HfS Blueprint Report

Energy Operations 2017
Excerpt for NTT DATA

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Executive Summary

Introduction to the HfS Blueprint Report:
Energy Operations

- The HfS Research Blueprint Report for Energy Operations provides a comprehensive overview of services for the oil and gas industry. This Blueprint looks at business process outsourcing, information technology outsourcing, and engineering services across the oil and gas value chain areas of upstream, midstream, and downstream, and cross value chain BPO and engineering and ITO services.

- This report analyzes and reviews how the market is evolving toward more business-outcome focused, flexible, and collaborative services, and how service providers are meeting the needs of oil and gas clients.

- The HfS Blueprint includes profiles and assessments of 13 service providers of energy operations services.

- Unlike other quadrants and matrices, the HfS Blueprint identifies relevant differentials between service providers across a number of facets in two main categories: innovation and execution. The assessment of the 13 service providers is reflected on the HfS Blueprint Grid.

- The HfS Blueprint Grid recognizes up-and-coming service providers (High Potentials) that are scoring higher on innovation criteria than on execution criteria as the providers build these practices. The Grid includes a group of established, high-execution service providers (Execution Powerhouses) that have built effective delivery operations but need to innovate capabilities and offerings further. They are in addition to the rankings for highest overall performance (Winners Circle), and strong combined innovation and execution performance (High Performers).

Oil and Gas Value Chain: Business Processes, IT, and Engineering

Upstream	Midstream	Downstream		
Exploration, Development, and Production	**Transportation**	**Refining**	**Distribution**	**Marketing and Retail**
• Asset management • Asset integrity management • Digital oil field management • Drilling and well completion management • Petro technical computing infrastructure • Reservoir engineering • Upstream accounting • Upstream engineering and R&D • Production optimization • Upstream data management • Field development and planning and contract management	• Linear asset management (pipeline operations, modelling, surveillance) • Transportation operations management • Supply and trading	• Emission management • Integrated refinery information systems • Plant operations • Refinery production planning and scheduling • Supply planning and sourcing	• Terminal operations • Distribution management	• Energy marketing services • Retail and franchise operations • Energy trading and risk management

Cross Value Chain BPO and Engineering

Analytics (customer, marketing, asset), capital project management, customer experience management, digital transformation services, field force and workforce management, finance and accounting (including complete hydrocarbon accounting), HR and learning, knowledge management, legal services, MRO services, PLM services, procurement, product design and engineering services, sales and fulfilment services

Cross Value Chain ITO

Application development and maintenance services, end user computing services, enterprise content management, environmental, health and safety systems, GIS services, IT operations, IT security management, mobility and IOT services, SAP/Oracle oil and gas ERP implementation and management

HfS Value Chain Definition: *Value chain refers to the series of departments that carry out value-creating activities to design, produce, market, deliver, and support a company's product or service. In this usage, we refer to the range of primary processes and support services that providers offer to their clients.*

Key Highlights – State of the Energy Operations Market

- **Energy is in a Perfect Storm:** The term "Perfect Storm" is used to describe an event in which a rare combination of circumstances drastically aggravates the outcome. The world of energy (both the oil and gas industry and utility industry) is in a Perfect Storm. Rising social and political pressure in conjunction with technology advances and economic shifts are combining to create a positive atmosphere to address the energy transition in order to lower carbon emissions, one of the biggest challenges of the coming decades. This energy transition will have tremendous impact on the oil and gas industry, and the impact is felt today and will be amplified over the next decades.

- **The Rise of Natural Gas:** Natural gas has replaced coal as the cheapest source for power generation. It's not only much cleaner, it's now also cheaper. Solar and wind have become economically competitive alternatives, with many wind and solar projects now cheaper than generating power from coal, oil and even natural gas. In any case, the demand for natural gas continues to grow and it is seen as a bridge fuel in the energy transition, and is a big driver for the North American shale revolution.

- **"Lower for Longer". Dealing with Sustained Lower Price Environment:** In 2016, the oil price reached lows of under $30 per barrel. Now the price of oil has rebounded to around $50 per barrel. In a world of high oil prices and cash abundance, most oil and gas companies let inefficiencies exist. Now there is a strong imperative to find new efficiencies, optimize production, decrease capital needs, and take advantage of data. In 2017, the name of the game for oil and gas still is: Figuring out how to operate in a "lower for longer" environment and be profitable with the oil price between $45 and $55 per barrel. This means fixing the basics and leveraging new technologies by investing in digital transformation and new operating models. Service providers play a role here, bringing more efficiency into processes, fueling innovation, implementing new technologies, and preparing oil and gas clients for a new era.

- **Innovation Rapidly Becoming a Hygiene Factor in Energy Operations:** Service providers are expected to incorporate innovation in services and constantly bring the cutting-edge of technology to the client's attention as the focus shifts on the capabilities that truly extend clients' operations.

Key Highlights – State of the Energy Operations Market

- **Outsourcing and Automation Are Key Levers:** As the focus of the industry continues to be on cost reduction, production optimization, and operational efficiency, automation and outsourcing are two principal levers available to the industry. Oil and gas executives are forced to have a good look at their strategy. In the 2016 Blueprint we noticed leaders asked themselves these key questions:

  - What is the core of our enterprise?
  - What do we need to do internally that differentiates us from the competition?
  - What parts of our processes can we automate?
  - Can we outsource what we can't automate?

  In 2017, the effect is noticeable in the priorities of oil and gas executives, the expectations they have of service providers, and the emphasis on automation in engagements. Now, new questions are added:

  - How do we speed up digital transformation?
  - Who are the right partners to drive digital transformation?
  - Who are the credible innovation partners for us?

- **Buyers' Perception of Service Providers Becoming More Strategic:** A pivotal changing dynamic in the market is how buyers look at their service providers. With the renewed focus on outsourcing as a lever to deal with the pressures in the volatile business environment, oil and gas clients tell us they look beyond labor arbitrage and see service providers as an extension of their organization. They want deeper relationships with their providers and to forge stronger ties between internal and external staff. They look at their service provider(s) to help the organization become more flexible and scalable, ramping up and down in the cyclical business of oil and gas.

- **Proactive Innovation:** Service buyers HfS interviewed during the Blueprint research process expressed a desire for more proactive innovation from their service provider. Clients want their service providers to be innovation partners, driving new ideas and engaging on all levels of the client organization.

Key Highlights – State of the Energy Operations Market

- **Heterogeneous Providers Focus on Diverse Client Needs:** Most of the 13 service providers covered in this Blueprint have a unique set of offerings and capabilities for addressing clients' needs. There are a couple of clusters of expertise to be identified in the field of service providers. Some, like HCL, focus on a specific area of the value chain, others, like TCS, Infosys, NTT DATA, LTI, Wipro, Accenture, IBM, and Cognizant, focus on strong domain expertise and consulting-led delivery while others, like EPAM, Atos, Luxoft, and Tech Mahindra, lead with engineering or digital transformation with credible experience from other industries.

- **Intelligent Automation Is on the Rise:** Robotic process automation (RPA) and Autonomics are widely used technologies in energy operations, for instance in back-office and mid-office business processes like procurement, finance and accounting, HR, and infrastructure maintenance and support. Service providers leading the integration of RPA in engagements are Accenture, Infosys, NTT DATA, HCL, and LTI.

- **Automation Is Used to Offset the Big Crew Change and Loss of Personnel During the Downturn:** The production of oil and gas has rebounded from the slump of 2014-2016, but jobs have not. This is due to new efficiencies in the field, primarily driven by automation. The people who lost their jobs in oil and gas have found new jobs in other industries or have retired earlier then expected. The Big Crew Change has come quicker and automation is picking up the slack.

- **Cyber Security is an Increasing Challenge**. The energy infrastructure has become targets for corporate- and government-backed hackers. There are tremendous vulnerabilities in energy systems. Behavioral models, advanced analytics, automated responses and machine learning are key components of modern security measures designed to operate in a heightened threat environment. Security is recognized as a priority across the industry, but remains an area of concern and needs continued investment from oil and gas companies and Energy Operations service providers.

Key Highlights – State of the Energy Operations Market

- **Partnerships:** No one company can deliver all the services and solutions required for the transformation the oil and gas industry is going through. In the digital age, breaking down silos, creating end-to-end processes and information flows, and unleashing the actionable insights derived from advanced data analytics are critical imperatives for survival. We see this in the convergence of operational technology (OT) and information technology (IT) and by the increasing role of digital platforms across the value chain. Partnerships are therefore becoming a decisive source of value and competitive advantage for oil and gas companies, service providers, software vendors, and original manufacturing equipment providers alike. Partnerships, alliances, and joint ventures form the foundation for the Brokers of Capability role and engagements focused on collaboration and innovation.

- **Client Communities:** Service providers organize client communities and events to facilitate knowledge sharing, peer connections, cross-client and cross-industry learnings, and new idea generation. Clients value these communities tremendously and say they help improve their relationship with the provider. Service providers have an opportunity to cater to these needs even more, making themselves more indispensable to clients who are often struggling with questions around digital technology, intelligent automation, creating new business models, and leveraging advanced analytics. Oil and gas clients are particularly interested in learning from their providers' experiences in other industries, who have gone through similar transformations and are seen as ahead of the curve.

- **As-a-Service Delivery Becoming the Norm, As-a-Service Pricing Is Lagging Behind:** In their quest to become more flexible and agile, buyers are warming up to As-a-Service delivery and engagement models. Reduced capital requirements, focus on business outcomes, and plug-and-play services are attractive, but over half of engagements still start off with an FTE, time and material, or fixed price model with the intent to introduce more transaction or outcome based pricing during the duration of the contract. Hybrid contract are emerging in twenty percent of contracts. Service providers show an appetite to experiment with As-a-Service pricing models, especially in new engagements or when new technology is involved.

Key Highlights – State of the Energy Operations Market

- **Talent Is a Growing Concern and Service Providers Can Plug the Talent Gap**: Oil and gas companies have faced difficulties attracting talent over the past decades. Only a fraction of college graduates consider a career in oil and gas. The crisis in the current market has led to large-scale employee layoffs. The aging workforce will drive what is called the "Big Crew Change". Service providers can play a role in solving the talent problem of the industry. Providers seem to be in a better position to attract younger talent, offering them more diverse career opportunities. The digital revolution in oil and gas also brings a qualitative talent gap; different skills are required. Data scientists, software architects, and engineers are not the traditional oil and gas employee and service providers are able to attract and develop these talents.

- **Large-Scale Deployment of Services Aiming to Bring Down Cost:** Service providers are asked to deliver services with cost saving potential such as applications rationalization, infrastructure optimization, operations analytics for more efficient operations, mobility and social platforms to empower workers, and enabling a smarter and smaller workforce.

- **Plug-and-Play Digital Services Starting to Emerge:** Energy Operations service providers are just beginning to become partners with their clients in developing and deploying Plug-and-Play Digital Business Services. Typically, they have taken the form of analytical applications. We see these services as being at the initial stage of development, with significant progress forecasted over the next few years as service providers become more comfortable with being platform developers.

- **The Big Data and Analytics Impetus:** Big data and data sciences play a more and more far-reaching role in energy operations services as organizations start to realize their big data strategies. Advanced analytics is increasingly embedded in service providers' offerings, enabling the capture and integration of previously disconnected and disparate data in order to create accessible and actionable insights in support of business decisions. While there is no shortage of data in oil and gas companies, data quality is a major obstacle. Availability, consistency, and completeness of data is often a bottleneck for analytics services.

State of the Market: Service Providers

- **As-a-Service Winners** are service providers that are in collaborative engagements with clients, and making recognizable investments in future capabilities in talent and technology to continue to increase the value over time. These providers have a strong oil and gas practice, significant industry-specific expertise, and capabilities.
  - **Accenture, Cognizant, EPAM, Infosys, TCS, and Wipro**

- The **High Performers** all execute well, and are investing in future capabilities. Significant oil and gas industry expertise combined with strengths in technology and a clear vision for the industry and the services needed to incorporate connectivity, security, automation, and analytics into operations.
  - **Atos, HCL, LTI, NTT DATA, and Tech Mahindra**

- **High Potentials** provide niche services in specific areas of the value chain, scoring well on innovation with industry-specific solutions. Providers have a good strategy and technology roadmap and talent development plans, but should incorporate As-a-Service in execution of existing services further.
  - **IBM and Luxoft**

As-a-Service Economy

Use of operating models, enabling technologies, and talent to drive business outcomes through outsourcing. The focus is on what matters to the end consumer.

HfS uses the word "economy" to describe the next phase of outsourcing as a new way of engaging and managing resources to deliver services.

The 8 Ideals of the As-a-Service Economy:

1. Write Off Legacy
2. Design Thinking
3. Collaborative Engagement
4. Brokers of Capability
5. Intelligent Automation
6. Accessible and Actionable Data
7. Holistic Security
8. Plug-and-Play Digital Services

Source: Beware of the Smoke: Your Platform Is Burning by HfS Research, 2015

Key Market Dynamics in Energy Operations

Welcome to the As-a-Service Economy

HfS uses the word "economy" to emphasize that the emerging next phase of outsourcing is a more flexible, outcome focused way of engaging and managing resources to deliver services. Operating in the As-a-Service Economy means architecting use of increasingly mature operating models, enabling technologies, and talent to drive targeted business outcomes. The focus is on value to the consumer.

I. THE OPTIMUM OPERATING MODEL

Outsourcing | Shared Services | GBS | BPaaS/SaaS/IaaS | Crowdsourcing

II. EMPOWERING TALENT TO MAKE IT ALL POSSIBLE
Capabilities over Skills | Defining Outcomes | Creativity | Data Science

AS-A-SERVICE ECONOMY

Agility | Collaboration One-to-Many | Outcome Focus Plug-and-Play Services

TOOLS/INFRASTRUCTURE

GOVERNANCE

IV. TECHNOLOGY TO AUGMENT KNOWLEDGE LABOR

Digitization and Robotic Automation | Analytics | Mobility | Social Media | Cognitive Computing

III. A BURNING PLATFORM FOR CHANGE

Globalization of Labor | High-growth Emerging Markets | Disruptive Business Models | Consumerization

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Journey to the As-a-Service Economy

- Moving into the As-a-Service Economy means changing the nature and focus of engagement between enterprise buyers, service providers, and advisors
- "As-a-Service" unleashes people talent to drive new value through smarter technology and automation

Fixed Assets

Leveraged Assets

Change Management Ideals

Legacy **Economy**

1 **Write Off Legacy**

3 **Brokers of Capability**

2 **Design Thinking**

4 **Collaborative Engagement**

5 **Intelligent Automation**

6 **Accessible and Actionable Data**

7 **Holistic Security**

8 **Plug-and-Play Digital Services**

As-a-Service **Economy**

Solution Ideals
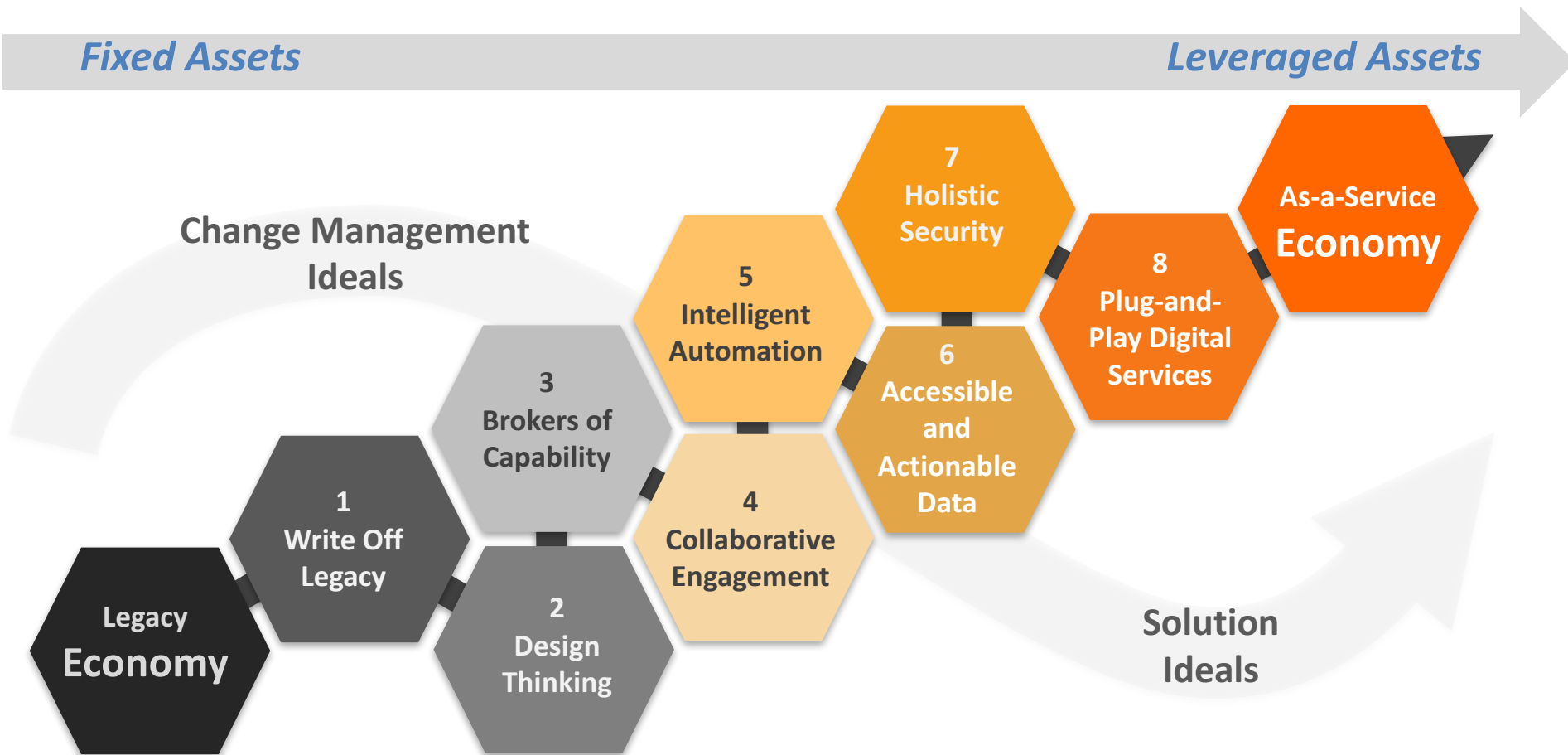
Moving to the Eight Ideals of the As-a-Service Economy

Legacy Outsourcing	Intelligent Simplification	As-a-Service Economy
Legacy technology investments that limit agility and create masses of exceptions addressed through adding internal and external FTEs	**1.** **Write Off Legacy**	Using platform-based solutions, DevOps, and API ecosystems for more agile, less exception-oriented systems
Resolving problems by looking first at the process as the source of the solution	**2.** **Design Thinking**	Understanding the business context to reimagine processes aligned with meeting client needs
Focusing governance staff on managing to the letter of the contract and the decimal points of service levels	**3.** **Brokers of Capability**	Orienting governance to source expertise from all available sources, both internally and externally, to address capability gaps
Evaluating relationships on baselines of cost, effort, and labor	**4.** **Collaborative Engagement**	Ensuring relationships are contracted to drive sustained expertise and defined outcomes
Operating fragmented processes across multiple technologies with significant manual interventions	**5.** **Intelligent Automation**	Use of automation and cognitive computing to blend analytics, talent, and technology
Performing ad-hoc analysis on unstructured data with little integration or business context	**6.** **Actionable and Accessible Data**	Applying analytics models, techniques, and insights from big data in real-time
Responding with post-event fixes; little focus on end-to-end process value chains	**7.** **Holistic Security**	Proactively managing digital data across service chain of people, systems, and processes
Undertaking complex, painful technology transitions to reach steady state	**8.** **Plug-and-Play Digital Business Services**	Plugging into "ready to go" business-outcome-focused people, process, and technology solutions with security measures

Energy Operations Is Beginning to Incorporate the Ideals of the As-a-Service Economy

IDEAL	AS-A-SERVICE IDEAL DEFINITION	NONEXISTENT	INITIAL	EXPANSIVE	EXTENSIVE	ALL PERVASIVE
Write Off Legacy	Using platform-based solutions, DevOps, and API ecosystems for more agile, less exception-oriented systems			**2017**		
Design Thinking	Understanding the business context to reimagine processes aligned with meeting client needs			**2017**		
Brokers of Capability	Orienting governance to source expertise from all available sources, both internally and externally, to address capability gaps			**2017**		
Collaborative Engagement	Ensuring relationships are contracted to drive sustained expertise and defined outcomes			**2017**		
Intelligent Automation	Using automation and cognitive computing to blend analytics, talent, and technology				**2017**	
Accessible and Actionable Data	Applying analytics technologies, processes, and resources on relevant data sets to derive insights that can help improve an enterprise				**2017**	
Holistic Security	Proactively managing digital data across service chain of people, systems, and processes		**2017**			
Plug-and-Play Digital Business Services	Plugging into "ready to go" business-outcome-focused, people, process, and technology solutions with security measures		**2017**			

How As-a-Service Is Taking Shape in Energy Operations: Writing Off Legacy

Legacy technology and physical distribution investments that limit agility and create exceptions addressed through adding internal and external FTEs

→ Using platform-based solutions, DevOps, and API ecosystems for more agile, less exception-oriented systems

1 Write Off Legacy

- Writing Off Legacy for enterprises and service providers in Energy Operations is still largely in the "Expansive" phase. Significant investment has gone into implementing ERP systems and in many cases, customizing these systems. Today, we see a lot of application rationalization to drastically lower the complexity and number of ERPs in the organization. Writing Off Legacy is not about abandoning these systems, but about exploring and using platform-based solutions that integrate with the system of record, making the data more accessible and extensible, and interfacing and integrating with other technologies. Service providers are forming extensive networks of partnerships, providing industry and functional platforms, expertise, and methodologies to enable both technological and change management capabilities and expand their ability to help clients change.

Examples:
- Accenture and Infosys have introduced several models to clients in different phases of maturity regarding writing off legacy and moving to cloud platform based environments. Partners play a key role in providing clients to cloud-based solutions. Accenture helps spin-offs to migrate quickly to a new platform. Infosys offers its IT-As-a-Service model successfully to completely take control of clients' IT, modernizes and migrates it to cloud and delivers it on-demand.
- EPAM and Luxoft are two providers with strong software engineering skills applying DevOps to energy operations engagements. EPAM, for example, has inherited much of its clients' legacy and new application portfolio, with the task to combine, rationalize, and integrate these applications into modern, more sustainable platforms supported by DevOps teams. The next step in Writing Off Legacy is for EPAM to invest in the underlying platforms and accelerators and deliver the solutions with outcome-based pricing.

How As-a-Service Is Taking Shape in Energy Operations: Design Thinking

Resolving problems by looking first at the process as the source of the solution

Understanding the business context to reimagine processes aligned with meeting client needs
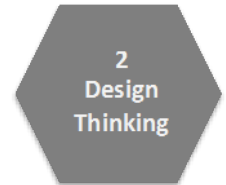
2 Design Thinking

- Design Thinking provides a new way to think and engage as partners. It helps shift the focus of work and engagement from "inside out" to "outside in", starting from the end consumer. Design Thinking can be applied to new engagements, existing engagements, or in search of next level value. Most service providers have adopted Design Thinking in some way, shape, or form and have introduced clients to the concept. We believe this ideal is starting to become "Expansive" in the energy operations engagements but there remains a large opportunity to use Design Thinking as a way to establish joint initiatives and change the nature of engagements. As it takes two to tango, the challenge for service providers is to engage their counterparts in the client organization and entice them to be an equal partner in this process, by showing success with other clients and in other industries and positioning Design Thinking as an new frame of reference for innovative thinking and developing.

Examples:
- Infosys has put Design Thinking at the heart of the company's strategy for developing solutions and managing client relationships. We see evidence of this approach being used, to reimagine processes and service delivery with clients and resulting in a project for large scale exploration of the opportunities for automation with a international oil and gas client. Another example is Design Thinking a seamless onboarding experience for employees of a supermajor.
- Cognizant is an example of a service provider that has been putting Design Thinking and other methodologies to practice in its Co-Innovation Model, a platform where clients, research groups, partners, and Cognizant collaborate to solve complex business problems. One compelling example is the use of Design Thinking and experience design and human-centric design to rethink the nine-to-five process of an oilfield engineer, resulting in better workforce and asset management, and improvement of health, safety, and reliability with an Augmented Reality project.

How As-a-Service Is Taking Shape in Energy Operations: Brokers of Capability

Focusing governance and operations staff on managing to the letter of the contract and the decimal points of service levels

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Orienting governance to source expertise from all available sources, both internally and externally, to address capability gaps

3 Brokers of Capability

- Being a Broker of Capability is about articulating a business problem or opportunity, the desired outcomes, and then coordinating and facilitating across internal and external entities to reach those results. In our research, Brokers of Capability are the oil and gas industry veterans who can look outside the process for current and anticipated needs to deliver business results. Often these results go above and beyond the requirements of the engagement, but are identified as the "sticky" business problems lacking of a sustainable solution. Solving said problems requires intricate knowledge of processes and the capabilities of (new) technologies and partners. In complex environments and ecosystems under pressure of change and volatility, these capabilities are extremely valuable to oil and gas clients and service providers. Given the domain expertise service providers have accumulated, this ideal is "Expansive" in the current market.

Examples:

- NTT DATA brought a global team of internal and external experts from partners such as Intel and Cray, industry experts and representatives from NTT Japan's drone team, NTT i3 and NTT DATA's Energy and Utilities practice together to work on an innovative seismic solution, aiming to reduce the cost profile of seismic capture and delivering higher quality and more frequent insights from the field.
- Cognizant has recently invested in Drone-As-a-Service operator Measure to develop drone services solutions and automating complex asset inspection processes for oil and gas clients.
- TCS captured domain expertise and capabilities in industry specific solutions and blueprints based on industry requirements and clients' desired business outcomes. An example is the Well Factory solution that solves the labor-intensive and time-consuming process of bringing new wells online, including all the work needed to be done putting these wells in dispersed applications across the enterprise. An example of co-creation with a partner, TCS and Cisco are creating a new IoT platform for rig control systems for a global major in drilling services
- Infosys has similar solutions that bring together a wide range of capabilities from within Infosys, clients, and partners to solve previously unsolved industry challenges. SmartOFS for Oil Field Services companies is one example, giving clients an integrated, pre-configured solution that includes templates and accelerators, to reduce time and cost on implementation along with complete standardization of processes specific to oil field services.

How As-a-Service Is Taking Shape in Energy Operations: Collaborative Engagement

Evaluating relationships on baselines of cost, effort, and labor ➡ Ensuring relationships are contracted to drive sustained expertise and outcomes

4 Collaborative Engagement

- The key to a sustainable outsourcing engagement is collaboration, working together to produce a result. Traditionally, outsourcing work has been directive from service buyers to service providers and managed strictly by procurement organizations. As more business units and global shared services centers take responsibility for relationships, HfS is seeing a move over time to more collaboration where trust and experience are in place, often through shared outcomes and results. The adoption of practices of collaborative engagement is "Expansive" in energy operations today as a response to the orientation of the market toward solving challenging business issues and deeper relationships as a result of rounds of consolidation over the last couple of years.

Examples:

- There are several examples of service providers facilitating collaborative engagement between themselves and clients and even with other clients. Notable examples are Accenture's Energy Hubs that are set up across the globe to serve as a showcase of (digital) technologies and inspiration for clients. Cognizant's Collaboratories, part of Cognizant Digital Works, is its investment to accelerate digital and aims to involve clients and partners in innovation. And TCS' Co-Innovation Network (COIN), a three-level model of collaborative engagement with strategic discussions at the senior management level, tactical collaboration between operational managers (supported by a customer engagement portal), and operational reviews at the day-to-day level.

- In addition to the Energy Hubs, Accenture's Innovation Architecture is a model to bring capabilities from its five business units together and forge collaborations between them and with clients to shape new solutions. Accenture Studios, Innovation Centers and Delivery centers, Labs and Centers of Excellence are providing clients with access to R&D and design capabilities that have proven highly valuable.

How As-a-Service Is Taking Shape in Energy Operations: Intelligent Automation

Operating fragmented processes across multiple technologies with significant manual interventions

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Using of automation and cognitive computing to blend analytics, talent, and technology

5 Intelligent Automation

- Automation has become "Extensive" in Energy Operations. We see the application of RPA and Autonomics in several business processes and IT infrastructure and application management. Several industry executives we talked with in our research classify RPA and autonomics in business process and IT as "table stakes" or "bare bones" as the industry looks to reduce headcount, drive efficiency, and increase digital advantage. However, what we call Intelligent Automation—using software and technology to do routine tasks, enhancing it through machine learning and natural language processing, and moving up the curve with artificial intelligence, is far from pervasive at this stage. There are real opportunities in applying Artificial Intelligence and cognitive computing to energy operations but this is in initial stages, which is only logical as this is a rapidly evolving but young field. Service providers leading the integration of RPA in engagements are Accenture, Infosys, NTT DATA, HCL, and LTI.

Examples:

- An example of the value RPA can bring to oil and gas companies is Accenture's implementation of an RPA based automation solution in F&A processes for a leading energy company, resulting in a 67% reduction in average manual handling time and $2.5M cost savings in sales and reporting processes.
- Several service providers show real promise in Intelligent Automation, with TCS's ignio, Infosys' Nia, Wipro's Holmes, and IBM's Watson starting to being applied to energy operations engagements. IBM has an engagement with Woodside in Australia where Watson is employed to use predictive data science to leverage more than 30 years of collective knowledge and experience. Watson is trained by Woodside engineers and makes available the collective expertise in designing, fabricating, and constructing major oil and gas facilities as well as managing major turnarounds to a large number of Woodside employees as a cloud-based knowledge platform appropriately called "Lessons Learned".

How As-a-Service Is Taking Shape in Energy Operations: Accessible and Actionable Data

Performing ad-hoc analysis on unstructured data with little integration or business context

→ Applying analytics technologies, processes, and resources to relevant data sets to derive insights that can help improve an enterprise

6 Accessible & Actionable Data

- Analytics is driving a new wave of transformation in oil and gas. Data is everywhere in energy operations processes. There are huge amounts of historical data, asset data, process data, and project data, and it is growing every day at an staggering rate. Having accessible and actionable data is the future of energy operations. Solutions range from predictive operational analytics, predictive asset analytics, and behavioral analytics in surveillance and security to customer and marketing analytics. These options tie into areas in energy operations where efficiency gains can have huge financial impact such as predictive and prescriptive maintenance and production optimization.

- There are important hurdles around data confidentiality and data quality in the industry. We see several service providers being an active participant in the development of insights rather than a passive data provider in their energy operations engagements. There is room for more expansive roles when clients start allowing the service provider to act more upon the developed data to improve the effectiveness of processes. This is especially true in more industry specific parts of the value chain, closer to the core of the client's expertise and where the IP of the industry is found, such as drilling and well completion, reservoir engineering, and production optimization.

Examples:

- Two exemplary use cases for providing accessible and actionable data to clients' workers are TCS' Data Streams As-a-Service offering and Infosys' Dataroom As-a-Service. The former digitizes and integrates previously dispersed and paper information people spend a lot of time chasing down, then delivers them to the fingertips of field workers and engineers. The latter brings together all the data involved in M&A and divestitures on a secure platform and provides analytics around the data in the due diligence process.

- LTI combines advanced analytics and Industrial Internet of Things, transforming predictive maintenance of complex equipment for an oil and gas client using algorithms for alerts and analytics. Resulting in a 10% reduction of breakdowns and up to $20M of productivity improvements.

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How As-a-Service Is Taking Shape in Energy Operations: Accessible and Actionable Data

Performing ad-hoc analysis on unstructured data with little integration or business context

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Applying analytics technologies, processes, and resources to relevant data sets to derive insights that can help improve an enterprise

6 Accessible & Actionable Data

Examples:

- Cognizant offers an analytics solution for down-hole stick-slip vibration detection using surface data and rig data. The solution helps oil and gas clients to extend the life of down-hole tools by reducing destructive vibrations resulting in significantly reduced maintenance and replacement costs and downtime.

- EPAM takes an end-to-end responsibility for analytics, from capturing data, building data platforms, data lakes, adding data science, and writing algorithms to proving the technology in a full stack approach. One example is analysis of well-related PDF-based photographical data, taken from public domain sources and large data sets, with sophisticated algorithms, feeding insights into the client's resource planning with visualized, map-based views optimized for planning purposes. For an oil and gas major, EPAM developed an Advanced Analysts Platform on a Hadoop/Spark infrastructure. This platform supports the client's Unconventionals Operations, fetching information from multiple systems of record and data sources (internal and external like WellView, Energy Components, and Primavera) and turning the data into dashboards, KPIs, and metrics specific to the client's asset planning, production operations, drilling, and completions in tailored views for disparate business units.

- Wipro, using Analytics as a platform to solve business problems, provides a good example of putting analytics at the center of a new marketing/retail point of sale solution for a US-based chain of service stations. The solution combines analytics of customer behavior, historical data on car maintenance, and buying patterns into recommendations and special offers and can pre-empt new demand. This, in turn, enabled entirely new business models for the client.

- Atos presents a case of data analytics in operations and design for a major oil field services client. The service, running on Atos' Codex data analytics platform, acquires data from a logging while drilling tool (a real-time well site evaluation tool) and analyzes it for data trends. The service gives the client insights into the health of the tool and feeds this insight into maintenance and design, speeding up the re-deployment of the tool significantly. Prior to the solution, it could a take up to month to turn around the tool after failure because of the time spent looking for the cause of failure.

HfS BLUEPRINT REPORTS

How As-a-Service Is Taking Shape in Energy Operations: Holistic Security

Responding reactively with post-event fixes. Little focus on end-to-end process value chains

→

Proactively managing digital data across service chain of people, systems, and processes

7 Holistic Security

- The assets in oil and gas, such as wells, rigs, pipelines, refineries, and tankers are considered the world's critical infrastructure. The damage an accident in this industry can impose on the environment, people, and economies is tremendous, as we saw with the 2010 Deepwater Horizon disaster in the Gulf of Mexico. This catastrophe has put further emphasis on the culture of safety and security in the oil and gas industry. With the pervasiveness of digital data, the need for Holistic Security is growing. Physical and digital assets are abundant and need to be secured holistically, a requirement driven by the integration of information technology and operational technology (IT/OT) and maturation of Internet of Things (IoT) in the industry. Holistic Security is still a nascent As-a-Service Ideal today in energy operations offerings. The distributed nature of assets and the sheer number of contractors involved in day to day operations in oil and gas pose significant challenges for a holistic approach to security. This is not to say there is no physical security or cyber security in place, this industry has a high security threshold, but in HfS' view there is an opportunity for service providers to expand their culture and infrastructure of Holistic Security to create this holistic view of the state of physical and digital assets and up the ante on security in oil and gas and their role in securing energy.

Examples:

- Several service providers, such as Accenture, TCS, and Cognizant, operate managed security operations centers for clients. Wipro specifically has a strong vision for breaking down security silos in OT, IT and IoT. TCS also implements security for IT/OT integration scenarios, an increasingly critical aspect for managing assets. But, perhaps because of Atos' greater experience with military grade security services, HfS saw from Atos more of an strategy and awareness of what the opportunities and issues are for a holistic approach to cyber and physical security management than from other service providers. Understanding the needs of managing physical and data security in energy operations, Atos is showing how significant these capabilities will be and how it should increasingly form a integral part in a energy operations offering vision.

How As-a-Service Is Taking Shape in Energy Operations: Plug and Play Digital Business Services

Undertaking complex and often painful technology transitions to reach a steady state

➡️

Plugging into "ready to go" business outcome-focused, people, process, and technology with security measures

8 Plug & Play Digital Services

- Oil and gas is heavily dependent on ERP systems; Plug-and-Play can unlock value by interfacing with these systems and making them more extensible and valuable. Plug-and-Play also is well positioned for smaller but growing companies, and in support of replacing systems for companies going through mergers. Service providers in energy operations are just beginning to become partners with their clients in developing and deploying Plug-and-Play Digital Business Services. In oil and gas, a conservative industry, innovations have been adopted slowly, creating a sort of "innovation gap". Service providers now have the opportunity to leapfrog a generation of technology and services and really drive new Plug-and-Play Digital Services. At this moment, there are few true Plug-and-Play Digital Services. We see these services as being at the "Initial" stage of development with significant progress forecasted over the next few years as service providers become more comfortable with being platform developers.

Example:

- Accenture offers several services that can be procured with an As-a-Service model; one example is real-time digital turnaround analytics to drive significant cost and schedule performance improvements. It even has a service for a large multi-national resource company called "Everything As-a-Service", leveraging cloud-enabled data analytics, Internet of Things technology, and security and freeing up talented resources for innovative projects. This engagement is contracted with flexible consumption-based pricing to allow quick reaction to changes in the business environment.
- Infosys has a number of Plug-and-Play Analytics As-a-Service: clients can plug into competitor analytics (for instance distribution of wells and operators across leases and production vs. operators distribution) and completion efficiency and optimization (for instance frac stages and details vs production distribution or fracking wells by operators by year).

Contract Data Analysis

Large Oil and Gas Companies (>$20B) Dominate the Energy Operations Market; Mid-Market Growing Consumer of Services

Client Organizations' Revenue as % of Deals
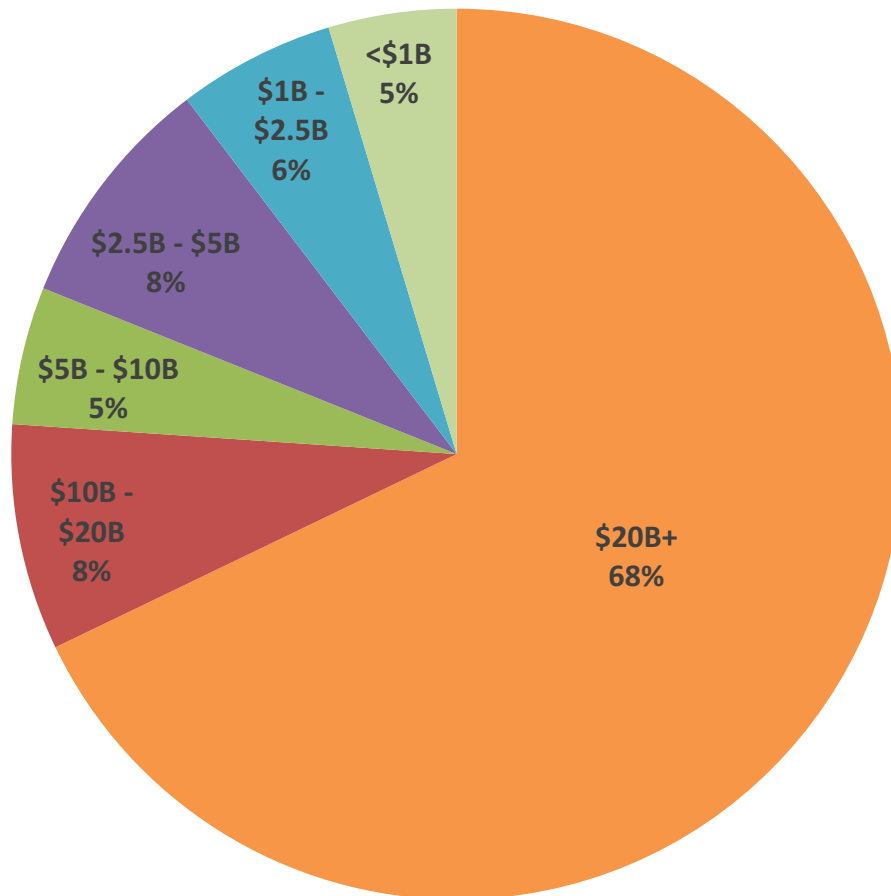
- Large oil and gas companies, with revenues above US $20 billion (68%), leverage outsourcing to speed up the transformation process

- Outsourcing activity among mid-market to small (<US$ 1 Billion to US$ 5 Billion) oil and gas operators now comprises one fifth of the market

North America Dominates the Energy Operations Market, Activity in Asia Pacific Is Increasing

Percentage of Contracts Signed by Region – 2005 to 2017
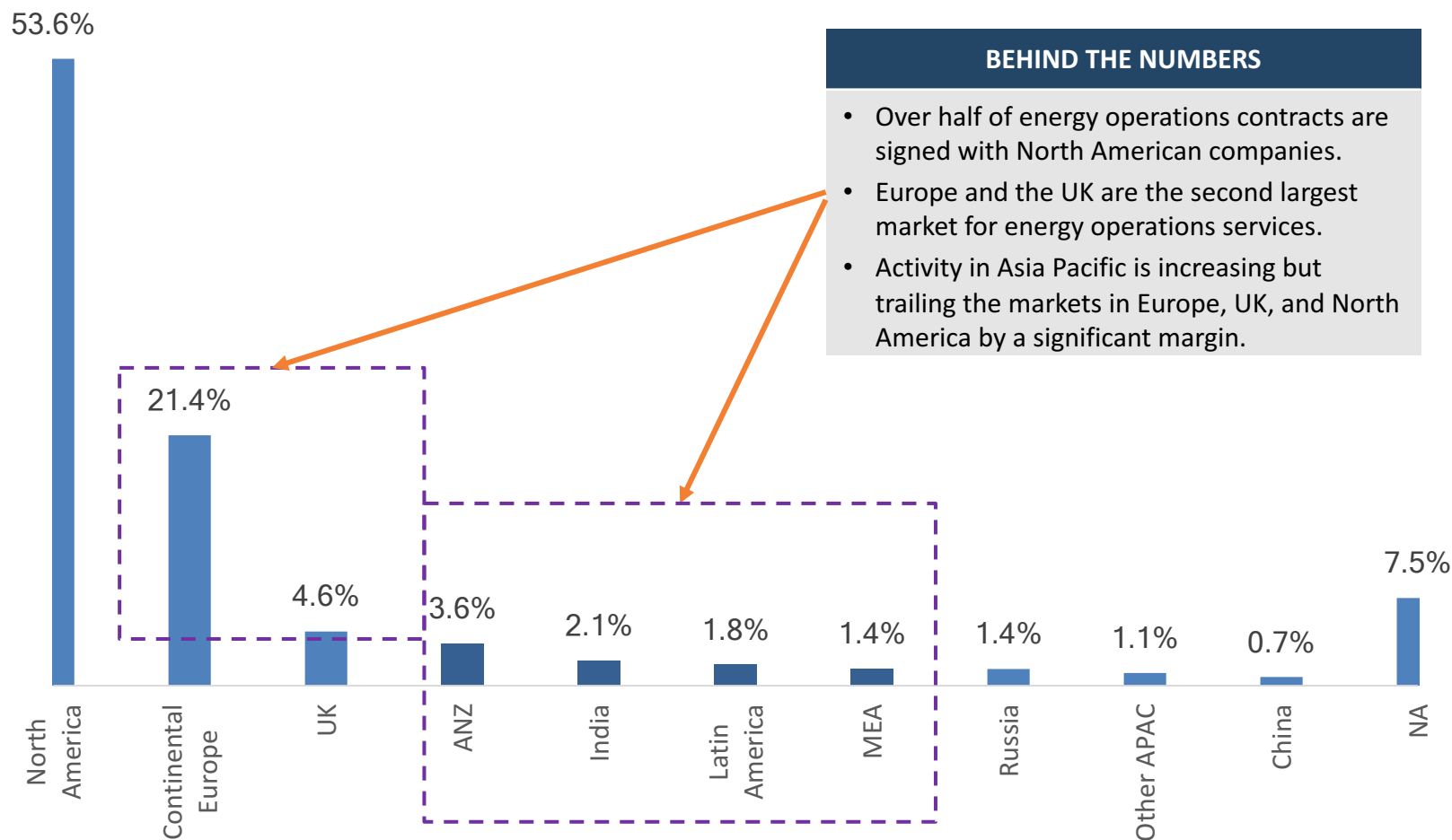
Chart values by region:

- North America: 53.6%
- Continental Europe: 21.4%
- UK: 4.6%
- ANZ: 3.6%
- India: 2.1%
- Latin America: 1.8%
- MEA: 1.4%
- Russia: 1.4%
- Other APAC: 1.1%
- China: 0.7%
- NA: 7.5%

BEHIND THE NUMBERS

- Over half of energy operations contracts are signed with North American companies.
- Europe and the UK are the second largest market for energy operations services.
- Activity in Asia Pacific is increasing but trailing the markets in Europe, UK, and North America by a significant margin.

Majority of Energy Operations Deals Have Duration Of Under Five Years

Length of Contract Term – 2005 to 2017
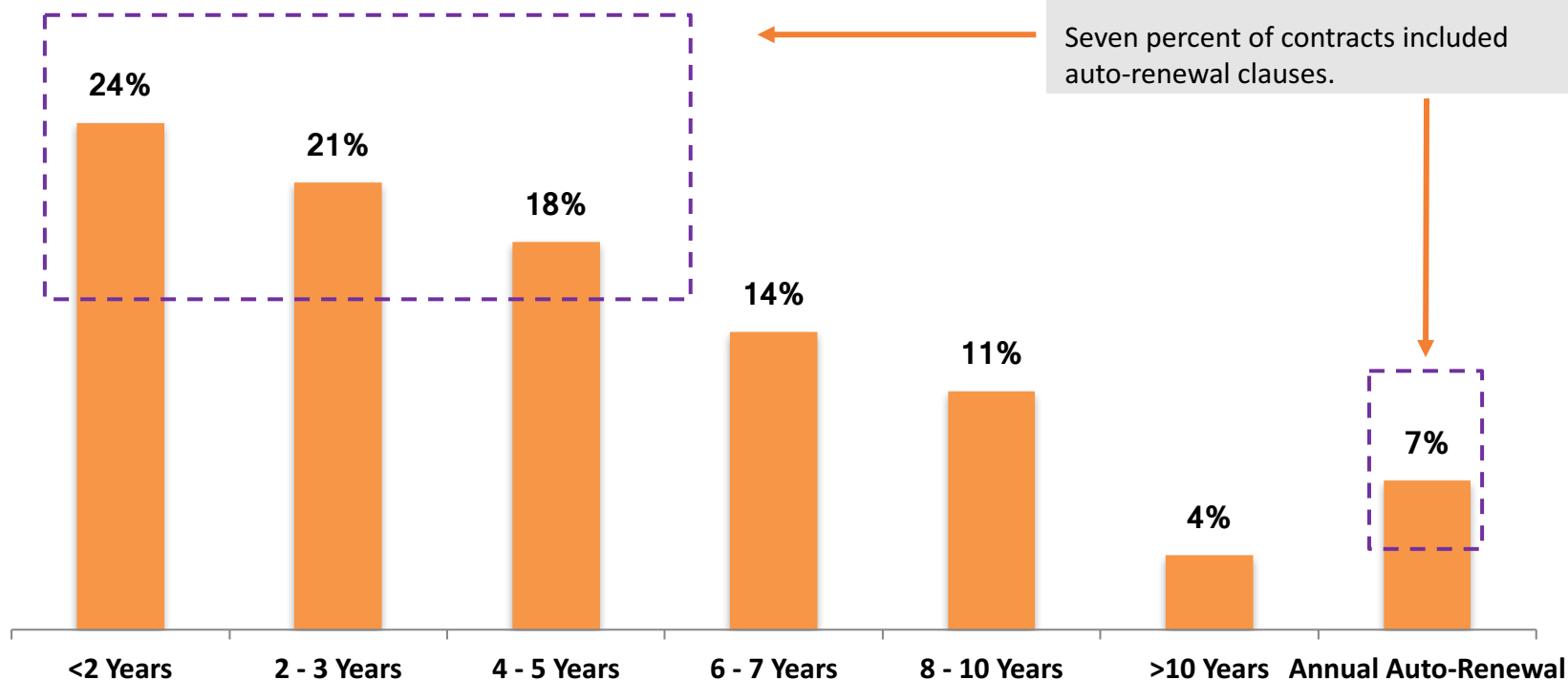
Behind the Numbers

Two thirds of contracts are under 5 years. Almost a quarter of contracts is under two years, signaling a trend of shorter commitments by energy operations clients.

Seven percent of contracts included auto-renewal clauses.

<2 Years	2 - 3 Years	4 - 5 Years	6 - 7 Years	8 - 10 Years	>10 Years	Annual Auto-Renewal
24%	21%	18%	14%	11%	4%	7%

Pricing Models in Energy Operations

Percentage of Energy Contracts by Pricing Construct
2015-2017 Contracts

Pie chart — Percentage of Energy Contracts by Pricing Construct:
- FTE or fixed fee 29%
- T&M (time and material) 24%
- Hybrid 21%
- Transactional 11%
- Subscription based 8%
- Gain-sharing or outcome based 7%
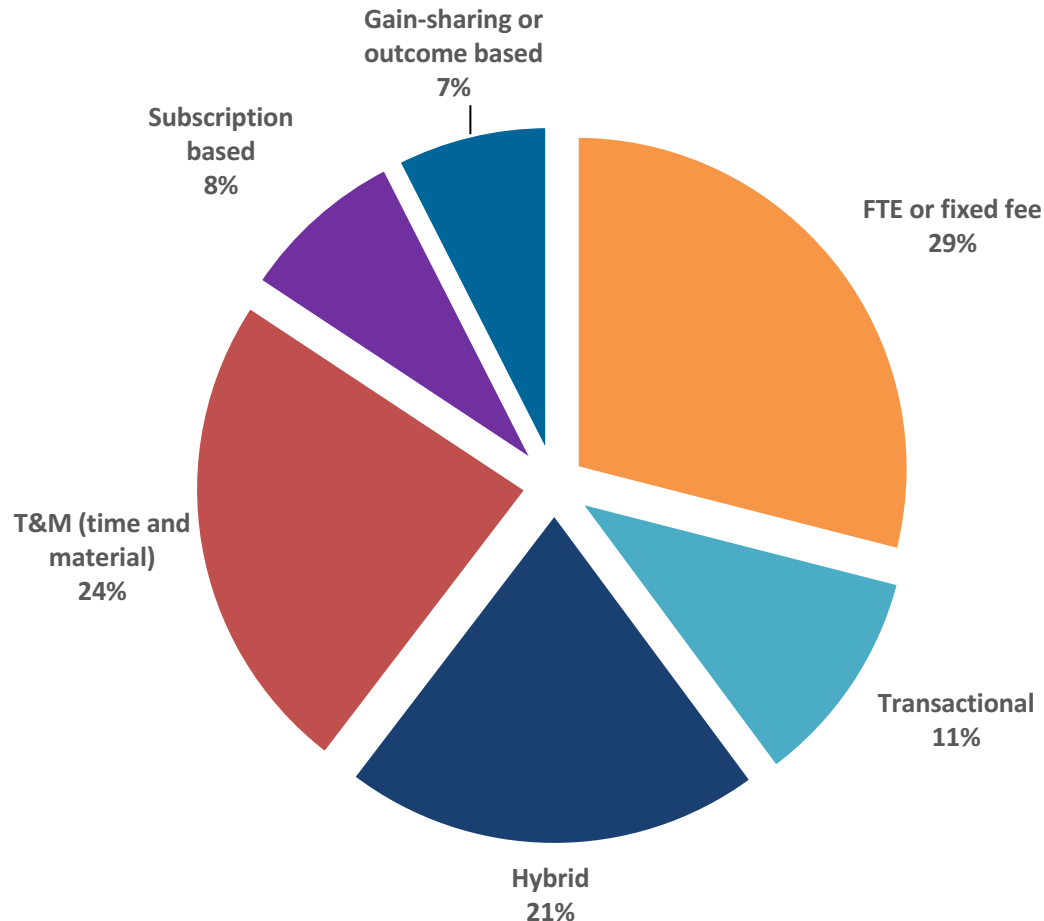
Behind the Numbers

- The pricing in energy operations contracts continues as predominantly FTE-based and time and material (T&M).
- However, buyers and service providers are increasingly exploring models beyond FTE-based pricing, signaling a desire to find more flexibility and pay on consumption basis.
- Most of the transaction-based pricing models have defined outcomes, however pricing is not yet tied to the business outcomes.
- Subscription-based pricing is on the rise in energy operations engagements, favoring on-demand, pay-as-you-go models and the ability to quickly ramp up and down if market volatility dictates.

Market Forecast Through 2021

Energy Operations Services Market Forecast Shows Low Growth With 1.7% Compound Annual Growth and Opportunity in Select Areas

2015–2021 Energy Operations Services Market Forecast ($M)

	2015	2016	2017	2018	2019	2020	2021	CAGR
ADM	510	535	561	589	623	661	702	5.6%
CRM	532	541	550	559	568	576	584	1.6%
F&A	1,056	1,073	1,091	1,116	1,135	1,153	1,172	1.8%
HR	409	422	434	448	463	479	495	3.3%
Industry Specific	1,662	1,639	1,608	1,571	1,528	1,478	1,421	-2.8%
IT Infrastructure Management	1,008	987	965	942	918	894	869	-2.5%
Other IT Services	933	929	926	924	918	915	911	-0.4%
Professional Services	2,533	2,647	2,767	2,894	3,031	3,196	3,367	4.9%
Total	8,645	8,772	8,903	9,043	9,184	9,352	9,522	1.7%

Research Methodology

Blueprint Research Methodology

Data Summary

- Data was collected in Q2 and Q3 2017, covering buyers, providers, and advisors/influencers of energy operations services.

Participating Service Providers

accenture

Infosys®

wipro

<epam>

TATA CONSULTANCY SERVICES

Cognizant

Atos

IBM

NTT DaTa

HCL

LTI

<LUXOFT

Tech Mahindra

This Report Is Based On:

- **Tales from the Trenches:** Interviews were conducted with buyers who have evaluated service providers and experienced the services. Some were supplied by service providers, but many interviews were conducted by HfS Executive Council members and participants in our extensive market research.

- **Sell-Side Executive Briefings:** Structured discussions with service providers were intended to collect data necessary to evaluate innovation, execution and market share, and deal counts.

- **Publicly Available Information:** Financial data, website information, presentations given by senior executives and other marketing collateral were evaluated.

HfS BLUEPRINT REPORTS

HfS Blueprint Scoring Percentage Breakdown

Execution	100%
Quality of service provider's account management team	10%
Integration of customer feedback and collaborative models of engagement	10%
Experience delivering to super majors (e.g., BP, Shell, Chevron, ExxonMobil, Eni, Total, ConocoPhillips) and national oil companies (e.g., Saudi Aramco, Nigerian National Petroleum Corporation, Qatar Petroleum)	15%
Talent development and ability to attract and retain key industry skills	10%
Actual delivery of services (upstream, midstream, downstream, cross industry)	20%
Depth of industry-specific capabilities (services, domain expertise, tools, platforms)	15%
Flexibility to deliver end-to-end and point solutions and integration of supporting technology	5%
Integration of partner services in delivery	7.5%
How is the service provider becoming a Broker of Capability for the client?	7.5%

Innovation	100%
Vision for oil and gas market evolution and services	15%
Models for co-innovation and collaboration for solution design	15%
Innovation in commercial models to help clients Write Off Legacy	15%
Use of partnerships, alliances, and joint ventures	15%
Strategy for the deployment of intelligent automation (RPA, autonomic platforms, cognitive computing)	10%
Investment in oil and gas market services related Plug-and-Play Digital Services	10%
Vision for Holistic Security of critical infrastructure	10%
Programs for developing industry talent	10%

Execution Definitions

Execution	How well does the service provider execute on its contractual agreement and how well does the provider manage the client/provider relationship?
Quality of service provider's account management team	How engaged is the executive and management team in defining and managing the delivery of services?
Integration of customer feedback and collaborative models of engagement	How has the service provider taken feedback and incorporated it into the solution and delivery? How was the service provider maintained a collaborative engagement?
Experience delivering to super majors and national oil companies	What experience does the service provider have working with the super majors (e.g., BP, Shell, Chevron, ExxonMobil, Eni, Total, ConocoPhillips) or national oil companies (e.g., Saudi Aramco, Nigerian National Petroleum Corporation, Qatar Petroleum)? How long have these engagements been active? What type of work is delivered, industry-specific services or horizontal services?
Actual delivery of services (upstream, midstream, downstream, cross industry)	What are the clients' and market's overall impression of the quality of service across the value chain from this service provider?
Integration of partner services in delivery	What role do partner services have in the value propositions and services delivered to clients? Are partner solutions an integral part of the providers' services? What are the clients' impressions of the integration of partner solutions into the delivery of services?
Flexibility to deliver end-to-end and point solutions	When looking at a client's energy operations issues, can the service provider offer various solutions (point and end to end) to create a flexible and configurable (or customized) response?
Becoming Brokers of Capability for clients	Is the service provider able to act as a deep partner in meeting clients' specific and varied talent and technology requirements over time?
Experience in delivering industry-specific solutions	How deep is the domain expertise (talent and solutions) in understanding and then addressing industry-specific issues? Is this domain expertise limited to a single industry area, or is it widespread? Is the service provider organized around industry-specific knowledge development and delivery?
Talent development and ability to attract and retain key industry skills	Does the service provider employ talent with oil and gas industry-specific skills and experience? What is the service provider's vision and strategy to attract and retain industry talent?

Innovation Definitions

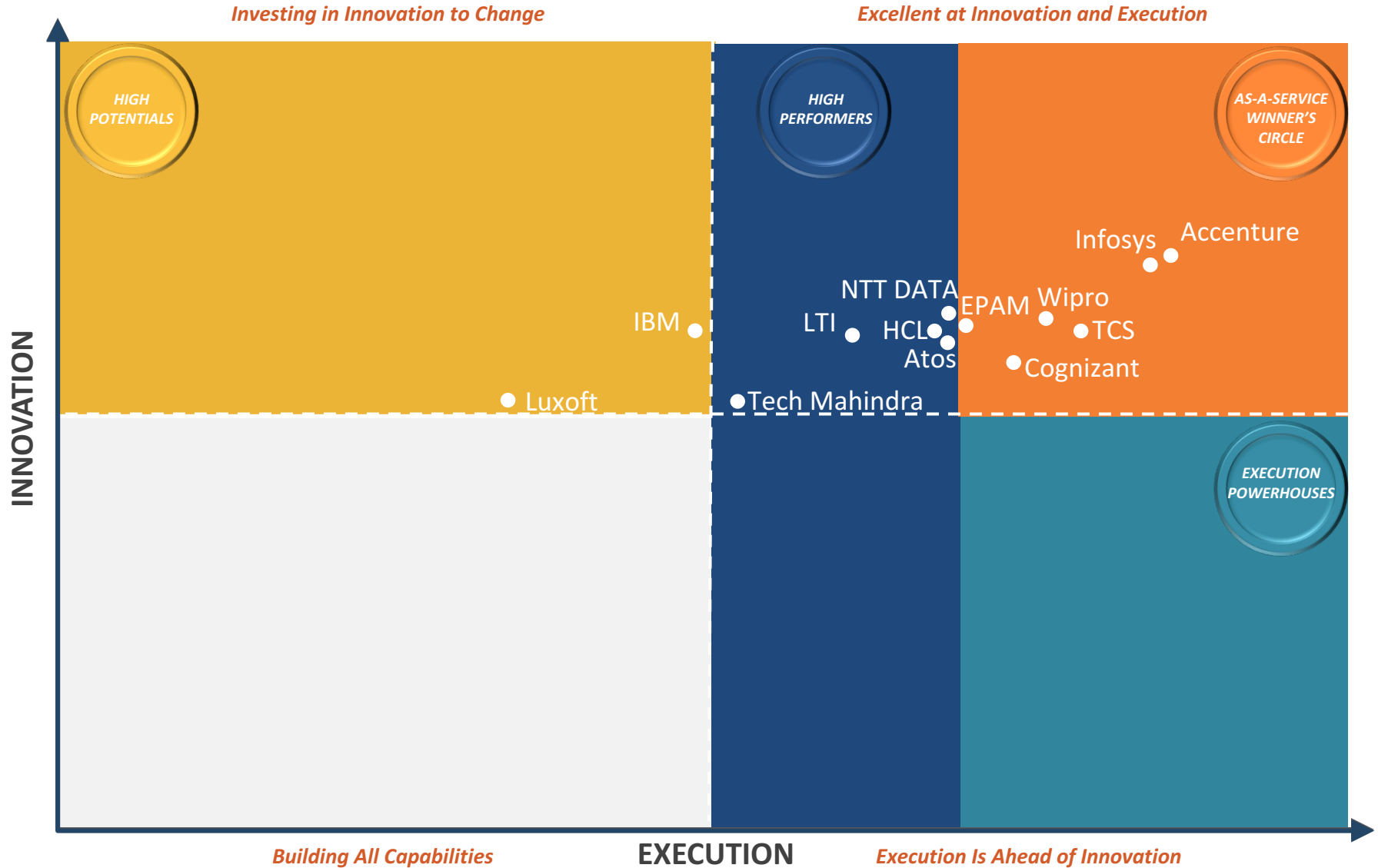| Innovation	How well does the service provider innovate its offering(s) in response to market demand, client requirements, and its own vision for how the oil and gas market will evolve?
Vision for oil and gas market evolution and services	What is the service provider's vision for the evolution of the oil and gas market and energy operations services? Is there a clear strategy for delivering energy operations As-a-Service, and are there identifiable investments in place to realize this strategy today?
Models for co-innovation and collaboration for solution design	What are the main areas of innovation customers are asking from service providers? What models are service providers experimenting with?
Vision for Holistic Security of critical infrastructure	How do service providers deal with security of the physical and digital environment? How is Holistic Security part of service delivery and platforms? Is Holistic Security integral to the service provider's offering?
Use of partnerships, alliances, and joint ventures	What partnerships, alliances, and joint ventures does the service provider have with providers of technology, tools, platforms, and domain expertise in oil and gas? How does the service provider use partnerships, alliances, and joint ventures to build and expand capabilities for service delivery?
Strategy for the deployment of intelligent automation (RPA, autonomic platforms, cognitive computing)	What is the service provider's approach to using intelligent automation platforms (RPA, autonomics, and cognitive) to improve the efficiency and effectiveness of delivering energy operations process? How mature is the service provider's strategy for intelligent automation?
Investment in oil and gas market services related Plug-and-Play digital services	What digital platforms does the service provider use to deliver energy operations services? Are they integral to the service provider's offering(s) or add-ons? How pervasive is the uptake of these digital platforms by clients today? What is the service provider's future digital platform strategy?
Innovation in commercial models to help clients Write Off Legacy	How does the service provider use and introduce new commercial models to give clients new ways of working with the service provider? How are new commercial models used to help clients Write Off Legacy, provide flexibility, or encounter less capital requirements up front?
Programs for developing industry talent	What does the service provider do to attract and develop industry talent? Are there identifiable investments made to develop industry talent, expand domain expertise in the oil and gas practice?

Service Provider Grid

Guide to the Blueprint Grid

To distinguish service providers that show competitive differentiation in a particular line of delivery with progress in realizing the "As-a-Service Economy" of business outcome-oriented, on-demand talent and technology services, HfS awards these providers the "As-a-Service Winner's Circle" designation.

	Execution	Innovation
As-a-Service Winner's Circle show excellence recognized by clients in the Eight Ideals in execution and innovation	Collaborative relationships with clients, services executed with a combination of talent and technology as appropriate, and flexible arrangements.	Articulate vision and a "new way of thinking," have recognizable investments in future capabilities and strong client feedback and are driving new insights and models.
High Performers demonstrate strong capabilities yet lack an innovative vision or momentum in executing the vision	Execute some of the following areas with excellence: worthwhile relationships with clients, services executed with "green lights" and flexibility when meeting clients' needs.	Typically, describe a vision and plans to invest in future capabilities and partnerships for As-a-Service, and illustrate an ability to leverage digital technologies and/or develop new insights with clients.
High Potentials demonstrate vision and strategy but have yet to gain momentum in executing them	Early results and proof points from examples in new service areas or innovative service models, yet lack scale, broad impact and momentum in the capability under review.	Well-plotted strategy and thought leadership, showcased use of newer technologies and/or roadmap and talent development plans.
Execution Powerhouses demonstrate solid, reliable execution, but have yet to show significant innovation or vision	Evidence of operational excellence; however, still more of a directive engagement between service provider and its clients.	Less evident vision and investment in future-oriented capability, such as skills development, "intelligent operations" or digital technologies.

HfS Blueprint Grid: Energy Operations

Investing in Innovation to Change   *Excellent at Innovation and Execution*

INNOVATION

HIGH POTENTIALS

HIGH PERFORMERS

AS-A-SERVICE WINNER'S CIRCLE

EXECUTION POWERHOUSES

Accenture

Infosys

NTT DATA

EPAM   Wipro

LTI   HCL   TCS

Atos   Cognizant

IBM

Luxoft   Tech Mahindra

Building All Capabilities   **EXECUTION**   *Execution Is Ahead of Innovation*

Major Service Provider Dynamics: Highlights

EXECUTION	INNOVATION

EXECUTION

- **Integration of Partner Services:** Partnerships are gaining in importance as the complexity of industry challenges can't be addressed by a single service provider, equipment manufacturer, technology vendor or oil field services company. **Accenture**, **Infosys**, **Wipro** and **TCS** have formidable partnerships across this spectrum and nurture mutually reinforcing relationships that produce joint go-to-market strategies, co-innovation and and strengthen the oil and gas practices and solutions of provider and partner.

- **Brokers of Capability:** Enterprise clients are becoming much more demanding in the type of roles and skills they want to acquire from service providers in Energy Operations processes. The days of large transactional team sourcing are over and being replaced by agile skill sourcing. Service providers, including **Accenture**, **Wipro**, **Infosys** and **TCS**, are adapting to this new dynamic by diversifying their skills offering, including technology and expertise from their partner ecosystem, and building more flexible commercial structures to provide access to talent to leading clients.

- **Talent:** The ability to attract, retain and develop domain talent is a key ingredient for a real oil and gas practice. The providers showcase excellent programs for Energy Operations Talent Development and we see very serious efforts to meet future demand for talent in the industry.

- **Industry-Specific Capabilities and Expertise:** The value of deep industry domain expertise in Energy Operations is resonating through interviews with clients and market shapers. **Infosys**, **TCS**, **Wipro, NTT DATA**, and **Accenture** lead the way here. **Cognizant**, **LTI**, **Tech Mahindra**, **EPAM**, **Luxoft**, **Atos** and others are stepping up industry investments, and **HCL** focuses on client needs for transforming the IT landscape.

- **Actual Delivery of Services:** The quality of service delivery is a crucial component of the value service providers offer their clients. This Blueprint places a lot of value on excellent service delivery. Highlights in feedback are provider have introduced more flexibility in service delivery and contractual arrangements and they combine industry expertise, consultative capabilities, technology leadership and consistent delivery.

INNOVATION

- **Partner Ecosystems and Alliances:** Service providers have a clear understanding that partnering is the key to being brokers of capabilities, bringing new value to engagements and being drivers of innovation. This translates into investments in industry specific and technology partnerships by almost all service providers in this Blueprint. The breadth of partner ecosystems and alliances of **Accenture**, **TCS**, **Wipro, HCL** and **Infosys** stand out, spanning alliances for the creation of industry specific solutions, academics and industry associations.

- **Vision for Energy Operations Market Evolution and Services:** In the challenging market environment, creating a strong vision for the oil and gas market, how client needs are evolving and the services needed to facilitate meeting these needs is more important than ever. Clients expect much more than just cost savings by labor arbitrage. Multiple providers stand out with their vision for the role of service providers will play in helping oil and gas clients in the energy transition, especially the providers in the **As-a-Service Winners Circle** and **HCL**, **NTT DATA** and **Atos**.

- **Expanding Use of Intelligent Automation in Energy Operations:** Artificial Intelligence and cognitive are still relatively new in Energy Operations processes, but HfS has seen encouraging use cases and commitment to Intelligent Automation from service providers. We expect Intelligent Automation capabilities to become much more mainstream in the next few years. Efforts from **IBM**, **Infosys**, **TCS** and **Wipro** in autonomics, Artificial Intelligence and cognitive stood out for this Blueprint, as well as **Accenture's** large scale application of automation in BPS service delivery, driving substantial value for clients. Service providers leading the integration of RPA in engagements are **Accenture**, **Infosys**, **NTT DATA**, **HCL** and **LTI**.

The Energy Operations Value Chain

Upstream		Midstream	Downstream		BPO	Engineering	IT
Asset management	Upstream accounting	Linear asset management	Emission management	Energy marketing	Analytics	Product lifecycle management	Application development & maintenance
Asset integrity management	Petro technical computing	Transportation operations management	Integrated refinery information systems	Retail and franchise operations	Digital transformation	Product design and engineering	IT security management
Digital oilfield management	Reservoir engineering	Supply and trading	Plant operations	Energy trading and risk management	Finance and accounting	MRO	Enterprise content management
Drilling and well completion management	Field development planning and contract management		Refinery production planning	Retail fuel pricing	Procurement		Environmental and health and safety systems
Upstream engineering and R&D			Supply planning and sourcing	Convenience retailing	HR and learning		IT operations
Upstream data management			Terminal operations		Knowledge management		SAP/Oracle ERP implementation and management
Production optimization			Distribution management		Sales and fulfillment		Mobility and IoT

Mature — Competitive market with examples of service offerings and customer case studies from a large number of service providers

Nascent — Market in development with limited examples of service offerings and customer case studies

The Current Maturity of Service Provider Energy Operations Offerings

- **Service Maturity Analysis:** The analysis of energy operations' scope and maturity by service is based on the full set of weighting criteria for operations, including time in the market, capability, vision and strategy, use of technology to deliver, client feedback, and proven results. The boxes represent the value chain.

	Upstream	Midstream	Downstream	BPO	Engineering	IT
Accenture	More mature	More mature	More mature	More mature	Less mature	More mature
Atos	More mature	More mature	More mature	More mature	More mature	More mature
Cognizant	More mature	More mature	More mature	More mature	Less mature	More mature
EPAM	More mature	More mature	More mature	More mature	More mature	More mature
LTI	More mature	More mature	More mature	More mature	More mature	More mature
HCL	Less mature	Less mature	Less mature	More mature	More mature	More mature
IBM	More mature	More mature	More mature	More mature	No services	More mature
Infosys	More mature	More mature	More mature	More mature	More mature	More mature
NTT DATA	More mature	More mature	More mature	More mature	More mature	More mature
Luxoft	Less mature	Less mature	No services	No services	Less mature	Less mature
TCS	More mature	More mature	More mature	More mature	More mature	More mature
Tech Mahindra	More mature	More mature	More mature	More mature	More mature	More mature
Wipro	More mature	More mature	More mature	More mature	More mature	More mature

Key to services maturity on the service provider profile pages

- No services offered
- Less mature services
- More mature services

Service Provider Profiles

NTT DATA

High Performer

Global provider adding energy operations capabilities through Dell Services acquisition and a strong vision for digital transformation and IT/OT integration in oil and gas

NTT DATA

Blueprint Leading Highlights	Strengths	Challenges
• Vision for oil and gas market evolution and services • Depth of industry-specific capabilities • Models for co-innovation and collaboration • Actual delivery of services	• **Dell Services acquisition:** The 2016 acquisition of Dell Services has propelled NTT DATA in the energy operations space, with an established client base and addition of capabilities in digital, cloud, industry-specific consulting, industry-specific platforms, RPA and infrastructure services. • **Research and Development**: NTT DATA can tap into NTT Group's large R&D organization and research and its investment arm, I3, which has a $2 billion per year R&D budget and allows investments in areas relevant to oil and gas such as autonomous drones, machine learning, and wearables using smart fabric. • **Broker of Capabilities**: NTT's strategy involves becoming a cross partner and cross platform integrator for clients and is open to co-innovation, co-investment, and collaboration with clients, for example in joint ventures. Particularly important in industries like oil and gas, where partnerships and the integration of partner services in service delivery is continuing to be more prevalent for future value creation. • **IT/OT integration vision and capabilities:** NTT's background in data services, IT, and communications and NTT DATA's partnerships with OEMs like GE, Honeywell, Cisco, IBM, and Dell. NTT DATA has shown ability to deliver innovative commercial models for large and long IT/OT integration engagements, changing IT/OT offerings from a CAPEX based to a consumption led OPEX model to enable clients to free-up cash flow for core investments.	• **Integration of Dell Services:** The melding of the Dell Services energy practice in the US and the Everis practice in EMEA has created a capable and accomplished global Energy Operations practice for NTT DATA. Integrating NTT capabilities and global power together with Dell Services capabilities is the next step for the new Oil & Gas practice and creation of innovative, new Energy Operations services. • **Build out brand recognition in oil and gas industry**: In the oil and gas industry, NTT DATA is traditionally not a big name. Acquisition of Dell Services makes NTT a player in energy operations and the challenge is to build out name recognition along with capabilities. • **Expand industry-specific partnerships**: Continuing to build out the partner ecosystem, particularly with oil and gas industry players. This fits well with the broker of capability mindset NTT DATA showcases and the direction of the energy operations market.

Value Chain Services Maturity

Upstream
Midstream
Downstream
Cross Value Chain BPO and Engineering
Cross Value Chain ITO

Relevant Acquisitions / Partnerships	Key Clients	Global Operations	Proprietary Technologies / Platforms
Acquisitions: 2016: Dell Services, Nefos; 2015: Carlisle & Gallagher; 2014: Everis; 2010: itelligence. **Partnerships**: Legacy IT partnerships such as SAP, Microsoft, and Oracle Cloud-based business providers such as SAP HANA, MS Azure, Salesforce, AWS, BMC and Google OEM Technology vender such as Dell, Cisco, IBM, HP, GE and Honeywell RPA solutions provider such as Pega Robotics, Blue Prism, Automation Anywhere, and IPsoft	100 clients globally including • Integrated super major • Natural gas distribution company • An integrated global energy company • A Spanish multinational oil and gas company • The largest and primary petroleum company in LA • A global oil exploration and production company • An American multinational energy corporation • One of the United States' largest natural-gas-only distributors • A global leader in oil and gas projects, technologies, systems, and services • A petroleum and natural gas exploration company	**Headcount:** 5000 FTEs across 40 Global Operations Centers supporting 50 countries • North America - 20% • LATAM - 20% • EMEA - 20% • India - 30% • Other APAC - 10%	• *Hitoe:* Smart fabric for worker safety • *AW3DTM:* Precise global 3D map covering all global land spaces • *Liquitrax:* IoT solution for land based movement of high value liquid hydrocarbons • *Automated Full-Time Equivalent (AFTE):* Extension of robotic process automation (RPA), where automated script/process tools eliminate the need to hire staff for repetitive tasks • *Jubatus:* Scalable distributed processing framework for real-time analysis of Big Data • *DynAMO:* Dynamic Application Management and Outsourcing solution • *Xrosscloud:* M2M solution made up of a cloud platform, applications, and consulting services • *Global Threat Intelligence Platform (GTIP):* Proactive and global resilient cyber defense

Market Wrap-Up and Recommendations

Where to Next for Energy Operations?

We see the following as the major trends that will foster the future evolution of Energy Operations over the next two to three years:

- As renewable energy and storage technology is gaining traction and prices are falling rapidly, combined with countries (France, UK, India) announcing bans on cars with internal combustion engines by 2040, the race to remain relevant is heating up for oil and gas companies. Expect big investments in renewable energy, storage and infrastructure for electric vehicles.

- Digital transformation is top of mind for every oil and gas executive and particularly scaling beyond the smaller projects and proof of concepts we see now is the main concern. Service providers need to offer end-to-end digital transformation services that have the ability to scale and guarantee speed to value.

- Quick ramp up of the digital oilfield and IT/OT integration. The digital footprint will increase in energy operations. In upstream, advanced analytics will improve operations in drilling, reservoir modeling and engineering, and remote monitoring.

- Mobility combined with other digital technologies like social, virtual reality and augmented reality will further enable digital field workers. Digitally enabled workers can collaborate with experts, interact with their environment via video streaming and access contextualized knowledge in the field.

- Intelligent automation, led by robotic process automation (RPA) in BPO and autonomics in IT will become deeply integrated service delivery, reducing the size of current labor arbitrage–centric contracts further. Cognitive computing will take center stage in many new services across the value chain.

Where to Next for Energy Operations?

We see the following as the major trends that will foster the future evolution of Energy Operations over the next 2–3 years:

- Uptake of Energy Operations services in small and medium oil and gas companies will grow and service providers are in a position to deliver more modular, on-demand, As-a-Service services to these operators, taking away capital expenditure burdens and allow for more (co-) innovation and investment.

- Demand and take-up for digital services that directly contribute to improved operational efficiency and agility will grow significantly.

- Increasing efforts to write off legacy and usage of new digital platform capabilities facilitates more integration of core industry platforms with digital (industry) solutions.

- In Marketing and Retail, oil and gas companies will seek to improve customer experience and loyalty with innovation in loyalty programs and services tailored around the individual customer. Digital platform-enabled omni-channel marketing and seamless payment models together with advanced analytics, behavioral models and personalization are key aspects.

- Blockchain enters the energy arena and becomes an integral part of the future of energy trading and wider energy operations. Investments in use cases of Blockchain like smart contracts, joint venture accounting and hydrocarbon accounting will soar. There are many hurdles to take, from regulatory to tax challenges, but Blockchain technology holds the promise to underpin a new era of energy supply and consumption.

Where to Next for Energy Operations?

We see the following as the major trends that will foster the future evolution of energy operations over the next two to three years:

- 3D, 4D and 5D visualizations and simulations will become more prevalent in designing solutions, MRO, HSE, training purposes and planning processes across energy operations.

- As the market adjusts to the new oil price reality expect transformation of the front-office and back-office to be high on the agenda of oil and gas companies as they look for new ways to achieve efficiency and effectiveness.

- Analytics offerings will evolve from being based largely on access to data science talent and unique algorithms. It will include industry-specific analytical applications delivered by service providers that deeply understand a client's enterprise and marketplace.

- Predictive and prescriptive analytics will enable more real-time decision making and this will have a huge impact on the operating models in the industry.

- Integration of asset data in cloud platforms enables a unified view of production assets and operations, leading to better planning and use of resources.

- The (Industrial) Internet of Things holds tremendous promise and we expect adoption to accelerate as there are already huge numbers of connected assets in the industry and connecting those assets to the internet will bring tremendous value.

Energy Operations Is Beginning to Incorporate the Ideals of the As-a-Service Economy

Ideal	As-a-Service Ideal Definition	Nonexistent	Initial	Expansive	Extensive	All Pervasive
Write Off Legacy	Using platform-based solutions, DevOps, and API ecosystems for more agile, less exception-oriented systems			2017	2020	
Design Thinking	Understanding the business context to reimagine processes aligned with meeting client needs			2017	2020	
Brokers of Capability	Orienting governance to source expertise from all available sources, both internally and externally, to address capability gaps			2017	2020	
Collaborative Engagement	Ensuring relationships are contracted to drive sustained expertise and defined outcomes			2017	2020	
Intelligent Automation	Using automation and cognitive computing to blend analytics, talent, and technology				2017	2020
Accessible and Actionable Data	Applying analytics technologies, processes, and resources on relevant data sets to derive insights that can help improve an enterprise				2017	2020
Holistic Security	Proactively managing digital data across service chain of people, systems, and processes		2017		2020	
Plug-and-Play Digital Business Services	Plugging into "ready to go" business outcome–focused, people, process, and technology solutions with security measures		2017		2020	

HfS BLUEPRINT REPORTS

2018-2019 Recommendations: Enterprise Buyers

■ **Look for Providers with Strong Partner Ecosystems:** Providers' partnerships with industry-specific companies, technology vendors and equipment manufacturers are a source of innovation and value for buyers and an indication of their ability to play an integral role in areas like IT/OT integration and broader business transformation.

■ **Truly Focus and Invest in Holistic Security:** The oil and gas industry harbors a lot of critical infrastructure. Securing this infrastructure is only getting more important as it is the target of cyber attacks and risks increase with the IT/OT integration and growth of networks of connected assets. Ask your service provider(s) for their vision and strategy for Holistic Security. The service provider's culture and infrastructure of security is critical for their ability to keep your operations secure.

■ **Adopt Design Thinking:** Don't dismiss design thinking as something that is a fad with little benefit for your own operations. The opportunities to sit down with your service provider(s) to better understand the business context in which your current processes operate and what can be done to realign or reimagine these processes to achieve different or better results is always an exercise worth undertaking.

■ **Insist on Collaboration to Achieve Your Strategy:** Push your service provider(s) to be more collaborative, more visionary, and more inclusive and to share with you. In turn, provide that same approach to the service provider(s). Discuss the business challenges you have like close partners and invite a proactive role from your service provider to come up with ideas to create the business outcomes you need.

■ **Truly Focus on Making Data Work for Your Organization:** Data and more specifically insights from your data will hugely impact your future ability to compete. Analytics, insights and better understanding enable superior decision making influencing economic viability of energy operations and competitive advantage. Select service providers based on their ability to provide you with deep expertise and capabilities in data and information management, advanced analytics, and ability to translate your data into actionable and accessible insights supporting your entire organization.

2018-2019 Recommendations: Enterprise Buyers

- **Move Faster and Deeper to As-a-Service Offerings from Service Providers:** As an enterprise buyer, keep pushing your service provider(s) to move to an As-a-Service model that goes beyond labor arbitrage to include and offer you a broader set of choices for what solutions you adopt and how they interact with your own retained organization. Don't settle for a long-term fixed model of solution delivery for energy operations services, but push your service provider(s) to be flexible and agile so that future services offerings better align to your own potential future needs. As part of the As-a-Service push, opt for Plug-and-Play Digital Services like BPaaS where you can, especially for standardized, commoditized services.

- **Take a Co-Investment and Partnership Approach to IoT:** IoT has the ability to underpin major transformations across the Energy Operations value chain. While IoT is a very important imperative for oil and gas, we don't see widespread or large-scale projects yet. No service provider has all the pieces of the puzzle that is Internet of Things. Look for service providers who can partner with you, act as Brokers of Capability, and have a good partnership strategy.

- **Articulate Innovation Ambitions:** Be clear about what you expect from your service provider(s) when it comes to innovation. Many buyers expect service providers to help them innovate. Put this innovation ambition at the center of the engagement and select providers based on their innovation merits in other industries and other energy operations clients.

- **Push the Automation Envelope:** Make it clear that you expect service providers to pull every lever available to achieve more cost savings and greater quality, accuracy, and speed in processes, and balance it with a joint strategy.

- **Dare to Make Cost Savings Work for Innovation:** It is very attractive to put cost savings achieved by service providers in the hand of the CFO in the current environment. We recommend to reinvest savings in innovation; make it a part of a collaborative engagement arrangement: service provider, save 20% and get that 20% as innovation budget.

2018-19 Recommendations: Service Providers

- **Build Partnerships with Technology Vendors and Original Equipment Manufacturers:** Partnerships are gaining in importance as the complexity of industry challenges can't be addressed by a single service provider, equipment manufacturer, technology vendor or oil field services company. Service providers build and should continue to invest in partnerships across this spectrum and nurture mutually reinforcing relationships that produce joint go-to-market strategies, co-innovation and and strengthen the oil and gas practices and solutions of provider and partner.

- **Be On The Leading Edge Of Blockchain:** Blockchain technology and smart contracts have the ability to play a significant role in energy trading and transactions, hydrocarbon accounting, asset management and joint venture accounting. Peer to peer trading is already a reality. Blockchain can be the connecting tissue for energy trading in a world of de-centralized, low hydrocarbon, distributed energy resources and large scale electricity storage, changing the dynamic of the energy market. Invest in experiments, expertise, use case development, proof of concepts, education and thought leadership around Blockchain, its impact on energy trading, Energy Operations processes and platforms and your Energy Operations capability stack.

- **Put Platforms At The Center Of Your Strategy:** Underpinning As-a-Service delivery are full-stack platforms that enable end-to-end services combining people, technology and processes. Invest in the development of proprietary platforms with embedded advanced analytics capabilities to position your practice to seize opportunities from digital technologies and the wave of data-enabled transformation in the industry.

- **Whatever You Do, Automate, Automate And Automate:** Oil and gas companies expect service providers to use automation in service delivery and be a major partner for their own automation efforts. Some of the clients we have spoken with see automation in services as table stakes. It is paramount for service providers to leverage automation for clients and take the maturity up a notch in the coming 12-24 months, from RPA and autonomics to Artificial Intelligence and cognitive computing to make sure you are not left out of the automation race.

2018-2019 Recommendations: Service Providers

- **Craft a Low Hydrocarbon, High Renewable Energy Future Story:** By now, oil and gas companies realize the world is moving to a low hydrocarbon future. This means for them to stay relevant, investments have to be made to play a role in tomorrow's energy ecosystem. Service providers need to have a strong story and accompanying service offerings around integration of renewable energy sources and building new business and operating models around renewables.

- **Co-Invest in Innovation:** Pro-actively and aggressively push the innovation agenda around DER integration, IT/OT convergence, automation, analytics, predictive maintenance, drones, 3D printing for MRO, simulating with digital twins, machine and deep learning, cognitive computing and Blockchain. And show your willingness to put your skin in the game.

- **Put Your Money Where Your Mouth Is:** Be prepared to back up your claims of being an innovation powerhouse with the willingness to co-invest in innovation. Pro-actively and aggressively push the innovation agenda around automation, analytics, , blockchain, drones, robotics and autonomous vehicles, 3D printing for MRO, simulating with digital twins, machine learning, and cognitive computing. Bring in ideas and innovations from other industries. Present clients with use cases, examples and capabilities to "unfreeze," inspire and build credibility in innovation.

- **Move Further to As-a-Service Offering Design and Execution:** At HfS, we are strong believers in the rapid move of BPO away from legacy "lift and shift" models toward an As-a-Service solution design and delivery world. We have seen significant progress from service providers in this Blueprint in their move to As-a-Service as well as rising demand for new engagement models from buyers. But there is still significant opportunity to move this further forward and bring a more modular yet end-to-end solution stack to energy operations and bring more integration, innovation, flexibility, and agility into the engagement.

- **Industry Talent Is Key:** Industry talent and capabilities form the heart of the leading Energy Operations practices in this Blueprint. Shore up the investment in attracting, developing, and retaining people with deep domain expertise and experience.

About the Author

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Overview

- Derk Erbé is Research Vice President, Supply Chain, Procurement and Energy. Erbé is responsible for a compelling, leading-edge research agenda covering the core topics of interest for buyer and vendor communities in the areas of digital business transformation services and business operations, with a specific emphasis on key vertical markets, namely Energy, Utilities and Resource Industries.

- He works with the HfS research team on key research areas that are impacting HfS clients, such as automation, SaaS and workforce transformation.

- Derk is responsible for Custom Research at HfS, working across the commercial and analyst team and client organizations developing and executing research deliverables.

- Derk has a keen interest in Business Transformations, new business models, Digital, Mobile and IoT from a technology and change management perspective.

Previous Experience

- Most recently, Derk was Co-Founder and CEO of Kea Company. He held several roles at Kea Company, serving as EVP Strategy and leading business advisory and consultancy. He was part of the team behind the annual global Analyst Relations Forum.

- Throughout his career Derk had a wide variety of leadership, consultancy and advisory roles with emphasis on business processes, operations, enterprise architecture, change management and crisis management. He was a management consultant and interim manager at energy companies like RWE/Essent and a natural gas giant, NGO's, government agencies, tech startups, large technology vendors and service providers.

- Derk is known for his ability to rapidly distill the top priorities in difficult circumstances and fluid, complex situations and executing on these priorities with his "getting things done" mentality.

Education

- Derk holds a Master's of Science in Sociology from the University of Amsterdam.

HfS: Revolutionizing the Industry

HfS' mission is to provide visionary insight into the major innovations impacting business operations: automation, artificial intelligence, blockchain, digital business models and smart analytics. We focus on the future of operations across key industries. We influence the strategies of enterprise customers to develop operational backbones to stay competitive and partner with capable services providers, technology suppliers, and third party advisors.

HfS is the changing face of the analyst industry combining knowledge with impact:

* ThinkTank model to collaborate with enterprise customers and other industry stakeholders
* 3000 enterprise customer interviews annually across the Global 2000
* A highly experienced analyst team
* Unrivalled industry summits
* Comprehensive data products on the future of operations and IT services across industries
* A growing readership of over one million annually

The "As-a-Service Economy" and "OneOffice™" are revolutionizing the industry.

Read more on HfS and our initiatives here.