterans	60,883	10%	6%
55 and over	134,851	22%	23%
Union	12,373	2%	11%

Appendix

Source: 2019 U.S. Energy and Employment Report

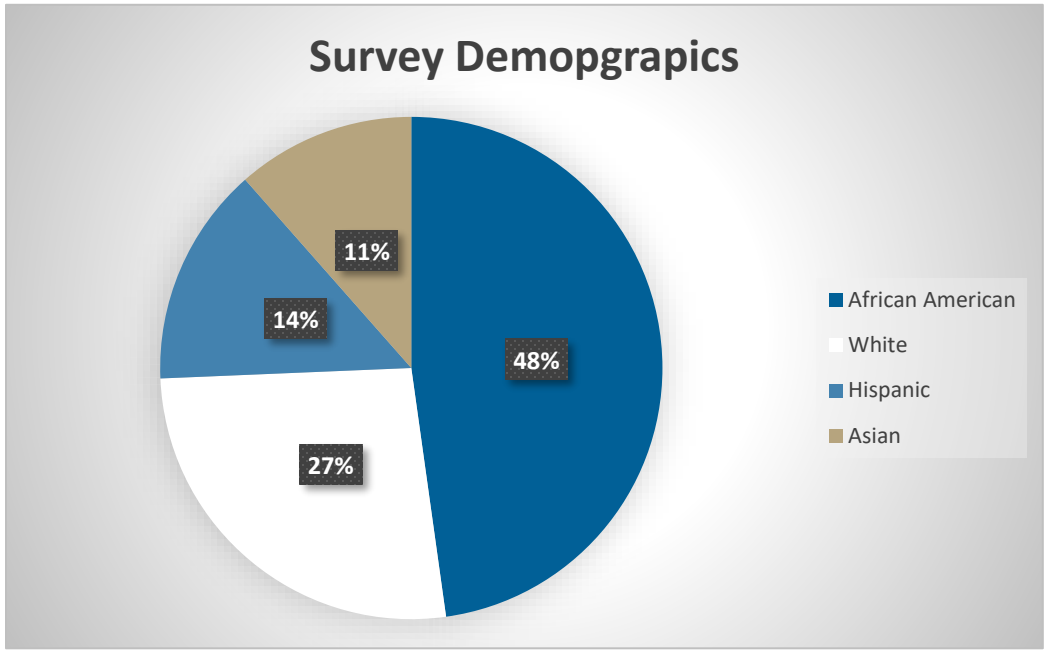
Human Capital: Over a 100 survey responses

Negative Perceptions of Energy Sector

- Lacking innovation
- Destroying communities taking land for profit
- Resistant to change
- Close-nit homogenous community (i.e. the 'good ole boys' club)

What do Diverse Millennials/GenZ care about?

- Interest in technical roles
- Obtaining a role with a high starting salary
- Job security
- Create a sustainable energy sector



Appendix

Source: AMPE Consulting Group

Human Capital: Application and Interview Revamp

- Reduce the application to include resume and 250 exert on the need for digital transformation in the Oil & Gas Space
- Give the Candidates a chance to share their experience relates to company values (reinforce the culture re-building)
- Presentation based interview allowing candidates the opportunity to display their technical background

Appendix

Source: AMPE Consulting Group

Human Capital: Diversity Consortium

- Who: Diversity Consortium
- What: 200 selected MBA & Mid career Technology focused Minorities
- Where: Houston, Texas
- When: Annually in July
- Why: Debunk Oil & Gas Perception, design thinking sessions on bringing innovation into the Oil and Gas Sector, Recruiting, and Brand Building

Appendix

Source: AMPE Consulting Group

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Human Capital

THE EXECUTIVE LEADERSHIP COUNCIL
The Power of Inclusive Leadership

Retention

Objective: Increase and ***embrace*** representation of Millennial, Generation Z and diverse talent in SOGC's 27k employee base.

Key Activities: **Diversity Leadership Rotational Pipeline** Building an Inclusive Culture, Recognition Awards, Transparency in Pay

Employee Resource Planning

Objective: Create a committee that is diverse and representative of unique talent which will support digital transformation initiatives

Key Activities: **Improve internal structure to source talent** ,establish Target demographic for SOGC, identify priorities, assess Internal capabilities

Appendix

Sources: Oakstone, LA times, Payscale, Intel, U.S. Census Bureau, Square Space, Oil & Gas Consumer Insights 2020 Survey

Human Capital

Metrics to track

Objective: To reduce hiring timelines and maintain the quality of diverse candidates within SOGC

Key Activities: **Average cycle time to hire**, Internal and External research

Outreach & Awareness

Objective: Raise awareness of technology transformation taking place within SOGC and how these internal developments will attract top diverse talent

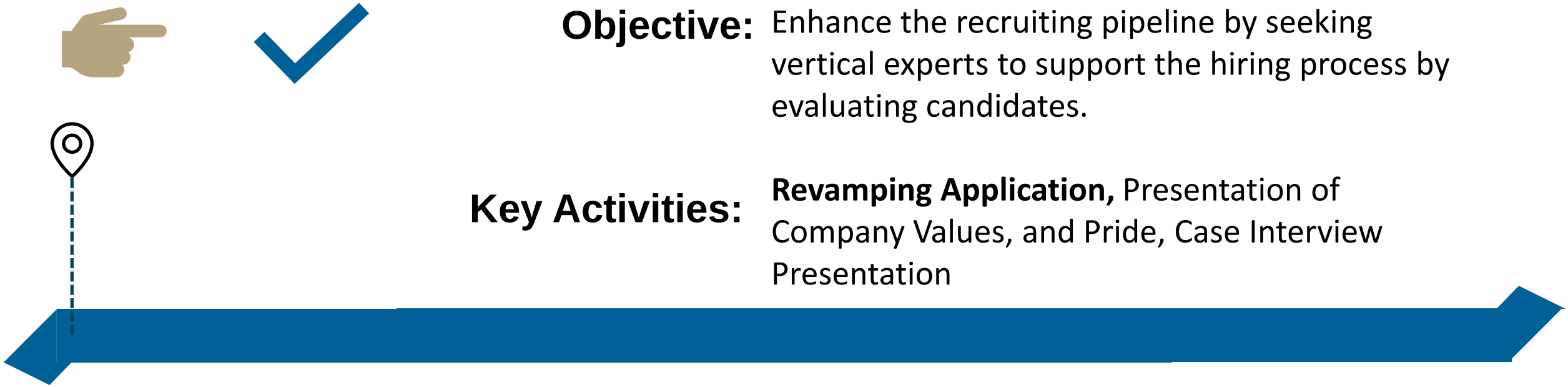
Key Activities: **Diversity Consortium**, Organize Annual technology focused service projects with HBCU's, Oil and Gas sponsored, Social Media Content Creation

Appendix

Sources: American Corbanone, Society of Human Resource Management

Human Capital

Conversion & Employee Selection



Objective: Enhance the recruiting pipeline by seeking vertical experts to support the hiring process by evaluating candidates.

Key Activities: **Revamping Application,** Presentation of Company Values, and Pride, Case Interview Presentation

Appendix

Source: Society of Human Resource Management

Human Capital: Key Activities

Transparency in Pay
- Access to a breakdown of functional roles pay
- Access to Demographic based pay

Recognition Awards
- Provide an opportunity quarterly for employees to submit a write up up on a project they believe they have went above and beyond for within the organization.

Diversity Rotational Program
- Pipeline to develop diverse talent
- Recruit from STEM certified programs that integrate technology into their learning
- Leadership opportunity working in multiple verticals

Assessing Internal Capabilities
- Identifying Internally where the gaps in performance and leadership are, and identify the talent and resource to revamp the department

Average Cycle time to hire
- Energy sector takes 28.8 days (2nd to last)
- Capturing top talent before they are poached
- Shortening the application will allow us to narrow focus

Internal & External Insights
- Continuing to evaluate the brand perceptions internally & externally of how Millennials & Gen Z perceive the Oil & Gas energy and track the evolution of the perception due to Diversity initiatives and digital transformation growth.

Appendix

Source: Oakstone: Top 8 reasons to stay with a company , Glassdoor Survey

Human Capital: Key Activities

Social Media Content

- Select a diverse set of employees
- Share their experiences in the digital transformation space
- Deploy the content on social media platforms to raise awareness around clean energy initiatives

HBUCU Annual Technology Focused Service Project

- Provide mentorship to minorities
- Close the cultural gap
- Discuss technology innovation within the Oil and Gas space

Appendix

Source: AMPE Consulting Group

Tech Deployment Timeline

Q3 2020
- Select cloud provider and begin cloud migration (expected to be completed by Q4 2021)
- Identify AI/ML out of the box solutions for upstream technology

2021
- Expand AI/ML pilot to midstream
- Soft launch of IIoT with sensors applied to upstream assets
- Retirement of on-site servers

2022
- Full roll out of AI/ML and IOT
- Mobile hardware deployment and virtualization roll out
- Expect to achieve cloud cost savings

2023
- Ongoing tech deployment
- Expect to begin realizing AI/ML cost savings
- Additional data analysis tools and training opportunities for staff

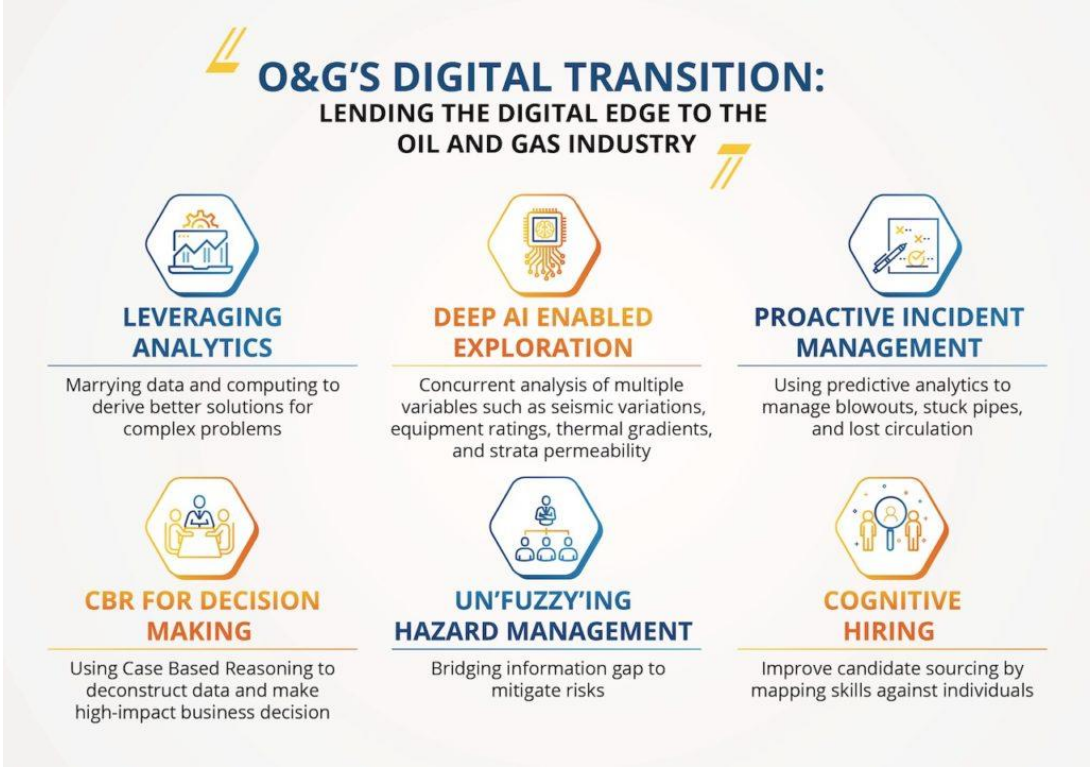
2024
- Anticipated to begin reaping the benefits of IoT and virtualization through increased processing

Appendix

Source: AMPE Consulting Group

Data Analytics

- **<u>Data is like crude. It's valuable, but if unrefined, it cannot really be used.</u>**
- Focus of new analytics and big data is on data not being captures such as fleet management, acquisition and divestment data sets, leasing and well data.
- Data analytics can improve production by 6-8%
- Data is important because:
  - In real-time it is highly cost effective especially with visualization
  - Risk reduction and improved decision making
  - Improves accuracy in drilling methods and oil exploration
  - Ensures efficient performance of machines
- Some companies have 100+ employees working in data analytics
- Investment in big data is expected to increase from 56=61%
- The oil and gas industry produces terabytes of data every day 40, and **the overarching challenge is less about how to gather more data, but rather how to maximize the efficiency of the data already collected as less than 1% of the data is ever analyzed.** There has been a movement towards translating the huge volumes of data into 'meaningful, intelligent information that can be leveraged to make important business decisions.



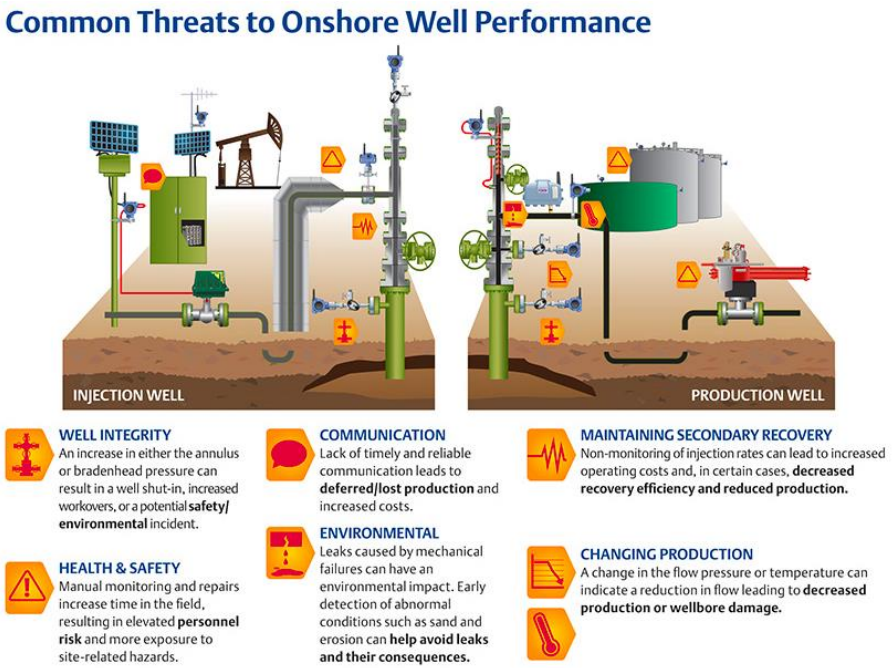
Appendix

https://www.oilandgaseng.com/articles/the-digital-fuels-the-oil-gas-industry-toward-profitable-transformation/

https://towardsdatascience.com/here-is-how-big-data-is-changing-the-oil-industry-13c752e58a5a

Industrial IoT (IIoT)

- Important for:
  - Optimizing efficient pumping activities
  - Maintaining the pipes and wells
  - Monitoring equipment failures and gas leaks
  - Monitoring pipe thickness, temperatures and erosion in a refinery
- Has been used in:
  - Offshore oil and gas rig monitoring
  - Refinery monitoring
  - Pipeline monitoring
  - Wellhead monitoring
  - Oil and gas shipping
  - Supply chain management
- IoT in oil and gas allows for swift automation and deployment of concurrent tools such as sensors which will trigger a maintenance truck. The peak of the s curve in IoT is asset optimization
- Currently, the energy industry ranks third in Industrial IoT leadership behind peers in the transport and maritime industries, implying there is an opportunity to leverage tools and techniques from other sectors to improve positioning. The oil and gas industrywide adoption rate is expected to increase the global GDP by as much as $816B over the next decade.
- Industrial IoT requires thousands of endpoints to be connected to a system. Once connected, companies can track and analyze processes on a granular level which can allow a company to make strides in predictive maintenance resulting in significant cost savings.



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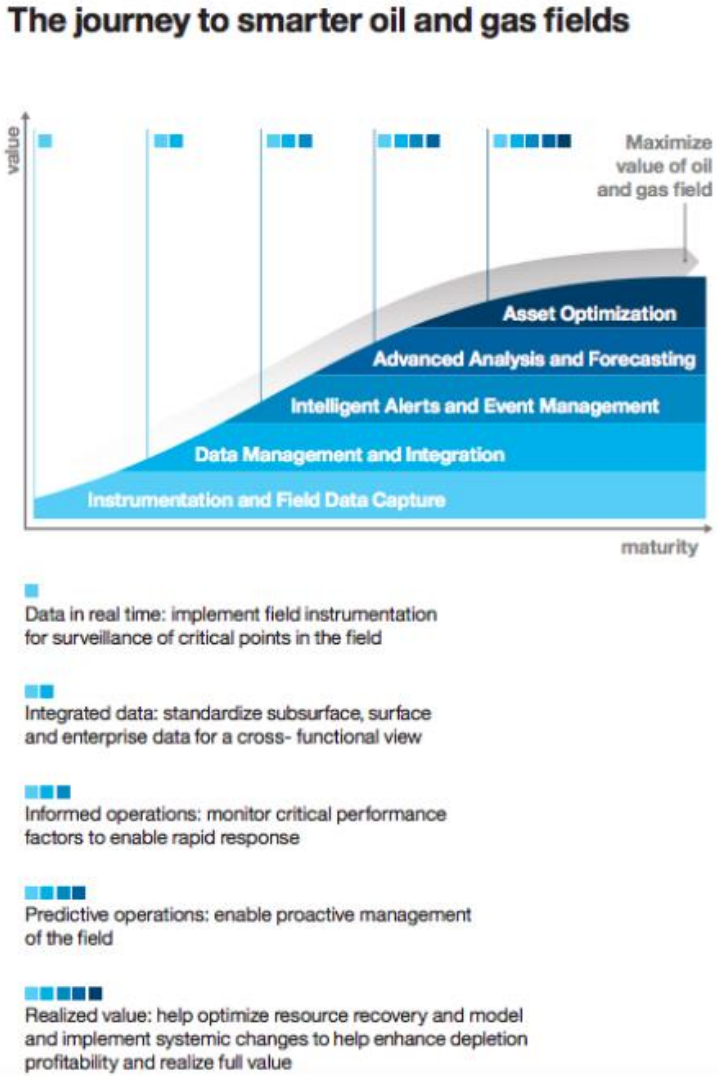


https://www2.deloitte.com/us/en/pages/consulting/articles/iot-digital-oil-and-gas.html

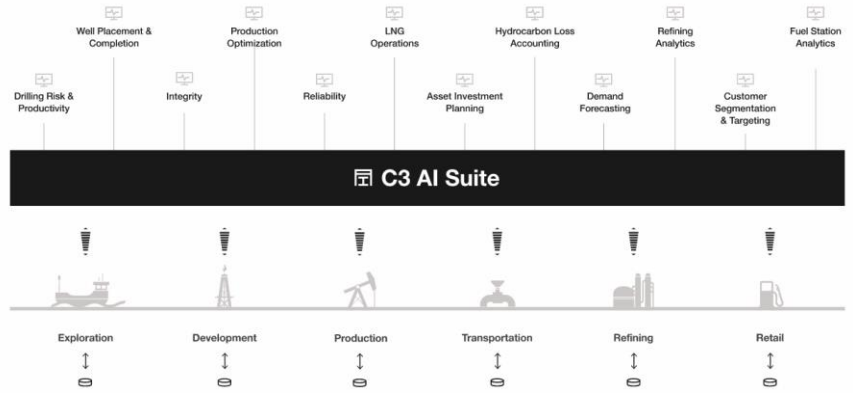
https://www.link-labs.com/blog/iot-oil-gas-use-cases

KELLEY
SCHOOL OF BUSINESS
MBA Program

THE EXECUTIVE LEADERSHIP COUNCIL
The Power of Inclusive Leadership

Artificial Intelligence/Machine Learning

- The mismatch between the number of AI projects and the number of data scientists led to a huge reskilling opportunity. Royal Dutch Shell has been training employees in other divisions in artificial intelligence through Udacity online courses which are even more practical during the Covid-19 time. Even with cuts to the company's operating budget, the company plans to ensure the courses are available to all US employees. The programs range from Python to neural networks over the course of 4-6 months (10-15 hours per week). Key is to leverage the workers you already have rather than firing workers and hiring new ones- which is expensive, also increases employee satisfaction
- Allows employees to spot maintenance needs in equipment before they break down, identify areas to reduce carbon emissions and quickly process seismic data
- Lures in younger employees by highlighting the tech aspect of the industry, there is an expectation of constant reskilling.
- Oil & Gas AI/ML investment anticipated to reach $3B by 2022
- Some companies such as Exxon already have AI/ML as a significant portion of their R&D spend ($1B total annual R&D spend for Exxon) for things such as Deepwater oil detection, robotics, precision drilling, predictive maintenance,
- Uses are currently primarily in trading and FP&A functions, but has immense potential to dig through the data on valve positions, pump speed, pressure, temperature, etc.
- By using computer systems to perform tasks humans would normally perform, Artificial Intelligence is being used to reduce the likelihood of equipment failure, manage employees and increase overall oil outputs. Since the mass shift to convert data collected from the supply chain to digital platforms, there has been an immense opportunity to identify patterns and trends which can guide spending and operations.
- ***Exxon Mobil*** notes their database contains approximately 5 trillion data points collected from their 42 global refineries and chemical processing plants. Having a massive database makes it essential to leverage technological advances like AI to optimize working processes as it is impossible to rely on data analysts to weed through the data with traditional computer equipment. Artificial intelligence often goes hand in hand with machine learning (ML) tools such as algorithms, which help provide data scientists with insights and solutions such as ways to reduce emissions.
- BP Shell product "Hands" in which experts train algorithms to ensure capturing the expertise of retiring employees
- Long term estimates of AI/ML in oil and gas suggest upwards of $1T in savings according to PWC
- 40% of respondents to an October 2019 survey said AI/ML deployment took more than 30 days to deploy vs. 28% where it was accomplished in 8-30 days and 14% in 7 days or less
- A recent Accenture study suggest AI/ML investments lead to 30% increases in revenue within 4 years

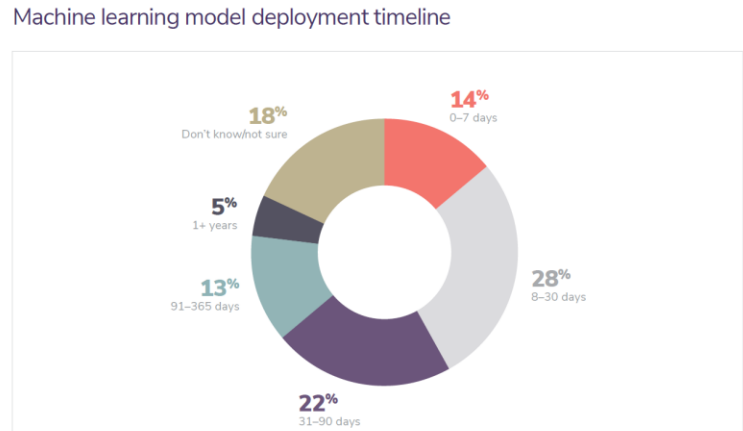


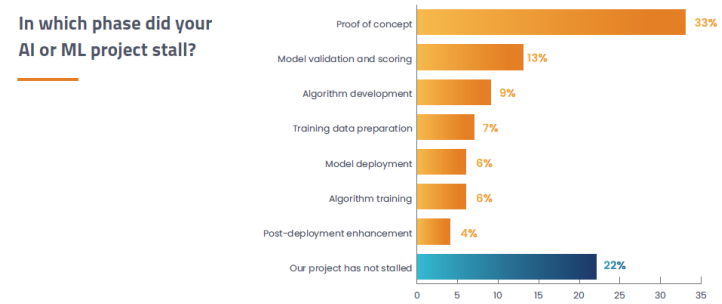
Seeq
ARUNDO
SOTA OG
WELLAWARE
Ambyint

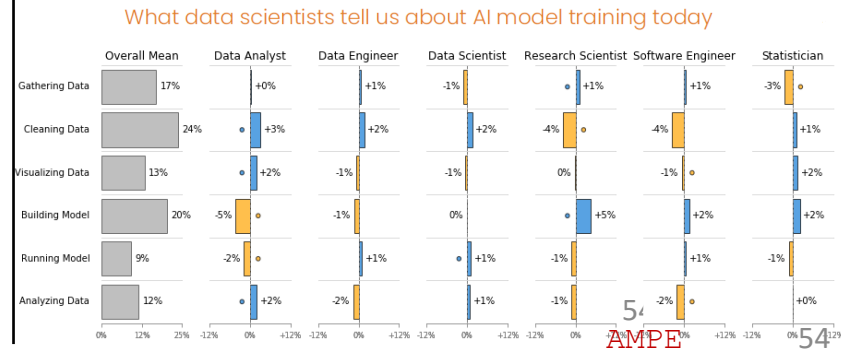
New oil and gas tech startups offer out of the box AI/ML solutions which can be scaled easily and averages around $1K/user/year, estimated to cost $15M+ annually when 55% of staff have access

SIEMENS
ICONICS
ABB
YOKOGAWA
EMERSON
Schneider Electric
Rockwell Automation
Honeywell

Legacy resource providers offer enterprise (custom) AI/ML solutions which can be customized and are estimated to cost $7K/user/year, estimated to cost $100M+ annually when 55% of staff have access







[Appendix](#)

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https://www.cnbc.com/2020/04/03/royal-dutch-shell-reskills-workers-in-ai-part-of-energy-transition.html
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https://www.wsj.com/articles/oil-and-gas-companies-turn-to-ai-to-cut-costs-11571018460
https://opportune.com/Energy-Sector-Insights-Events/Insights/AI-Machine-Learning-The-Next-Transformation-for-Oil-Gas/

Virtualization

- Virtualization turns a traditionally hardware bound process or instance which usually involves complex processes and large-scale infrastructure, into a virtual instance which can be observed and monitored on a simple platform such as a laptop or tablet. It is desktop emulation.
- Virtualization reduces data loss and theft and enable database continuity. Easily access tons of data which would be difficult to download. Challenges of maintaining hardware off-shore and in other precarious places can be mitigated and virtualization ensures everyone has access to the right data at the right time
- Being mindful of the need to safeguard intellectual property, hosting apps and workstations via virtualization security protocols can preserve endpoint security
- Estimated costs are $15K per server and each server can accommodate upwards of 80 virtual machines
- Cost savings are achieved by reducing the amount of hardware which needs to be purchased and maintained, with estimates of annual savings

Appendix

https://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/ucs-b200-m4-blade-server/cegal-voc-case-study.pdf
https://www.controleng.com/articles/virtualization-technologies-reduce-risk-downtime/
https://electricenergyonline.com/energy/magazine/802/article/Managing-a-Mobile-Workforce-with-Virtualization.htm

Automation

- Investment in automation is expected to increase from 53% to 65%
- Automation can help oil and gas in:
  - Daily drilling operations
  - Diagnostics and inspections
  - Weather monitoring
  - Pressure and flow
- The pattern recognition from the large amounts of data collected by the industry drives automation. In the upstream process, ensuring precision through the use of large datasets to pinpoint exact locations for drilling and methods of extraction can result in large savings. Additionally, automation allows for the opportunity to preserve and manage assets by reducing or optimizing downtime of rigs and other pieces of complex and expensive equipment.

Appendix

https://www.rigzone.com/news/oil_gas/a/151411/automation_is_the_key_to_the_future_of_oil_and_gas/

https://towardsdatascience.com/here-is-how-big-data-is-changing-the-oil-industry-13c752e58a5a

Mobile Devices

- Mobile devices can be used for inspections, compliance, maintenance and asset tracking. Can achieve savings of $5B annually if deployed correctly.
- Rugged and explosion proof laptops, tablets and mobile devices range from $300 - $3000 each
- Wearables range from a few hundred to $1K and reduce the burden of radio staff who can monitor health vitals remotely including gaining a better understanding of the impact of conditions on the body. This eliminates the need to spend $1K-$5K on radios
- As cellular technologies in the oil and gas industry have advanced aggressively to the point many companies own, provide, and manage cellular connectivity in the field (such as Houston based Infrastructure Networks), staying connected is no longer an issue, rather the main focus is the ability for companies to utilize the most optimal hardware for data collection and management.

[Appendix]

https://www.i-cio.com/strategy/digitalization/item/the-role-of-wearable-tech-in-the-oil-and-gas-industry
https://www.ruggedmobilityforbusiness.com/2019/05/using-rugged-tablets-safely-in-energy-oil-and-gas/
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Cloud Technology

- Cloud technology is the building block of digital transformation as it allows seamless storage, easy access to the right parties and ongoing coordination across users and technology (AI/ML, IIoT, Mobile devices) which all log into the cloud
- The Hess Corporation expects to optimize costs by roughly 40% by shifting to cloud services with anticipated labor savings of 10-20% through cloud management automation
  - Cost optimization mans shifting expenses to other critical places such as shifting money which would be spent on on-site servers towards drilling equipment, talent recruitment, etc. This allows for more computing power, and faster ap
- General speaking the primary cloud providers are Amazon Web Services and Microsoft Azure, but there are opportunities to leverage the Google Cloud, IBM, and other less popular platforms for discounts.
- Migration timeline takes on average 2-12 months and depending on the server costs $5K-$15K per server

Appendix

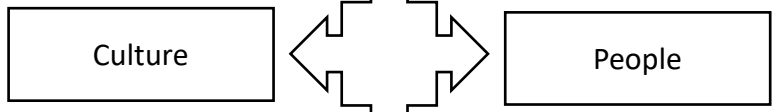
https://www.accenture.com/_acnmedia/pdf-69/accenture-cloud-vision-pov-oilgas-112117final.pdf

Embrace, Revamp, Deploy Framework

Embrace

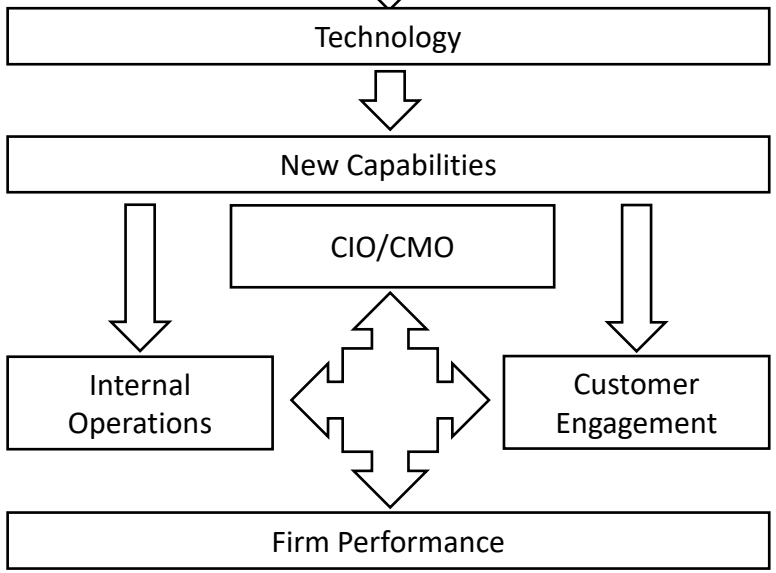
- **The Chief Information Officer (CIO) in the Top Management Team (TMT) to best achieve Informational System (IS) strategic alignment**

Revamp



- **Culture and People through Diversity and Inclusion initiatives**

Deploy



- **Create an Oil and Gas toolkit**
- **Reframe technology around new capabilities**
- **Ensure a Market Orientation through the CMO**
- **Quantify and communicate financial performance with key metrics**

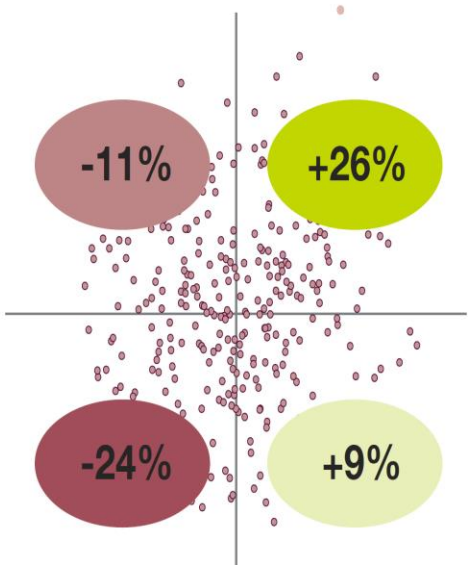
Appendix

Digirati Profitability and Market valuation

PROFITABILITY

Companies with stronger transformation management intensity are more profitable

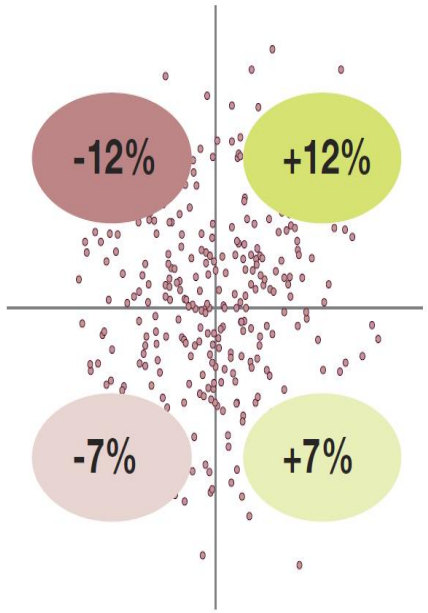
Basket of indicators:
- EBIT Margin
- Net Profit Margin



MARKET VALUATION

Companies with stronger transformation management intensity achieve higher market valuations

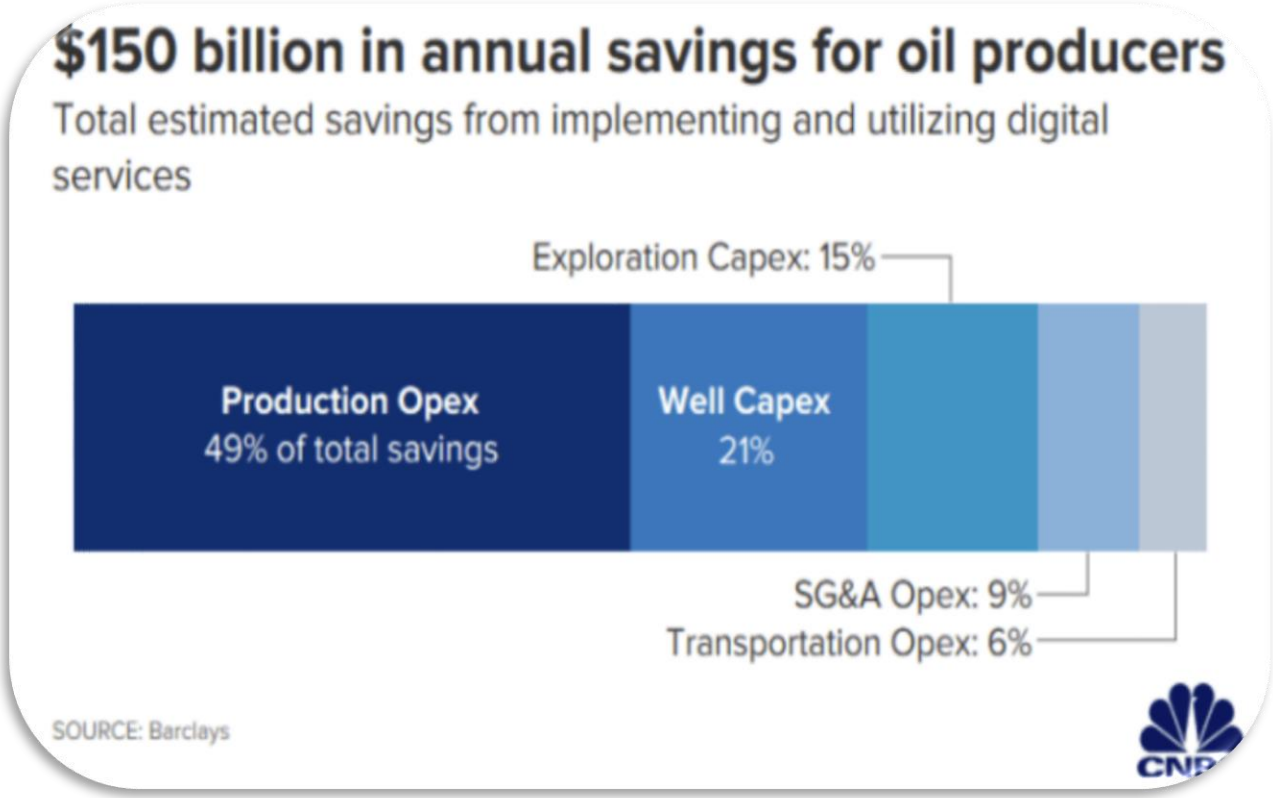
Basket of indicators:
- Tobin's Q Ratio
- Price / Book Ratio



[Appendix]

Sources: MIT Center for Digital Business,

SOGC's Digital transformation cost savings estimate



"Barclays estimates that greater efficiencies will save producers roughly $150 billion annually, which translates to shaving $3 per barrel from the production price of oil."

Annual oil production 100.8Bbrls * $3*50%
~ = ***$150 B savings***

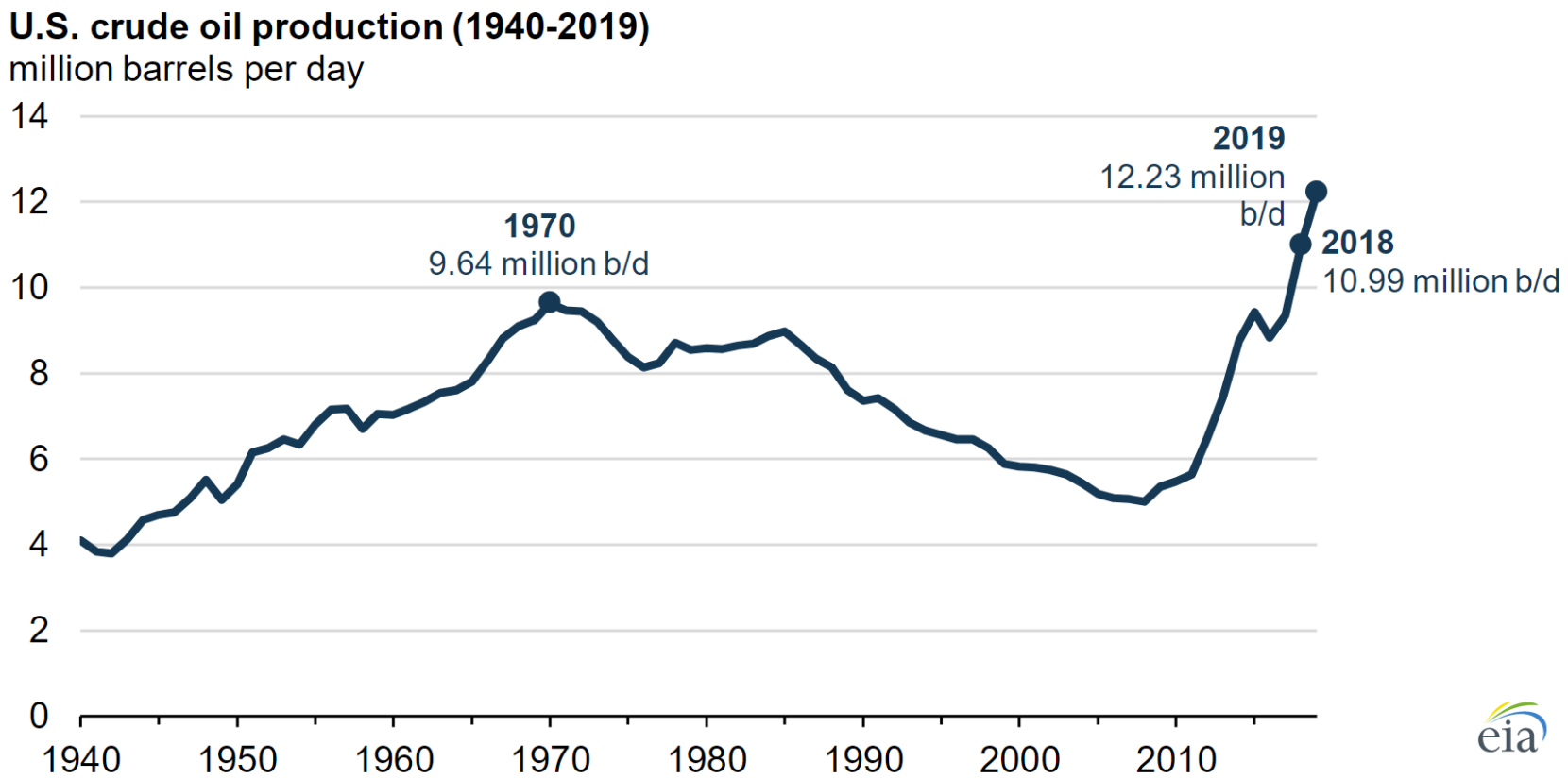
Potential SOGC Savings :
$3/ barrel * 2.5 M Avg Daily oil production * 365 D= ***$2.7B***

Appendix

Source: CNBC, Facset

MARCH 2, 2020

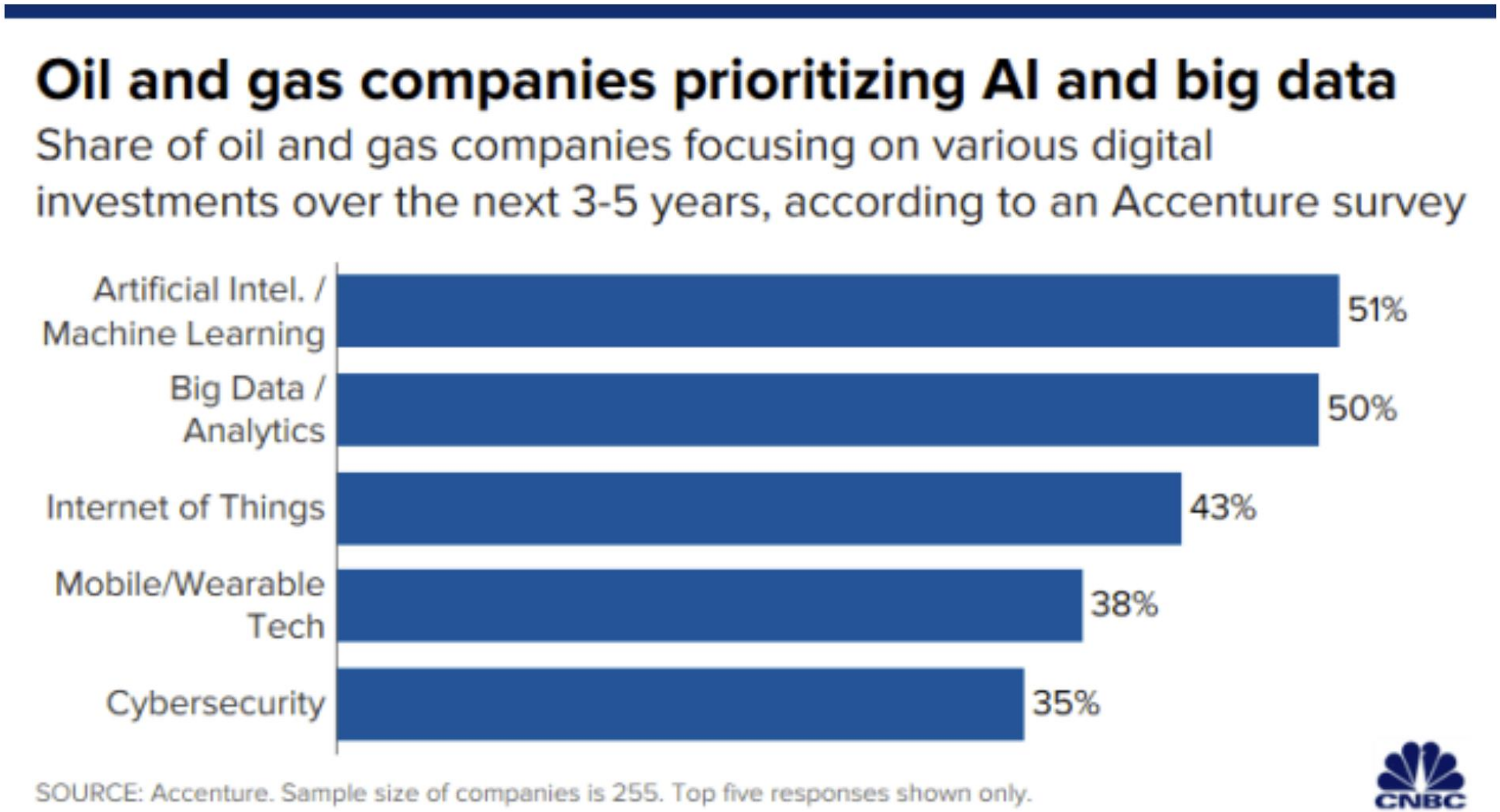
U.S. crude oil production grew 11% in 2019, surpassing 12 million barrels per day



Source: U.S. Energy Information Administration, *Petroleum Supply Monthly*

Appendix

Source: US Energy Information Administration



Appendix

Source: CNBC

How Tech and energy are teaming up?

"They [energy companies] are realizing that they're not IT companies. They're not software developers, but they are users of it," IHS Markit director Carolyn Seto said to CNBC. "They are partnering with these [tech] companies to be able to gain access to these new technologies, as opposed to taking the development costs themselves of building out capabilities within their organization."

"Tech companies can harness insights from applications refined and tested across sectors. It's difficult — if not impossible — for individual companies to fully replicate what they offer. In other words, partnerships where applications and technologies are co-developed can be the only choice."

Appendix

Source: CNBC

How AI Can Help The Oil industry?

UPSTREAM

- Calgary-based Ambyint has developed intelligent High-Resolution Adaptive Controllers (HRACs) which integrate with the hardware and instrumentation, such as the motor, controller, variable frequency drive, and other moving parts of lift systems
- MinePortal, developed by Seattle-based DataCloud, is a cloud-based platform for real-time management and analyzing of the geosciences data. The service integrates exploration drill data, block models, and control measures into a single platform, which can help make better faster drilling and blasting decisions to improve productivity.
- Silicon Valley data supplier Tachyus developed a platform that collects data from sensors and integrates it with data from seismic activity, drilling logs, cores, completion designs, production

Midstream

- AKW Analytics uses machine learning and patent-pending technologies in its PALM (Petroleum Analytics Learning Machine) software product suite, which provides big data analytics for E&P and midstream pipeline gathering operations.
  AKW company has built a real-time intelligent system with forecasting and optimization capabilities for better decisions and operating performance.

Downstream

- Digital H2O is an American digital oilfield solutions company that uses a proprietary data model and predictive algorithms to develop software-based insights and solutions for the end-to-end management of water in oil and gas production. This is important, as oil refineries use a huge volume of water. Digital H2O's service can manage water use more efficiently to reduce costs.
- Downstream refiners need to streamline their refinery and petroleum delivery operations to accelerate revenue growth. California-based Oracle Cloud helps downstream companies with its Oracle EPM Cloud, which can increase modeling speed and forecast financials through scenario analysis, lowering operation costs.

Appendix

Source: https://medium.com/syncedreview/how-ai-can-help-the-oil-industry-b853dda86be6

Change Management Frameworks

Workstream/ Phase	Assessment/Planning	Design/ Implementation	Measure/ Sustain
Change Management	• Analyze stakeholders; ensure C-suite buy-in • Create dashboard to calculate ROI • Assess target readiness	• Engage early adopters with rewards and recognition • Celebrate small wins; showcase success stories • Design performance measures and rewards strategy to hold branch managers accountable for successful implementation	• Measure outcomes against dashboard • Reinforce desired behaviors with rewards and senior leadership support
Communications	• Clarify business case for change • Inventory and plan to leverage current communication practices, channels • Identify strategies to accompany change phases of denial, resistance, exploration, commitment (create attention, interest, desire, action)	• Create multiple channels for communicating status AND soliciting feedback for ALL organizational levels (mid-management, floor-level employees, etc.) and ALL stakeholders (including suppliers and customers) • Establish knowledge center featuring two-way communications • Create regular pulse checks and other ways to solicit satisfaction levels/ feedback • Engage and empower leadership to communicate effectively	•
Training	• Inventory offerings and current delivery methods—assess gaps • Assess skills and knowledge gaps for users	• Design training for new system; deploy train-the-trainer program to build awareness and gather intel • Create multiple channels for delivering training content	• Create JIT training to support ongoing use and to onboard new employees

Appendix

Workstream/ Phase	Assess	Implement	Measure/ Sustain
People (Change, Communications, Training)	• Get clarity on new strategy from initiative owners (SWOT analysis) • Conduct stakeholder analysis (both C-suite for buy-in and to determine who is affected and to what degree) • Create multi-channel change strategy tailored to specific audiences (review organization's history with change) • Inventory current communications to determine what to leverage; create strategic plan with resource needs	• Change adoption (Kotter's 8-steps) • Communications: 1) phased over time to take users from awareness to acceptance, 2) create two-way mechanisms and respond to feedback, 3) keep leaders engaged, 4) take organization's pulse regularly	• Measure compliance • Reward and communicate small wins; reinforce behavior from senior leadership
Process	• Inventory current learning portfolio (types of training offered/ how delivered, e.g. classroom, e-Learning, other), compare with best practices and strategic vision to ID gap and visualize solution • Determine scope ("big bang" vs pilot/phased process), timeline, budget, resources; create project plan • Map out key business processes affected by new system, compare to best practices, and create new process flows (assess gap for training, communications) • Create dashboard for measuring success (decreased costs of delivery, improved productivity/ compliance) • Review ILPs and/or JDs to identify gaps between current state and KSAs needed to support future strategic direction	• Model new business processes and get feedback from users; iterate • Create marketing/ training on new processes for all user types (administrators, users), conduct train-the-trainer sessions; and rollout to organization • Update training portfolio to sunset outdated training (cost savings); revamp existing training (convert to new delivery methods); develop new training content as needed	• Create marketing materials • Populate LMS with updated portfolio; set enrollment targets; track and measure levels of improved performance
Technology	• Assess current HRIS system to determine whether/how to integrate • ID user requirements (e.g. self-service, regulatory compliance) • Select LMS system	• System config, integration, data migration, and interface development • Beta-test with power users (e.g. registration, back-office reporting)	• Integrate trouble-shooting with current IT services or establish new

Marketing Power: Creating New Digital Capabilities

CMO

Marketing Department Power

- positively associated with
  - short-term future profitability (ROA)
  - long-term future shareholder value (TSR)
- ability to build and maintain brand equity and customer relationships

Market Orientation

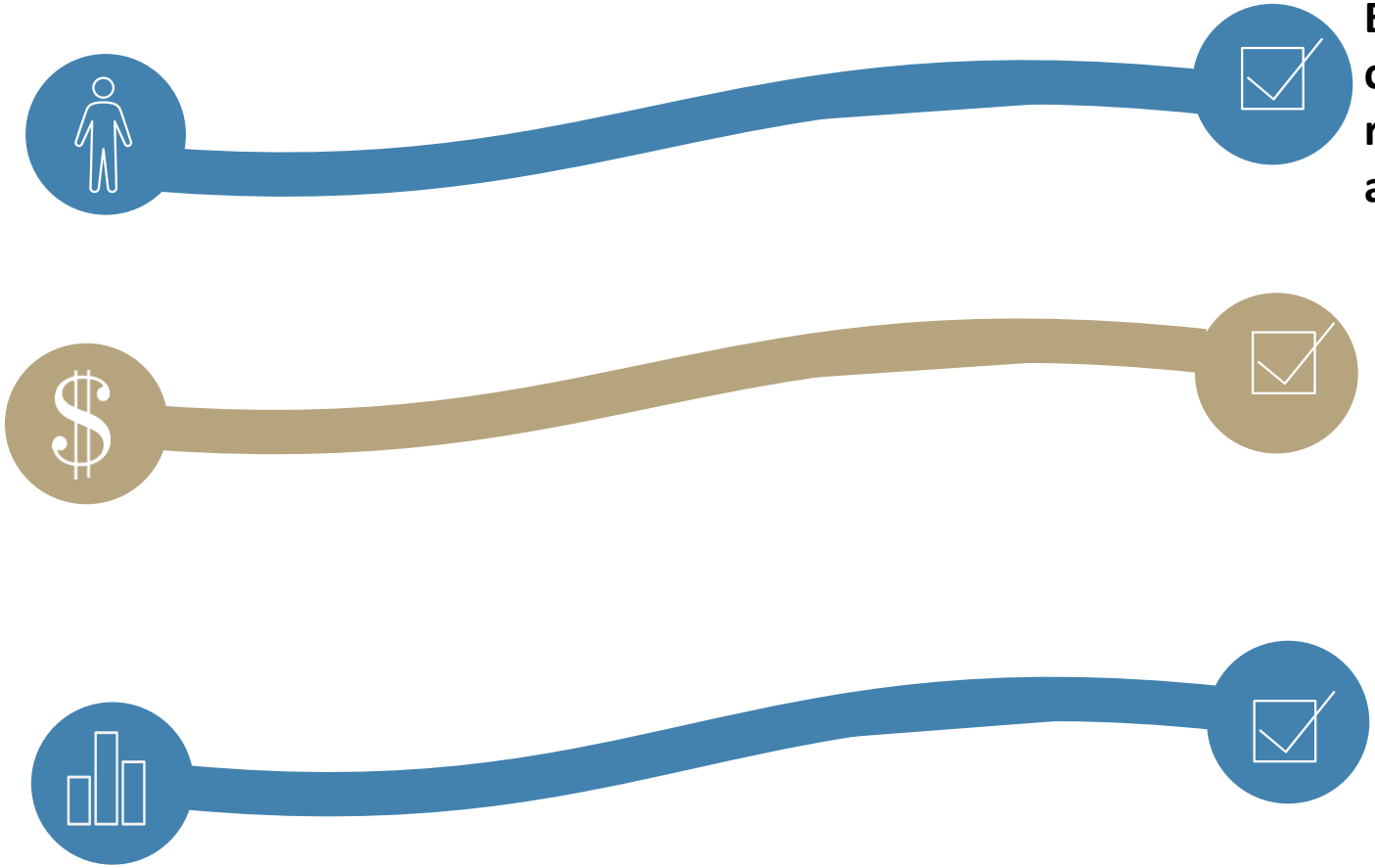
- superior perceived quality, customer loyalty, and customer satisfaction
- superior ability to “create and implement new ideas, products, and processes…”
- builds “sustainable customer relationships that span the trajectory of customers' needs..”

Enable internal operations and customer engagement to achieve the financial performance of a Digirati

Appendix

Source: AMPE Consulting Group

Risk	Mitigation
Fail to hire the right CIO & Lack of C- Suite buy in	**Evaluate CIO Candidate against cultural Change goals and reinforce C-Suite support against performance measures**
Lack of culture change adoption by mi-level manager and low level employee	**Empower Mid-level manager by Designing performance measures and rewards strategy for accountability**
Fail to achieve cost savings & generate revenue lift	**Invest in Smart Capital that increase Spread and Create long term value**



Appendix

Source: AMPE Consulting Group

SWOT Analysis

Strength: S

- **Strong Balance Sheet**
- Strong Market position in the industry
- Strong Brand

Weakness- W

- Lack of firm wide IT integration plan
- **Lack of C-suite engagement**
- **Risk averse culture**

Opportunities: O

- Cost savings $3 / Brl of oil produce
- **Build an Inclusive and Creative culture**
- **Embrace digirati to capture 9% lift**

SO- Strategies

"Deploy smart assets that increase firm value"

WO- Strategies

"Develop and firm wide innovative culture"

Threats: T

- Lack of Diversity
- Oil Supply and demand risk
- **Negative perception – "Hire to retire"**

ST- Strategies

" Partner with Technology company to build analytics to control oil production level and cost "

WT- Strategies

"Increase SOGC gender and ethnicity ratio to country index rate "

Appendix

Source: AMPE Consulting Group

Embrace a CIO to achieve strategic alignment around digital transformation

Shared Language of Business

Shared Common Interest

Visioning Network Hierarchy

CIO Strategic Knowledge

CIO Educational Leadership

CIO Relational Capital

[Appendix]

Sources: MIS Quarterly Executive