Digital Leadership Strategy for Super Oil and Gas Company (SOGC)

National Business Case Competition 2020 Executive Leadership Council

Prepared by AMPE Consulting Group



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Executive Summary

The rise of technology has been swift across all industries and <u>oil and gas companies have</u> <u>failed to capitalize on a \$150B opportunity</u>. In this struggle to stay technologically relevant, attract and retain talent, and maintain a financial edge, an increased focus on digital solutions has led to multi-billion-dollar savings and hastened the need for companies to evolve and innovate quickly.

In order to fully *embrace* the digital opportunities afoot, companies must ask themselves:

- 1. Where can we evolve quickly and efficiently for both long- and short-term gains?
- 2. Who will we attract and retain to lead in this new era of tech innovation?
- 3. What technological tools will we use?
- 4. How do we measure financial performance as it relates to digital investments?

Based on our analysis and review, Super Oil & Gas Company (SOGC) can catapult itself to new heights by implementing our three-pronged strategy: *Embrace*, *Revamp*, *Deploy*

- 1. Embrace inclusive and creative leadership
- 2. *Revamp* the recruiting and retention pipeline
- 3. Deploy smart capital into easy to use technologies

The Recommendation

In order to become a Digirati or digital leader, Super Oil and Gas Company must first, *embrace* inclusive and creative leadership. Our analysis advises elevating the Chief Information Officer (CIO) to a position of unique leadership and collaboration with the ability to set a clear vision and strategy with other company leaders. A significant component of this leadership is a simple and exciting mission or vision statement. We recommend: *Innovating Energy for an Inclusive Future.*

New leadership will result in unbridled cultural changes, creating the perfect opportunity to *revamp* the recruiting and retention pipeline. SOGC can successfully recruit diverse talent by shifting attention and focus to these new pipelines. We call attention to the demographic

underrepresentation which currently exists in the energy industry, where for example, African Americans who represent 14% of the national population only encompass 5% of industry talent. This push towards diversity and inclusion should aim to create a workforce whose demographics reflect the U.S. population. Additionally, the company can create new programming and training to elevate diverse and nontraditional talent to positions of leadership and creativity within the firm.

Finally, it is strongly suggested that the company *deploy* technological tools with a high return on investment. Our analysis suggests that an industry leader can achieve upwards of 9% more than its peers through digital transformation investments. This concept of 'smart capital' implies that the company is adhering to both the leadership vision and talent pipeline to build a future where employees have access to innovative technologies which convert the 99% of oil and gas data which currently sits unused into enhanced output, increased productivity and a stronger brand.

We are confident that "*Embrace*, *Revamp*, *Deploy*" will elevate the Super Oil and Gas Company brand and establish them as the digital leader in the oil and gas industry.

Background

Oil & Gas in 2020:

Although there is a generally favorable regulatory landscape here in the United States, due to the complex issues with consumer demand in light of the global COVID-19 outbreak and balancing supply changes in Russia and Saudi Arabia which have driven down the price of oil globally, the current climate in the oil and gas industry is one of uncertainty.

Despite these present challenges, AMPE believes that the oil and gas industry is primed for significant gains in digitization initiatives as the industry works to further technology investments and increase output and productivity with fewer people and capital resources. The opportunities present at this moment are sure to deliver significant returns for employees and shareholders and the two primary components are: digital transformation and human capital enhancements.

Current Oil & Gas Process:

It is important to briefly understand the process of oil and gas operations to understand the scope of possibilities for a digital transformation which can position SOGC as the industry leader.

• Upstream: oil production is the extraction of oil and gas from the earth. The large-scale infrastructure used to both explore and extract resources, such as rigs, are primed for technological optimization. The significant decrease in upstream capital spending suggests digitization is already afoot.

(Exhibit 1¹)



¹ Oil and Gas: Upstream, Midstream, Downstream Automation <u>https://clearsoftware.com/industry/oil-and-gas/</u>

- Midstream: oil production is the transportation and storage of the upstream output.
 There are opportunities to better optimize processes such as the resource transfer and remotely monitoring oil levels.
- **Downstream:** is the preparation and usage of oil and gas for consumption. We believe there are opportunities to enhance the consumer experience and brand familiarity through digital transformations.

(Exhibit 2²)



At each step along the way, there are numerous assets used for the execution of the process. <u>Super Oil and Gas Company has full ownership of assets within the supply chain creating</u> <u>numerous opportunities for deploying technology to better manage processes and enhance</u> <u>outputs.</u>

Human Capital:

The oil and gas industry is a capital-intensive industry concentrated in a few cities in the United States. Heavily regulated, the industry has traditionally been comprised of employees from similar backgrounds.

Caucasian Baby Boomer men aged 55 and older are the most dominant demographic within the oil and gas industry. The lack of representation is further burnished in the industry with an oft heard motto: "Hire to retire"³. Suggesting many employees are hired and retained for the duration of their careers, there are many who have been with the same company for 20-30 years. In many cases these are employees comfortable in their current position who are not seeking promotions. This creates a challenging environment for younger or newer employees who may seek leadership roles within these companies.

² Oil and Gas Industry Overview <u>https://www.schedulereader.com/blog/oil-and-gas-industry-overview</u>

³ 2020 Oil and Gas Consumer Insights Team Survey

Our independent survey research indicates that oil and gas companies often struggle to recruit talent within the current hiring process structure. Relying on outside contractors, recruiting agencies, and individuals from various business units to lead the recruiting efforts instead of creating new structural HR pipelines, companies are not able to reach potential candidates with consistent branding. This may reduce the quality of candidates participating in the recruiting process and can increase the interview timeline life cycle. Throughout the recruitment process, it is critical for candidates to connect with both their interviewer and the brand. We also recognize that it has become standard practice for the recruiting pipeline to focus its efforts on target schools, typically the same programs attended by senior leaders resulting in a pipeline of talent which very much looks like and shares the same experiences of the dominant industry demographics. As demonstrated by multiple McKinsey studies, ethnic diversity and gender diversity result in a 35% and 15% improvement in financial performance above industry medians⁴, this sparks the need to *deploy* a new recruitment strategy.

As the Baby Boomers enter retirement and leave the oil and gas industry, there is a noticeable age gap as Millennials and Gen Z begin their oil and gas careers. Data suggests that younger employees no longer stay at firms their entire career. They often leave after 5 years and are more willing to move around from location to location in order to pursue a career which will allow them to be their authentic selves and capture more competitive benefits that align with their interests.⁵ In addition, these individuals often face challenges bringing innovation into the workplace. The oil and gas industry is notoriously and necessarily heavily process-driven and risk-averse. As a result, our research indicates that new technology recommendations, especially those made by younger generations, are viewed skeptically by management. Additionally, even when these tools are approved, the need to succeed is high, failed projects may cost employees their jobs. This environment seems to stifle employee innovation and has resulted in younger candidates seeking work in more seemingly open-minded industries.

⁴ Why Diversity Matters, Vivian Hunt, Director McKinsey's London office - <u>https://www.mckinsey.com/business-</u> <u>functions/organization/our-insights/why-diversity-matters</u>

⁵ 2020 Oil and Gas Consumer Insights Team Survey

Anecdotally, we recognize that as industries begin to adapt to the diversity of Millennials and Gen Z, many companies are implementing a more open, casual dress code, for example only requiring a collared shirt. Millennials and Gen Z view this type of company culture signaling as a major statement of a company's willingness to adapt to the changing times and welcome them.

When surveyed⁶, diverse Millennials and Gen Z individuals currently view the oil and gas industry as:

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

Out of 37 women, only one viewed the oil and gas industry positively and 21 out of 65 men viewed the industry positively⁷. The primary interests' candidates had in pursuing a career in the industry were: the opportunity to be hired for technical roles, obtaining a role with a high starting salary, the notion of job security, and an opportunity to work in the sustainable energy sector. Overall, there is talent in the market, but it will take significant company investments to shift the internal culture to accommodate the new generation of diverse talent and allow them to thrive in the technology driven future of oil and gas.

Digital Transformation

Digital transformation, the process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements⁸, has captured the imagination, vision, and expectations of companies and industries across the spectrum. Large traditional companies in mature industries are not the exception. Many of these traditional companies have already taken steps in the direction of digital transformation. The question is how far along they are in their digital transformation and

⁶ 2020 Oil and Gas Consumer Insights Team Survey

⁷ 2020 Oil and Gas Consumer Insights Team Survey

⁸ What Is Digital Transformation? <u>https://www.salesforce.com/products/platform/what-is-digital-transformation/</u>

the steps they can take to achieve digital maturity or digital leadership defined as the ability to build digital innovations and drive enterprise transformation⁹ within their respective industries.

A publication by the MIT Sloan School of Management titled "The Digital Advantage: How digital leaders outperform their peers in every industry"¹⁰ defines four levels of digital maturity: Beginners, Conservatives, Fashionistas, and Digirati. A company's position in one of these defined quadrants is determined by two critical dimensions of digital transformation: digital intensity and transformation management intensity (see exhibit 3). In order to be a digital leader, a company must become a Digirati, the quadrant with the most digital and transformation management intensity.

For Super Oil and Gas Company to better understand how it fits within this framework and how to best assess what it should do to become a Digirati moving forward, definitions are in order starting with the critical dimensions of Digital Transformation and then the four quadrants.

- **Digital Intensity:** investments in technology to effect changes in customer engagement, internal operations, and business models.
- **Transformation Management:** creating leadership capabilities to drive digital transformation.
- **Beginners:** familiar with workflow maximization tools such as Enterprise Resource Planning (ERP) or e-commerce, but do not have enough transformation management to effect change with their digital investments.



Exhibit 3¹¹

⁹ Capgemini Consulting, MIT Sloan Management, The Digital Advantage: How digital leaders outperform their peers in every industry

¹⁰ Capgemini Consulting, MIT Sloan Management, The Digital Advantage: How digital leaders outperform their peers in every industry

¹¹ Capgemini Consulting, MIT Sloan Management, The Digital Advantage: How digital leaders outperform their peers in every industry

- **Fashionistas:** have adapted many of the trendy technologies without an understanding of how they fit into their business model and business strategy. Hence, they do not achieve the benefits of digital transformation.
- **Conservatives:** knowledgeable of the need to have the management, processes, and culture in place to achieve digital transformation, but are risk-averse about implementing new technology leading them to miss valuable opportunities.
- **Digirati:** have "the digital maturity not only to build digital innovations, but also to drive enterprise-wide transformation."¹²

To understand the benefits or competitive advantage that a company can achieve by moving quadrants it is helpful to understand the proportion of quadrants by industry (see exhibit 2). Using the manufacturing industry as a proxy for oil and gas we find most companies within the industry are in the beginner quadrant (45%) while only a small minority (12%) are considered Digirati's. As we look across industries, manufacturing (i.e. oil and gas) has the second smallest number of Digirati's. There is ample opportunity for SOGC to create a competitive advantage by moving to the Digirati quadrant.





¹² Capgemini Consulting, MIT Sloan Management, The Digital Advantage: How digital leaders outperform their peers in every industry

¹³ Capgemini Consulting, MIT Sloan Management, The Digital Advantage: How digital leaders outperform their peers in every industry

Embrace, Revamp, *Deploy*: Crafting the Strategy for SOGC Digital Leadership

When considering SOGC's digital transformation objectives, "increased productivity, safer operations, and significant cost savings through digitization", the team believes that SOGC belongs in the Conservative quadrant of digital maturity. As a digital Conservative, SOGC is in a strong position to become a Digirati and carve-out a competitive advantage in oil and gas as one of the industry's few Digirati's.

It is important to establish that in the oil and gas industry and the context of digital transformation, it is not technology that creates competitive advantages. Instead, <u>sustainable</u> <u>competitive advantages arise from what an organizations' people and culture do with the</u> <u>technology - the new capabilities that are created.</u> Since the new capabilities created through digitization efforts can impact both internal operations and external customer engagement, powerful information systems (IS) and marketing leadership should be in place to transform the capabilities into positive financial performance.

With a clear understanding of the digital transformation matrix, its dimensions and quadrants (exhibit 1), and sources of competitive advantages and corresponding functions, we propose our "*Embrace*, *Revamp*, *Deploy*" framework to guide SOGC to digital leadership:

- *Embrace* inclusive and creative leadership
 - Integrate the Chief Information
 Officer (CIO) into the Top
 Management Team (TMT) to best
 achieve Informational System (IS)
 strategic alignment
- *Revamp* the recruiting and retention pipeline
 - Reinvigorate Culture and People
- *Deploy* smart capital into easy to use technologies
 - Assess the technological landscape and create an Oil and Gas toolkit
 - Reframe technology around new capabilities
 - Internal Operations
 - Customer Engagement
 - Ensure a Market Orientation through the CMO
 - Quantify and communicate financial performance with key metrics

As we work through the steps of "*Embrace*, *Revamp*, *Deploy*", keep in mind the following quote on what separates Conservative's from Digirati's,

"Conservatives and Digirati perform well on the four components of transformation management intensity. What separates Digirati, however, is Vision. Where Conservatives focus on control and alignment, <u>Digirati have also developed a strong transformative vision that</u> <u>energizes employees to make change happen</u>"¹⁴.



¹⁴ Capgemini Consulting, MIT Sloan Management, The Digital Advantage: How digital leaders outperform their peers in every industry

Leaders, Culture, and People set the Digital Trajectory

"Who will we attract and retain to lead in this new era of tech innovation?"

The CIO, Culture, and Shared Vision

For a strategy to be effective and take hold it must be a business level strategy. Digital transformation as a business level strategy needs a champion in the Top Management Team (TMT); the Super Oil and Gas Company leadership team is composed of the CEO, CFO, CMO, and other executive roles. The best person for the role of champion is a Chief Information Officer (CIO) who has moved beyond the role of looking after the Information Technology (IT) infrastructure and is now focused on how to maximize technology for business growth¹⁵. The purpose of the CIO in the TMT is to create a shared vision and achieve Information Systems (IS) strategic alignment (defined as "applying information technology (IT) in an appropriate and timely way and in harmony with business strategies, goals, and needs"¹⁶. An MIS Quarterly Executive publication called "How to Develop a Shared Vision: The Key to IS Strategic Alignment" ¹⁷ identifies six mechanisms for achieving a shared vision between the CIO and TMT. These mechanisms are replicated below with the purpose of helping SOGC *embrace* an inclusive and creative leadership team and achieve IS strategic alignment.

- A shared language of business: The right CIO for this role must be able to speak in business terms, not in IT terminology. A CIO with an MBA/MSIS dual degree who has come up through the organization would be a good fit for this role.
- Visioning Network Hierarchy: In order to be successful, digital transformation needs to be headed by a CIO that is a central member of TMT and works collaboratively with the CEO. This arrangement "enables the CIO, to understand the strategic needs of the business and the "mindset" of the TMT". ¹⁸

¹⁵ What Does the Future Cio Role Look Like? Cristina Lago - <u>https://www.cio.com/article/3300761/what-does-the-future-cio-role-look-like.html</u>

¹⁶ J. N. Luftman and T. Brier

¹⁷MIS Quaterly Executive, How to Develop a Shared Vision: The Key to IS Strategic Alignment

¹⁸ MIS Quaterly Executive, How to Develop a Shared Vision: The Key to IS Strategic Alignment

Example of General Motors TMT below for reference:



- **CIO Educational Leadership:** The CIO must educate the TMT who individually may overestimate or underestimate the capabilities of IT. A successful CIO educates, manages expectations, and creates a realistic picture of IT capabilities. These activities, in turn, lead to a shared IT vision.
- Common Interests Between the CIO and TMT: An underappreciated aspect of creating a shared vision is the sharing of common interests. These can be interests around "common hobbies or cultural/extracurricular interests".¹⁹
- **CIO Strategic Knowledge:** A CIO's strategic IT knowledge speaks the CIO's ability to couple IT knowledge with a firm's business strategy and competitive landscape. This strategic knowledge is key to the CIO providing educational leadership in business terms.
- **CIO Relational Capital:** This mechanism speaks to the CIO's trustworthiness. The CIO will be called upon to make IT investments in order to develop IT capabilities. With so much at stake, the TMT must be able to trust the CIO to educate them in order to make the optimal digital transformation decisions.

With the CIO integrated in the TMT and IS strategic alignment achieved, developing a pipeline to execute the shared vision is key. The recruiting and retention pipelines need a *revamp* to address the needs of the company at this critical juncture of the digital transformation process.

¹⁹MIS Quaterly Executive, How to Develop a Shared Vision: The Key to IS Strategic Alignment

Human Capital Playbook

Overall, Super Oil and Gas Company has the opportunity to enhance the culture of digital transformation within the organization. We believe the narrative shift starts with a top down approach and will take a strong leader to navigate the intricacies of technology and innovation. The CIO selection and strategy implementation will be a significant piece of the cultural shift taking place in the business to drive a culture around digital transformation and company diversity which achieves industry superiority when fully executed. Our recruiting plan involves the following process steps: <u>Retention, Resource Planning, Identify Metrics, Outreach & Awareness, and Conversion & Selection.</u> The details of our plan are as follows:

Retention:

Objective: The goal is to increase and *embrace* representation of Millennial, Generation Z and diverse talent in SOGC's 27k employee base. Once onboard, SOGC will make a concerted effort to retain this diverse and valuable talent beyond the 5-year benchmark which is common among younger generations. As the recruiting process evolves, we want SOGC to maintain top talent as they embark on their digital transformation journey.

Key Activities:

- **Building an Inclusive culture:** To build an inclusive culture the organization must understand what talent gaps exist and what steps can be taken to cultivate an inclusive environment. In AMPE's assessment, inclusion implies employees feel as though they are a part of something special where their work has purpose and their identity is respected and embraced. A mentorship platform would ensure employees trust the business leaders in charge.²⁰ These are all key elements to *revamp* and build a strong company culture with inclusion as the centerpiece.
- **Transparency in Pay:** To further build a culture of trust and reduce bias in bonuses and promotion, we assert that pay transparency would help retain top talent. There has been a

²⁰ The Top 8 Reasons Employees Stay With a Company Jodey Cheyne - <u>https://www.oakstone.co.uk/new-blog/2018/8/10/the-top-8-reasons-employees-stay-with-a-company</u>

recent shift in the tech space with companies disclosing employee pay²¹ and believe SOGC can take this radical step in the industry to elevate their brand identity with both in-house talent and prospective employees. We believe transparency will allow the organization to *embrace* the TMT and emphasize a commitment to pay equality, a challenging issue for diverse talent across all industries. ²² We anticipate improved retention and coincidentally improved recruiting conversation rates from perspective candidates when SOGC's TMT aligns itself with this initiative and takes the lead in the oil and gas industry on such a pivotal issue.

- Recognition Awards: Internal rewards tied to monetary bonuses are important as a motivator and in generating employee buy-in for their roles in completing missions. When an employee believes they have gone above and beyond for their business unit, they should be given the chance to complete a presentation for the committee created to evaluate the projects across the business. Employees will be allowed to enter multiple a year, giving each employee a chance to highlight their projects to decision-makers. The recognition focused approach will also combat the perception of stifled innovation in the industry.
- Develop Diversity Leadership Rotational Program pipeline: Although we do understand that engineers get the opportunity to rotate throughout the company into multiple positions within the oil and gas industry, we believe that there are many opportunities to *embrace* nurturing non-engineers. We believe it is valuable to create functional discipline experts, in order to execute on the digital transformation vision, it is critical that employees are exposed to other areas of the company. As degrees continue to evolve with the skillsets that enable growth, we believe SOGC should *revamp*, and recruit from STEM certified degree programs which integrate technology into their learning. In addition, many programs are moving towards dual majors allowing you to obtain an MBA and a Master's of Science in Information Systems (MSIS) degree within two years. We believe that candidates recruited directly from these programs as well as

²¹ Intel Is the First Company To Share Detailed Pay Disparities. It's Not Flattering https://www.latimes.com/business/story/2019-12-10/intel-pay-disparities

²² Gender Pay Gap Ratios, Stats and Infographics 2019 <u>https://www.payscale.com/data/gender-pay-gap</u>

from diverse backgrounds and experiences are the ideal candidates for a new rotational program. The program will provide them with core skills in multiple verticals and allow them to add value beyond a siloed area within the SOGC organization. We expect leadership to provide direction and support to candidates in this program allowing them to lead a global team during a rotational timeline which we anticipate lasting between 3 and 5 years. Ultimately providing experience in areas ranging from financial analysis and planning to asset allocation and product marketing will keep employees engaged and willing to extend their careers with the company.

Employee Resource Planning:

Objective: To coordinate between internal business units to create a committee that is diverse and representative of unique talent which will support digital transformation initiatives.

Key Activities:

• What is the target company demographic? The

oil and gas industry lacks diversity in the roles

that are seen as more technical such as engineering positions, which are heavily composed of white men. In evaluating the future demographic composition of SOGC, an alignment between the CIO and TMT (which is traditionally composed of Caucasian men) is necessary of digital transformation objectives and demographic realities. Recent energy



industry employment data shows under indexing with all races except Caucasian relative to the U.S. Population which is 60.4% Caucasian, 13.4% Black, 18.3% Hispanic, and 5.9% Asian 2% two or more races ²⁴. In our analysis the current U.S. Demographic is our measuring stick for the evolution of diversity internally at SOGC.

²³https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd928c61/t/5c7f3708fa0d6036d7120d8f/1551849054 549/USEER+2019+US+Energy+Employment+Report.pdf

²⁴ U.s. Census Bureau Quickfacts: United States <u>https://www.census.gov/quickfacts/fact/table/US/PST045218</u>

- What is the order of our priority when it comes to sourcing talent? More diverse talent can be hired in the industry. In our assessment, diverse talent includes Millennials and Generation Z, women, LGBTQ+ talent, physically challenged candidates and ethnic minorities such as Blacks, Hispanics, Asians, and Indians. We believe the resource committee developed should establish a hierarchy of where to focus their time on in the interim and assess the steps needed to grow. Our long-term goal is for SOGC to reflect the United States demographics. In order to achieve this in the short term we anticipate focusing on *revamping* recruitment efforts of college and graduate candidates, especially those from diverse backgrounds. Each year we plan to review the outcomes and reshape our efforts to ensure we participate in diversity recruiting conferences and events, developing a stronger presence on campuses outside of just engineering programs.
- What gap in internal capabilities do we currently have? While interviewing multiple employees within the oil and gas industry ranging from Shell and Chevron to Exxon, we identified there is a reoccurring theme in the employees: typically engineers who rotate through multiple positions within the organization such as Marketing, Trading, Finance, Refinery, and the Rigs. Although we commend the effort to provide a breadth of experiences to engineers, they appear to maintain similar mindsets and often are risk-averse, directly affecting the way ideas are implemented on the team. Therefore, we believe *embracing* external non-engineering talent will assist with filing the gap identified when it comes to the functional ability to incorporate new technology and understanding best in practice approaches. Combined with our proposed retention focused rotational program, we believe Super Oil and Gas Company will be viewed as a digital transformation leader.
- What is our internal structure to source talent? Within the Human Resources (HR) field, the best practices is for recruiters to be siloed, focused on specific population segments they are well versed in assessing. Diversity and Inclusion (D&I) recruiting, Undergrad University Recruiting, MBA Recruiting, New Hire Recruiting, and Experienced recruiting for example. There will certainly be overlap but it is very important to create pipelines within the organization to allow personnel to be effective.

Ideally a D&I recruiter should work across all verticals to ensure diverse candidates are given opportunities within all recruiting channels. SOGC should support the budgetary needs of these leaders and allow them to bring innovative tools such as software which reduces bias from resume reviews to the role through the acceptance of approaches that may at times be unfamiliar to TMT.

Identify metrics to track

Objectives: To reduce hiring time and maintain the quality of diverse candidates within SOGC. *Deploying* more streamlined HR roles will position SOGC to maintain Human Capital initiatives when trying to resolve the recruitment timeline challenges.

Key Activities:

• Average cycle time to hire: The current time to hire for employees is 28.8 days within the energy sector, this is the third-highest average only beaten by aerospace and the government. From a talent perspective, candidates are a hot commodity, and time can be of the essence when it comes to recruiting them. In recruitment, the largest issue is the lack of uniformity in recruitment and process. By adapting a consistent internal HR structure for

Industries with longest interview processes		Industries with shortest interview processes	
Government	53.8	Restaurants &	10.2
	days	Bars	days
Aerospace &	32.6	Private	11.6
Defense	days	Security	days
Energy &	28.8	Supermarkets	12.3
Utilities	days		days
Biotech &	28.1	Automotive	12.7
Pharmaceuticals	days		days

Exhibit 6²⁵

Data via Glassdoor's 2017 survey

sourcing talent SOGC will be able to shrink their timelines significantly and cultivate a brand of transparency, industry leadership in technology transformation and a more direct approach to diversity recruitment.

• Internal/External Research: Consumer insights is a huge part of evaluating how your employees are currently feeling about their job. Our research identified that there is a gap

²⁵ 5 Hr Challenges Facing the Oil and Gas Industry <u>https://www.corbanone.com/5-unique-hr-challenges-facing-oil-gas-industry/</u>

in technology experience as most employees are younger than 35 or older than 55. Essentially, there are technological advancements that younger employees were exposed to during their education, external research, or previous company that they continue to promote within their new role. Unfortunately, the older generation is likely at a professional standstill and are not promoting new technology. Ultimately over time this has created a gap in the technological advancement within the organization. This is why *deploying* the CIO position is so essential to supporting technological growth within the workplace and influencing all employees response to innovation and challenges within the industry.²⁶

Outreach & Awareness

Objective: Raise awareness of the technological transformation taking place within Super Oil and Gas Company and how these internal developments will allow the company to excel and attract top talent.

Key Activities:

- Social Media Content Creation: Demonstrate the impact digital transformation has on the oil and gas industry and highlight why it is an exciting time to be a part of the industry. Further raise awareness by *embracing* the diversity in the workplace and emphasize the work being done to promote employee grow within the organization. Seek traditional talent and diverse candidates to celebrate social media posts which share employees journeys on platforms such as LinkedIn, Instagram, Twitter, and Channels like Hulu, and Starz. This approach provides awareness to individuals eliminating negative chatter and promoting positivity around the industry and the work being done.
- Organize Annual technology-focused service project with HBCUs (Historically Black Colleges & Universities): This approach will allow SOGC to positively impact the communities filled with potential talent and provide a platform to connect organically with students at an early point in their career when they are still trying to envision their

²⁶ 5 Hr Challenges Facing the Oil and Gas Industry <u>https://www.corbanone.com/5-unique-hr-challenges-facing-oil-gas-industry/</u>

future. Super Oil and Gas Company can provide advice on the importance of *deploying* technology and recommend courses and skillsets to learn while in school shaping the students' understanding of the oil and gas industry's digital transformation. This will also create an opportunity to build brand equity with diverse programs improving the perception of the oil and gas industry.

• Oil & Gas sponsored Diversity Consortium: This will be a conference that will be hosted in Houston, Texas at a premier hotel where all expenses will be covered by the company. An invite only event for individuals across the U.S. with an emphasis on regions where oil and gas is not prominent. The consortium event will take place twice a year, first for students and the second time for external hires. During the consortium event, SOGC can partner and share expenses with peers such as Chevron, Shell, and BP who have a commitment to diversity and digital transformation initiatives. The consortium will allow Super Oil and Gas Company with brand-building workshops to demystify the oil and gas industry and highlight the great work being done along with the challenges the industry faces. During our survey analysis, we identified transparency as being a key trait an employee will look for and this approach will allow them to learn firsthand about the business while also getting to network with a diverse set of employees within the industry.

Application Conversion & Employee Selection

Objective: Enhance the recruiting pipeline by seeking vertical experts to support the hiring process by evaluating candidates. This further, *embraces* functional experts who are well versed in technology transformation who also *embrace* diversity initiatives to assist with the interview process.

Key Activities:

• **Presentation of company values and pride:** This will allow the candidates to identify how they can incorporate their personality and identity into the company culture and better assist with the evaluation process. Given the negative perception of the oil and gas industry, it is important that Super Oil and Gas Company carefully assess the culture being cultivated with each hire. Focusing on the unique aspects of each candidate will

help foster an inclusive community. These presentations allow SOGC to visualize how candidates fit within the business, assessing their alignment with the vision of *<u>Innovating</u>*

Energy for an Inclusive Future.

- Scaling back initial information within the Application process: While there are key metrics companies use to evaluate candidates, some companies have a long drawn out application process which can be a deterrent to candidates. To avoid this, SOGC should *revamp* their approach implementing a resume drop with a 200-word statement on where they see the future of digital transformation within oil and gas. After being selected we believe letting the job candidate interview a person from the team or a colleague that works within the business to assess the culture and the team dynamic is important as this is a key aspect for candidates when making career decisions.²⁷
- **Case Interview presentations:** Case interviewing will allow the hiring committee to more deeply understand the current skill set of the candidate and narrow decisions more effectively. The case information can be provided to the candidate in advance and layout a current business situation so that SOGC can assess their thought process when addressing the problem. This also allows the company to engage and incorporate dialogue and project focus in valuable business areas such as digital transformation.

Resource
PlanningIdentify
Metrics to
TrackOutreach &
AwarenessConversion
& Selection

Perspectives for SOGC Digital Competencies

With the CIO established in the TMT and the talent pipeline strengthened, the next step is to make sure the role of the Information Systems (IS) department is well defined and aligned with the firm's business strategy. In the case of Encana, an Oil and Gas company that underwent a digital transformation, it set out guiding principles around the responsibility of value creation,

²⁷Study: Most Job Seekers Abandon Online Job Applications Dave Zielinski-

https://www.shrm.org/resourcesandtools/hr-topics/technology/pages/study-most-job-seekers-abandon-online-job-applications.aspx

data handling and cloud computing, and digital competencies. We layout Encana's process and decisions below as a lens through which SOGC can envision how it will *deploy* its digital transformation as it seeks to become a Digirati.

Value Creation Responsibilities: How is responsibility for creating value through digitization shared between the CIO and potential business units?

• Encana decided to decentralize its governance with IS professionals working directly with Business Unit (BU) Managers. This arrangement protected the interest of each BU along with ensuring solutions that meet the needs of each business unit. Additionally, it allowed for IS staff to be embedded with the BU, "learning the business and participating in providing practical and innovative solutions."²⁸ This type of learning will prove critical as digital transformation evolves at SOGC.

Data Handling and Cloud Computing: How is the data shared and presented between BU's?

- Encana determined that data would be made available anytime/anywhere to provide realtime data to "Encana's network, which facilitated contract analysis (and) the production of key performance indicators."²⁹
- Encana also determined that data would be presented in its most useful form (provide decision-makers with data that provides a comprehensive picture of events and processes). This strategy was set forth for both internal and external partners. The purpose of sharing and presenting data to external partners was to promote "greater collaboration among partners (to) lower everyone's costs (to) the benefit (of) gas customers."³⁰

²⁸ Kohli, Rajiv and Johnson, Shawn (2011). "Digital Transformation in Latecomer Industries: CIO and CEO Leadership Lessons from Encana Oil & Gas (USA) Inc.," MIS Quarterly Executive, 10.4 (December), 141-156

²⁹ Kohli, Rajiv and Johnson, Shawn (2011). "Digital Transformation in Latecomer Industries: CIO and CEO Leadership Lessons from Encana Oil & Gas (USA) Inc.," MIS Quarterly Executive, 10.4 (December), 141-156

³⁰ Kohli, Rajiv and Johnson, Shawn (2011). "Digital Transformation in Latecomer Industries: CIO and CEO Leadership Lessons from Encana Oil & Gas (USA) Inc.," MIS Quarterly Executive, 10.4 (December), 141-156

Digital Competencies: What are my core IT competencies that I want to remain in-house and focus my resources around?

 Encana differentiated between efficiency-creating IS and strategy-enabling IS, deciding to retain strategy-enabling IS and outsource efficiency-creating IS. The reasoning behind this decision was that "outsourcing frees up resources for use on strategic IS planning...and become more responsive to market demands."³¹

To *revamp* and enhance internal competencies, like efficiency-creating IS, SOGC can look to collaboration, joint ventures, and/or acquisitions of 3rd-parties. A few examples are provided below.

Collaboration vs Joint venture or equity investment in tech-oil firm

Digitalization cannot be accomplished in a silo and solely by SOGC. As mentioned earlier, most employees at SOGC are engineers in petroleum or other support functions. The company's mission and core competencies are in the extraction and refinery of oil and gas. As such SOGC could partner with a technology company that solely focuses on developing digital solutions and tools to enhance its core competency or make an equity investment in a startup that is developing these capabilities with the end goal of acquiring the startup later on in its maturity phase.

• Collaboration with Technology company: Virtual reality and automation have proven to help several industrial companies improve safety and develop an emergency plan. Virtual reality and automation in the oil and gas industry can help employees interact with the offshore oil rig and plant maintenance. A recent trend in the industry is noted herein by the February 2018 Digitalist magazine edition: "Many oil and gas organizations have already started to experiment with Virtual Reality. California-based PG&E, for example, has already invested in the technology to help improve its operations. PG&E operates more than 150,000 miles of transmission and distribution lines running across remote and inaccessible areas, and virtual reality holds great promise to help improve

³¹ Kohli, Rajiv and Johnson, Shawn (2011). "Digital Transformation in Latecomer Industries: CIO and CEO Leadership Lessons from Encana Oil & Gas (USA) Inc.," MIS Quarterly Executive, 10.4 (December), 141-156

maintenance efficiency of these assets."³² SOGC can partner with a 3rd-party firm to gain the same capabilities and *deploy* smart technology in their oilfield.

- Invest in Technology startup: To attract and retain the top minds in technological innovation in the oil and gas industry, SOGC should consider making an inventory of current technology company products that could be used to improve the safety, health, and environment of their employees offshore and onshore. SOGC should also recognize that innovation is a shared effort with the right partner. The firm should also identify a list of tech startups firms that are focusing solely in oil and gas. SOGC could consider investing in one of the following three startups:
 - **Tachy**: The company provides the technology that is required for oil and gas producers to make data-driven decisions. The Tachyus platform integrates the data from all possible sources and identifies the most optimal solution for all the operations. The company uses data physics: a combination of physical modeling and machine learning.
 - Dynamo: Dynamo turbines are specifically designed for the oil and gas industry and are far more efficient than the legacy reciprocating engines. They result in higher meantime between failures (MTBF) and a significant reduction in the scheduled downtime.
 - Waterlens: This company was selected as one of the energy innovation pioneers in 2018. Hydraulic fracturing is one of the most effective methods to produce oil from shale formations. The conventional process of laboratory testing takes about three to seven days, but Water Lens' solution provides results in less than 10 minutes. This handy technology saves time and prevents a lot of damages and maintenance costs.

With a framework and lens with which to view its own digital competencies, SOGC can proceed to evaluate the digital technology landscape. Using this framework SOGC can determine which technologies it can *deploy*, combined with its *revamped* human capital and culture, to create new digital capabilities that lead SOGC to digital leadership.

³² How Virtual Reality Can Drive Efficiency In The Oil & Gas Industry <u>https://www.digitalistmag.com/digital-supply-networks/2018/02/08/virtual-reality-drive-efficiency-in-oil-gas-industry-05844767</u>

<u>The Technology – Oil and Gas Toolkit</u>

"What technological tools will be used?"

With the enhancement of its human capital structure, Super Oil and Gas Company must ask itself what tools it will use to *embrace* the opportunity to lead the oil and gas digitization landscape. As we have seen when examining the Digirati, the objective of digital transformation and subsequent leadership is to capture the real business benefits of technology. While it is easy to purchase new hardware and software and hire various technologically savvy individuals, it is a bigger challenge to *revamp* and fully integrate them into a business model which is already up and running while ensuring to optimizes the investments lead to outperforming peers. Technological opportunity is rooted in the toolkit a company has decided to use. Turning to research completed by the World Economic Forum³³, there are many areas of technological and

digitization focus on the horizon for oil and gas companies. We believe that the key to digital leadership in oil and gas lies in the three areas of primary investment: big data analytics, IoT and mobile devices. Additionally, there are quite a few tangential components which will fortify Super Oil and Gas Company's top position.



³³ World Economic Forum January 2017 white paper - https://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-oil-and-gas-industry-white-paper.pdf

³⁴ World Economic Forum January 2017 white paper - <u>https://reports.weforum.org/digital-transformation/wp-</u> content/blogs.dir/94/mp/files/pages/files/dti-oil-and-gas-industry-white-paper.pdf

These tools AMPE has identified for Super Oil and Gas Company's success comprise the Industry 4.0 movement (Exhibit 8^{36}) which anticipates increased production efficiency, reduced waste and decreased costs for companies through the combination of multiple emerging technologies and will position SOGC

to lead the energy industry push towards digital transformation.

Exhibit 8³⁵ **The Four Industrial Revolutions**

Industry 2.0 Mechanization and the introduction of steam

Industry 1.0

and water power

Mass production assembly lines using electrical power

Automated production, computers, IT-systems and robotics

Industry 3.0

The Smart Factory Autonomous systems. IoT, machine learning

Industry 4.0

Exhibit 9³⁷

The potential savings for oil and gas companies are projected to be \$150B each year, particularly in the production capital expenditure arena. A recent CNBC report, echoes the research done by the World Economic Forum and outlines that savings will be generated by a tremendous expenditure shift towards Artificial Intelligence, Big Data, IoT, Mobile Devices and Cybersecurity (Exhibit 9³⁸)

Oil and gas companies prioritizing AI and big data

Share of oil and gas companies focusing on various digital investments over the next 3-5 years, according to an Accenture survey



³⁵ World Economic Forum January 2017 white paper - https://reports.weforum.org/digital-transformation/wpcontent/blogs.dir/94/mp/files/pages/files/dti-oil-and-gas-industry-white-paper.pdf

³⁶ Industry 4.0 and How Smart Sensors Make the Difference Spectral -

https://www.spectralengines.com/articles/industry-4-0-and-how-smart-sensors-make-the-difference ³⁷ Industry 4.0 and How Smart Sensors Make the Difference Spectral -

https://www.spectralengines.com/articles/industry-4-0-and-how-smart-sensors-make-the-difference ³⁸ Tech and energy are teaming up, creating a market that could grow 500% in the next 5 years https://www.cnbc.com/2020/02/22/tech-and-energy-are-teaming-up-creating-a-market-that-could-grow-

500percent-in-the-next-5-years.html

The Cloud

Cloud storage is a foundational element of the technology toolkit we recommend. Without the ability to store data remotely, oil and gas companies will be forced to invest in large scale server hardware which would deplete capital budgets for other purposes and shift critical talent away from innovation within the company as they would be forced to maintain the servers.

We recommend the SOGC CIO focuses their attention on identifying a failsafe cloud provider such as Amazon Web Services (AWS) within the first year and migrate all data storage to the cloud. This will provide a cost savings to the company whole and preserve resources for the digital transformation. For context, 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 automation³⁹.

Each tool we outline requires a strong cloud platform and we advise this is the top tech priority for the CIO before launching into developing the toolkit.

Big Data and Analytics

The oil and gas industry produces terabytes of data every day ⁴⁰, and <u>the overarching challenge</u> 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.

³⁹ Richard H Holsman, Managing Director Accenture, "WHAT'S DRIVING THE OIL AND GAS MARKET TO CLOUD"

⁴⁰ Beyond the Barrel: How Data and Analytics Will Become the New Currency in Oil and Gas

Brad BechtoldJune - https://gblogs.cisco.com/ca/2018/06/07/beyond-the-barrel-how-data-and-analytics-will-become-the-new-currency-in-oil-and-gas/

Pattern recognition is a valuable component

of the move towards digitization. Leveraging the data collected creates new opportunities for both innovative data collection tools and for companies, such as the startups we hope to partner with, who are on the cutting edge of technological innovations. The main types of data currently collected

(Exhibit 10^{41})



throughout the oil and gas supply chain are: seismic data, drilling data, and well production data. Each of these data points involves the use of complex and expensive infrastructure creating opportunities for improved collection and integration.

Capital expenditure spending has dropped by approximately 25% since the 2014 oil and gas crisis and as a result, companies have truly been doing more with less and leveraging their data to maximize their outputs and move towards a predictive maintenance model that will allow them to forgo costly capital expenditures especially given the notoriously low-profit margins within the industry of $8-9\%^{42}$.

Industrial Internet of Things (IIoT)

Internet of Things (IoT) technology allows for systems of interrelated computing devices, machines and objects to stay connected and transfer data across networks without human input. Within the \$250B

Chris Walters- Denodo Technologies - http://www.datavirtualizationblog.com/efficiency-in-the-energy-sector-pumping-the-value-out-of-data/

⁴¹ Beyond the Barrel: How Data and Analytics Will Become the New Currency in Oil and Gas Brad BechtoldJune - <u>https://gblogs.cisco.com/ca/2018/06/07/beyond-the-barrel-how-data-and-analytics-will-become-the-new-currency-in-oil-and-gas/</u>

⁴² Efficiency in the Energy Sector: Pumping the Value Out Of Data

global IoT (which is expected to grow to \$1.6T by 2025) ⁴³ lies the \$100B Industrial IoT (IIoT) market of which oil and gas is a subset expected to reach \$39.4B by 2023⁴⁴.

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. (Exhibit 9⁴⁵)The oil and gas industrywide adoption rate is expected to increase the global GDP by as much as \$816B over the next decade.



Data: Inmarsat / Chart: ZDNet

Exhibit 11⁴⁶

The main challenge with IoT is that there are numerous tools and assets to interconnect which may create new challenges on both the technological and user experience side. Within the oil and

⁴³ Iot Market Size Worldwide 2017-2025 Statista Research Department

https://www.statista.com/statistics/976313/global-iot-market-size/

⁴⁴ Global lot in Oil and Gas Market Is Projected To Reach To \$39.40 Billion By 2023

BIS Research - https://www.prnewswire.com/news-releases/global-iot-in-oil-and-gas-market-is-projected-to-reach-to-39-40-billion-by-2023-813704047.html

⁴⁵ The Industrial Internet Of Things: A Guide To Deployments, Vendors and Platforms Charles McLellan <u>https://www.zdnet.com/article/the-industrial-internet-of-things-a-guide-to-deployments-vendors-and-platforms</u>
 ⁴⁶ Iot Market Size Worldwide 2017-2025 Statista Research Department

https://www.statista.com/statistics/976313/global-iot-market-size/

⁴⁷ What Is the Industrial Internet Of Things? Essentials Of liot

Jon Gold - https://www.networkworld.com/article/3243928/what-is-the-industrial-internet-of-things-essentials-of-iiot.html

gas industry, there are numerous opportunities to expand the use of IoT (Exhibit 10⁴⁸) and the key opportunities lie in better process management. From safety to improved inventory management, IoT is expected to lead to improved industry production of 6-8%.

The preferred method of IoT transformation involves applying durable wireless sensors to assets to better manage them within a system. Sensor connectivity should either be on a BLE low-power protocol similar to Bluetooth or Zigbee another wireless network with capabilities for tens of thousands of connected nodes⁵⁰. While most IIoT solutions had been customer enterprise solutions, there are an increasing number of out of the box IIoT solutions, applying sensors and launching systems for new assets should be seamless. The need to bring legacy assets online may pose short term challenges, but once all assets are on a single system, monitoring and programming will lead to new insights.

Automation:

According to Frost and Sullivan's 2018 research⁵¹, the fall in crude oil price was one of the catalysts for the increase in automation. Digitizing oil fields involved investing in tools and equipment which

would increase productivity and allow companies to complete projects within budgets and timelines.



USING IOT IN OIL AND GAS

IoT devices are beneficial for minimizing risks and carrying out demanding operations seamlessly.

oT helps cut down on checks as it can monitor pipelines in real time.

The oil and gas companies can improve their production by 6% to 8% with proper utilization of the

ow Powered Wide Area Networks provide an nexpensive solution for offshore oil and gas rig

IoT provides real-time ship and fleet monitoring.

IoT can help bring down the number of fatalities to a greater extent.

IoT helps lower the environmental footprint generated by oil drilling and production operations.

Drilling management

Pipeline monitoring

Refinery monitoring

Offshore monitoring

iata provided by IoT

Cargo shipping

Health and safety

Carbon footprint control

⁴⁸ Refining The Oil And Gas Industry With lot - Naveen Joshi-

https://www.forbes.com/sites/cognitiveworld/2019/09/17/refining-the-oil-and-gas-industry-with-iot/#74e0b62b79f9

⁴⁹ What Are Wireless lot Sensors And Why Are They Useful- https://www.iotforall.com/what-are-wireless-iot-sensors-why-are-they-useful/

⁵⁰ What Are Wireless lot Sensors And Why Are They Useful- <u>https://www.iotforall.com/what-are-wireless-iot-</u> <u>sensors-why-are-they-useful/</u>

⁵¹ Automation in Oil and Gas Industry Sullivan - <u>https://ww2.frost.com/frost-perspectives/automation-oil-and-gas-industry/</u>

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.

As part of the midstream process, changes in the supervisory control and data acquisition (SCADA) can improve efficiency by using software to better manage how extracted resources are transported to storage facilities and beyond. Leveraging data to automate processes based on various levels of pressure or chemical reactions can also reduce the risk of human error.

Downstream, refinement, and pricing can be automated based on inputs provided by interconnected systems that have been able to analyze millions of data points based on everything ranging from the type of oil being refined to the weather in the location of the gas pump.

Artificial Intelligence (AI):

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.⁵² 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

⁵² Oil and Gas Companies Turn To Ai To Cut Costs Neanda Salvaterra - https://www.wsj.com/articles/oil-and-gascompanies-turn-to-ai-to-cut-costs-11571018460

as algorithms, which help provide data scientists with insights and solutions such as ways to reduce emissions.

Furthermore, AI and ML technology can be used to retain the expertise of skilled employees within oil and gas companies who may be retiring. This information can be fed into automation processes or stored in the cloud for the future development of new tools and training materials for new and incoming staff.

Mobile:

Based on our research, there are opportunities for two types of mobile hardware which Super Oil and Gas should capitalize on: mobile devices and wearables. These tools are directly connected to the rise of big data, and IIoT.

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.

Mobile devices such as cell phones and tablets allow for easy access to data in the field. There are opportunities to provide training to employees of varying levels both in the field and in the office by using mobile devices. *Deploying* mobile devices will allow employees to feel as though they are part of something bigger and truly fulfilling the mission of <u>Innovating Energy for an</u> <u>Inclusive Future.</u>

In line with the notion of ongoing connectivity, wearable technology, such as smartwatches, helps to monitor the health and safety of critical staff working in hazardous fields. By tracking the movement and vital signs of employees in the field, oil and gas companies are able to identify literal pain points and prevent dangerous conditions for their employees. These devices also provide critical data back to the CIO and TMT, such as time spent on particular tasks and processes, which can be used to optimize future capital investments.

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.

Within the oil and gas industry, being able to cross-examine and analyze data across distinct phases of the oil and gas lifecycle is critical. Tools such as Denodo ⁵³ allow users to view consolidated real-time data across platforms and make critical decisions in the moment. This automatically creates savings on the capital end as companies can minimize and optimize hardware expenses for; large scale computer buildouts and also allows more users to visualize and provide feedback on complex processes from various locations and steps within the supply chain.

The Technology – Evolving Quickly Through Smart Capital

Across the oil and gas industry, there are numerous tools already identified for enhancing outputs and better leveraging current operations. We believe that Super Oil and Gas Company can *embrace* these tools to evolve quickly by making smart investments which will lead to positive short- and long-term outcomes.

- **Data Analytics:** Beginning with big data and analytics, we believe that in combination with seeking out new startup data technology, Super Oil and Gas Company can provide data analytics training tools to all staff to leverage the 99% of outstanding data to build innovative tools and solutions during company Hackathons.
- **HoT:** In order to optimize Industrial IoT, SOGC should *deploy* a large-scale durable sensor-based turnkey solution, giving Millennials and Gen Z staff the chance to co-lead the legacy asset transformation which will be integrated into the recommended rotational program. This will allow staff from varying levels of asset management the chance to manage IIoT solutions across the entire supply chain. For example, staff from the upstream unit who had been managing rig IIoT devices can rotate to upstream gas pump IIoT technology after 6 months.

⁵³ Denodo, "Data Virtualization for Oil and Gas Companies"

- Artificial Intelligence: We believe that Super Oil and Gas should increase spending and training in artificial intelligence and machine learning technology to better leverage data insights and subsequently reassign freed up capital to data analytics training programs. These programs will evolve into companywide opportunities where staff from any business unit can receive certification in data analytics by completing training modules on mobile devices.
- Virtualization: On a large scale, in order to internally promote and expand knowledge of the SOGC platforms to new and non-traditional users and use cases, we recommend *embracing* virtualization operations to create opportunities for the company to reduce spending on complex and expensive infrastructure and provide additional touchpoints for staff development and retention by learning new platforms and facets of the industry.

The Technology - Customer Engagement

To become a Digirati SOGC must elevate its vision "Beyond the Barrel" towards new digital capabilities *deployed* in customer engagement. The term "Beyond the Barrel" is borrowed from the World Economic Forum's report on Digitization in the oil and gas industry. In the report, WEF sets the scene for potential disruption at-the-pump from newcomers to the Oil and Gas industry. Disruptions include digital customer services, omnichannel retail, and experiential services⁵⁴.

- **Digital Customer Services:** on-demand services have changed the way customers engage with companies (time and place). Now on-demand fueling options are on the rise with startups like Booster Fuels, focusing on enterprise-level relationships to bring the service to enterprise employees. Business models like Booster Fuel's mean that customers are no longer reliant on fixed fueling stations.
- Omnichannel Retail and Experiential Services: For customers visiting retail pumps large opportunities exist to improve their visit experience, cross-sell them, and bundle additional services. Potential services include "digital banking or allowing customers to

⁵⁴ World Economic Forum January 2017 white paper - https://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-oil-and-gas-industry-white-paper.pdf

pick up parcels bought online"⁵⁵. This omnichannel approach has an added benefit of deeper customer understanding and insights. Kwik Chek is a company that has been experimenting successfully with omnichannel retail.⁵⁶

The highlighted trends bring focus to the large revenue potential for meeting customers changing expressed and latent needs which have attracted new competitors and business models. Unless traditional players like SOGC take this threat seriously they will experience revenue losses at the pump and from missed opportunities from add-on services. To mitigate this risk, SOGC should supplement the CIO with a strong marketing department and CMO which can explore and *deploy* new digital capabilities around customer engagement.

Marketing Power - Creating New Digital Capabilities

Literature establishes the benefits of marketing department power on firm performance. Marketing department power has been found to be positively associated with short-term future profitability (ROA: Return on Assets), long-term future shareholder value (TSR: Total Shareholder Return), and a company's "ability to use available resources to build and maintain brand equity and customer relationships"⁵⁷. A feature of marketing department power is the creation of the firm's market orientation (the activities of market information acquisition and dissemination and the coordinated creation of customer value⁵⁸. Market orientation positively impacts organizational performance through two main mechanisms: customer and innovation as described below. Exhibit 13⁵⁹ illustrates the correlation between market orientation and organizational performance.

⁵⁶ World Economic Forum January 2017 white paper - https://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-oil-and-gas-industry-white-paper.pdf

⁵⁵ World Economic Forum January 2017 white paper - https://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-oil-and-gas-industry-white-paper.pdf

⁵⁷ Feng, Hui, Morgan, Neil A., and Rego, Lopo L. (2015), "Marketing Department Power and Firm Performance," Journal of Marketing, 79 (September), 1-20

⁵⁸ Narver, John C. and Slater, Stanley F. (1990), "The Effect of Market Orientation on Business Profitability," Journal of Marketing, 20 (October), 20-35

 ⁵⁹ Kirca, Ahmet H., Jayachandran, Satish, and Bearden, William O. (2005), "Market Orientation: A Meta-Analytic Review and Assessment of Its Antecedents and Impact on Performance market orientation," Journal of Marketing, 69 (April), 24-41

- **Customer:** superior perceived quality, customer loyalty, and customer satisfaction with a firm's products and services. This is achieved through the ability to anticipate customer's latent needs.
- Innovation: superior ability to "create and implement new ideas, products, and processes, and new product performance⁶⁰. This is achieved through the mechanism of the customer –understanding customers latent needs in conjunction with more data on customer behavior and better use of that data.





A market orientation feeds innovation because it builds "sustainable customer relationships that span the trajectory of customers' needs through customer data acquisition, maintenance, and use." Further, because market/customer knowledge is a time-intensive attribute and therefore spread across groups of people, it is immune to codification or imitation by competitors. <u>This</u> <u>embeds competitive advantages into the capabilities of the firm which are then translated into new innovative products and/or services</u>.

This serves to reinforce our assessment that for SOGC to become a Digirati it needs to have innovative capabilities and solutions that address both internal operations and customer engagement. To accomplish this goal SOGC needs a CIO and CMO represented and supported

⁶⁰ Feng, Hui, Morgan, Neil A., and Rego, Lopo L. (2015), "Marketing Department Power and Firm Performance," Journal of Marketing, 79 (September), 1-20

⁶¹Feng, Hui, Morgan, Neil A., and Rego, Lopo L. (2015), "Marketing Department Power and Firm Performance," Journal of Marketing, 79 (September), 1-20

in the TMT, working collaboratively toward a common shared vision. By doing so, SOGC will reap the financial performance rewards of a Digirati.

New Digital Capabilities and Financial Performance

Now that Super Oil and Gas Company is on Digirati footing, the question becomes whether management has the key performance indicators and metrics to help make better and more timely financial decisions. Will the Digitalization investments allow the TMT to determine which refinery process upstream, mid and downstream are most efficient? Which smart capital investments and *deployments* have had the greatest positive impact on the firm financial performance we assessed how *embracing* digitalization improves key financial metrics, reduces cost in the short and long term, enables better revenue management, improves capital efficiency, and positions SOGC to be the market leader.

Financial metrics: Earnings growth and ROIC

Return on invested capital (ROIC) measures the TMT performance by looking at how they have used the capital invested by shareholders and the debt borrowed to generated additional revenues. This profitability ratio will allow SOGC to evaluate how much return the firm will generate based on capital



invested in this digitalization effort. A study from MIT Sloan reveals that firms with stronger digital intensity, Digirati, derive more revenue from their physical assets.

Exhibit 14⁶²

⁶² Capgemini Consulting, MIT Sloan Management, The Digital Advantage: How digital leaders outperform their peers in every industry

All else equal, digitalization will increase SOGC's revenue which will increase its ROIC. The question remains whether it will also increase firm value in the long term for its shareholders and what its duration will be. A truly great business must have an enduring "moat" that protects excellent return on invested capital"⁶³ Warren Buffet notes in his 2007 shareholder letter.





By developing a firm-wide digitalization strategy, SOGC will establish itself as the leader in the oil and gas industry and will generate positive spread. A positive spread is realized when the firm ROIC is above its cost of capital (WACC). To increase shareholder value in the long term, SOGC should evaluate each capital investment in digitalization and ensure that the firm can achieve both positive spread and asset growth.



ROIC is a function of both revenue maximization and a cost leadership strategy. SOGC recognizes revenue as the amount it expects to receive when its customers have taken control of the oil, gas and/or other products it has to offer. The amount of revenue that must be recognized for oil and gas is contingent on the market price. Although it is important to increase the top line, we have seen in the recent news that oil prices market indices can fluctuate significantly, and management does not have much control over this metric. As a result, management revenue estimates may not be met when oil prices fluctuate. To address bottom line concerns, Super Oil

⁶³ Warren Buffet - 2007 shareholder letter

⁶⁴ Professor Sreenivas Kamma, valuation creation, Kelley School of business

and Gas Company's TMT can also use digitalization tools such as enhanced expense reporting tools *deployed* on mobile devices and to track cost-effectively and decide which costs are not valued-added because they do not increase SOGC's ROIC.

Exhibit 16⁶⁵



Exhibit 17⁶⁶

Cost reduction

Investing in digitalization will reduce costs in the short and long term. On February 22, 2020 CNBC highlighted an important technological trend in the energy sector as most firms are seeking help from tech companies to streamline their process. The article estimates that

"the oil-focused digital services

industry will grow from less than \$5

\$150 billion in annual savings for oil producers

Total estimated savings from implementing and utilizing digital services



billion today to more than \$30 billion annually over the next five years in the upstream market alone, leading to \$150 billion in annual savings for oil producers"⁶⁷

Conjointly, "Executives that make their organizations more digital will be well-positioned to pursue new growth opportunities." ⁶⁸ SOGC's investment in digitalization, especially in

could-grow-500percent-in-the-next-5-years.html ⁶⁷ Tech and Energy Are Teaming Up, Creating a Market That Could Grow 500% in the Next 5 Years Pippa Stevens - https://www.cnbc.com/2020/02/22/tech-and-energy-are-teaming-up-creating-a-market-thatcould-grow-500percent-in-the-next-5-years.html

 ⁶⁵ World Economic Forum/Accenture analysis, Digital Transformation Initiative: Oil and Gas Industry
 ⁶⁶ Tech and Energy Are Teaming Up, Creating a Market That Could Grow 500% in the Next 5 Years
 Pippa Stevens - https://www.cnbc.com/2020/02/22/tech-and-energy-are-teaming-up-creating-a-market-that-

⁶⁸ lot and the Digitalization Of Oil and Gas Production - <u>https://pgjonline.com/news/2017/11/iot-and-the-</u> <u>digitalization-of-oil-and-gas-production</u>

advanced analytics tools for predictive maintenance, could reduce costs up to 13% based on a study made by McKinsey & Company. We expect that digitalization will reduce both maintenance and operational costs

- **IoT and robotization:** As elaborated in the Industrial IoT section above, IoT, advanced data analytics and predictive reasoning will enable SOGC to identify, control and analyze large data sets from physical asset sensors *deployed* in the field and help with the maintenance cycle. An analysis by the Pipeline & gas journal reveals how *embracing* and *deploying* smart capital in the oil and gas industry allows for more a preventive maintenance. The article states "With up to 70 percent of pipeline leaks only identified by visual inspection, use of sensors and analytics can help spot compressor, valve, and pipeline maintenance issues before problems become catastrophic." ⁶⁹Additionally, "Research firms estimate that using data analytics could help improve oil and gas production by 6 and 8 percent" ⁷⁰. The operation of upstream and midstream facilities requires periodic maintenance of equipment used. Often oilfield equipment is either under serviced leading to premature failure and unplanned downtime or over serviced leading to increase costs and reduced equipment life. IIoT will be valuable for SOGC as it will enable the firm to establish a maintenance schedule based on actual (real-time) conditions.
- Continuous improvement (Kaizen): Kaizen costing is a methodology used to establish processes to identify waste in the production cycle and eliminate related costs. In order to reduce cost, SOGC needs to *deploy* smart capital to centralize all the data using a firm-wide digitalization strategy. Thereafter, the firm will be able to *revamp* its financial reporting tools and reports. This new trend often allows the firm financial analysts to have a clear view of the entire production cost structure and generate smart and dynamic reports that will allow the TMT to decide which processes could be eliminated because they are not value added and not essential. Kaizen costing is a team effort and an

⁶⁹ Iot and the Digitalization Of Oil and Gas Production - <u>https://pgjonline.com/news/2017/11/iot-and-the-</u> <u>digitalization-of-oil-and-gas-production</u>

⁷⁰ Iot and the Digitalization Of Oil and Gas Production - <u>https://pgjonline.com/news/2017/11/iot-and-the-</u> <u>digitalization-of-oil-and-gas-production</u>

enterprise-wide strategy. In most successful cases, companies that have incorporated a Kaizen costing approach have set up a digitalization process to support this strategy. Studies from the Pipeline oil and gas magazine suggests that digitalization could cut operating costs in upstream by 3 to 5 percent and by about half that in downstream⁷¹. Using localized data gathered from the oilfield along with predictive analytics will result in increased efficiency and improved business outcome and overtime reduction which could lower cost by 5-25%. Overall reducing both maintenance and operation costs will increase ROIC (all else equal) and will contribute to the value creation for SOGC shareholders.

Revenue management

In the marketing power section above, we demonstrated that embracing digitalization will allow SOGC to better understand its customer's latent needs and develop innovative solutions to address them. As a result, SOGC will be able to generate more sales and control its revenue budget with our integrated digitalization strategy. In 2017, Simon-Kucher performed a global pricing & sales study which revealed that investing in digitalization to improve a process or cut costs is great, but it will not help acquire more customers or generate additional revenue from an existing one. "Process improvements often take years before they lead to noticeable results and drive up costs before the reductions become tangible. Laying the foundation is an important step, yes, but all the action is happening on the commercial side: customer experience, new products and services, and smart monetization models"⁷².

Profit Drivers				
Change	Change in Profit			
1% decrease	<u>4%</u> % increase			
1% decrease	<u>16%</u> % increase			
1% increase →	<u>20%</u> % increase			
1% increase	4 [%] % increase			
	Profit Drivers Change 1% decrease 1% decrease 1% increase 1% increase			

Exhibit 18⁷³

In order to continue to create shareholder value, SOGC should focus the digitalization strategy on improving customer experience and drive the top-line revenue while reducing its cost. This approach will improve SOGC 's ROIC in the long run.

⁷¹ Iot and the Digitalization Of Oil and Gas Production ... <u>https://pgjonline.com/news/2017/11/iot-and-the-digitalization-of-oil-and-gas-production</u>

⁷² MONETIZING DIGITALIZATION – BOOSTING REVENUE AND PROFITS IN A DIGITAL WORLD - <u>https://www.simon-kucher.com/sites/default/files/2018-02/brochure_Monetizing%20Digitalization_final.pdf</u>

⁷³ Professor Rockney Walters, Marketing department, Kelley School of Business

We clearly can see that focusing on revenue in the digitalization approach generates higher profit for the firm in both cases mentioned above. A study conducted by McKinsey & Company on Digitalization in oil and gas companies reveals a new trend. "By using geospatial analytics, for example, executives are increasing the efficiency of their supply and distribution networks through

Exhibit 19⁷⁴



Making a Case for the Importance of Pricing

Source: The Price Advantage, Marn, Roenger, and Zawada

location planning and route optimization." ⁷⁵This digital-enabled strategy has increased revenue by 3%. (Exhibit 16⁷⁶)

Capital efficiency

Each of the top five oil and gas companies has invested heavily in upstream fixed assets in the past and are continuing to invest. These investments take several years before exploitation can begin. Research from McKinsey on the digitalization of oil and gas companies reveals that "the effective use of digital technologies in the oil and gas sector could reduce capital expenditures by up to 20 percent"⁷⁷. Additionally, oil and gas companies that have integrated digital applications into their oilfield "have been able to increase their reservoir limits significantly, resulting in a

⁷⁴ Professor Rockney Walters, Marketing department, Kelley School of Business

⁷⁵ The Next Frontier For Digital Technologies in Oil and Gas - https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-next-frontier-for-digital-technologies-in-oil-and-gas

⁷⁶ The price advantage, Marn, Roenger, and Zawada

⁷⁷ The Next Frontier For Digital Technologies in Oil and Gas- https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-next-frontier-for-digital-technologies-in-oil-and-gas

decrease of up to 20 percent in upstream and downstream capital expenditures." ⁷⁸ The same report identifies a new trend, "the use of 4-D seismic imaging to add a time-lapse dimension to traditional 3-D imaging, enabling them to measure and predict fluid changes in reservoirs. This enhanced view of reservoirs typically increases the recovery rate by as much as 40 percent, boosting upstream revenue by up to 5 percent." ⁷⁹

Embrace, Revamp, Deploy: The next Five Years

In order to make the strategic shift toward digitation while continuing to recruit and retain underrepresented talent, SOGC should implement the following 5-year plan.

SOGC 5 YEAR PLAN



2020: First, SOGC should *revamp* their application process to make sure they vet talent efficiently and effectively around digital transformation and values. After implementation, SOGC should *embrace* external hiring, focusing on integrating diverse talent into the TMT as the CIO is a considerable part of SOGC's vision to become a Digirati. After bringing in a new CIO, SOGC can invest in *deploying* diversity initiatives to recruit diverse talent primed for innovation. *Embracing* the transparency around the work being done and the values represented by the mission: <u>Innovating Energy for an Inclusive Future</u> is essential. As the CIO is at the helm of leading the digital transformation, SOGC should explore the necessary financial

⁷⁸ The Next Frontier For Digital Technologies in Oil and Gas - https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-next-frontier-for-digital-technologies-in-oil-and-gas

⁷⁹ The Next Frontier For Digital Technologies in Oil and Gas - https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-next-frontier-for-digital-technologies-in-oil-and-gas

investments required to remain competitive and become a superior leader in the oil and gas digital transformation space.

2021: SOGC should dig deeper into their talent development initiatives. We believe it's the essential time to cultivate and *deploy* a community of analytically strong personnel across the organization. Also, SOGC should explore launches in other areas like IoT and enhance their data analysis and AI technologies to allow the rotational program members to grow their technical knowledge with the best tool kit. This toolkit relies on leveraging the latent 99% of data already collected and better integration with mobile devices and virtualization tools across the company.

2022: SOGC should continue to explore new technological advancements to *deploy* as technology has shorter life cycles. As part of this phase, SOGC can look to collaboration, joint ventures, and/or acquisitions of 3rd-parties. These initiatives should be focused around its efficiency-creating information systems. Potential targets are Tachy, Dynamo, and Waterlens, as mentioned in "Perspectives".

2023: *Revamping* scaling programs will be the next step to help make sure that digital transformation becomes integrated into everyone within the organization's career development program. Additionally, SOGC will continue to evaluate its current customer segment as their digital competencies in year four will position them to deliver new digital capabilities around customer engagement. New digital capabilities such as digital services, omnichannel retail, and experiential services.

2024: In the last year of the 5-year plan, SOGC should evaluate their current KPI on all the implemented approaches to improve their overall digital transformation well-being. KPIs including profit margins and working capital will make way for customer and employee satisfaction metrics. With KPI's in order, SOGC can continue to enhance the software capabilities that have allowed the organization to assert its superiority and effectively enhance its Oil and Gas business through technology.

Embrace, Revamp, Deploy: The Final Verdict

In order to ensure Super Oil and Gas Company takes the lead on the \$150B digital transformation initiative, our comprehensive analysis has emphasized the need to first focus on the short- and long-term vision and strategy, with a preference for outside the box ideas. Driven by leadership and company culture, once the strategies are established, we determined a need to improve the recruiting pipeline to ensure the inclusion of diverse talent on both the recruiting and retention fronts. With a creative and inclusive team onboard and in the pipeline, we worked to

provide an oil and gas industry technology toolkit which will advance the digital transformation mission. Finally, after transformation decisions and tech investments have been made, we lay out financial measures and company metrics to ensure our digital investments are establishing the company as a true digital leader internally and externally.

In conclusion, we believe that our analysis has identified the key pillars and pathways for Super Oil & Gas (SOGC) to achieve digital leadership while increasing the underrepresented talent they recruit and retain. Our three-pronged approach relies on:

- 1. *Embrace* inclusive and creative leadership as we demonstrated through the enhanced role of the Chief Information Officer (CIO) to lead SOGC to Digirati status
- 2. *Revamp* the recruiting and retention pipeline as advised through the implementation of new strategies focused on the value of diverse talent and creating new opportunities for growth and retention which enhance SOGC's digital leadership status
- **3.** *Deploy* **smart capital into easy to use technologies** to better leverage the oil and gas toolkit into output production and employee productivity gains.



Exhibit 20⁸⁰

<u>diverse talent and emerging technologies into a seamless system that will be at the forefront</u> <u>of employee feedback loops and industry technological changes. Super Oil and Gas will</u> <u>lead the movement to Innovating Energy for an Inclusive Future.⁸¹</u>

⁸⁰ World Economic Forum/Accenture analysis, Digital Transformation Initiative: Oil and Gas Industry

⁸¹ Industry 4.0 and How Smart Sensors Make the Difference