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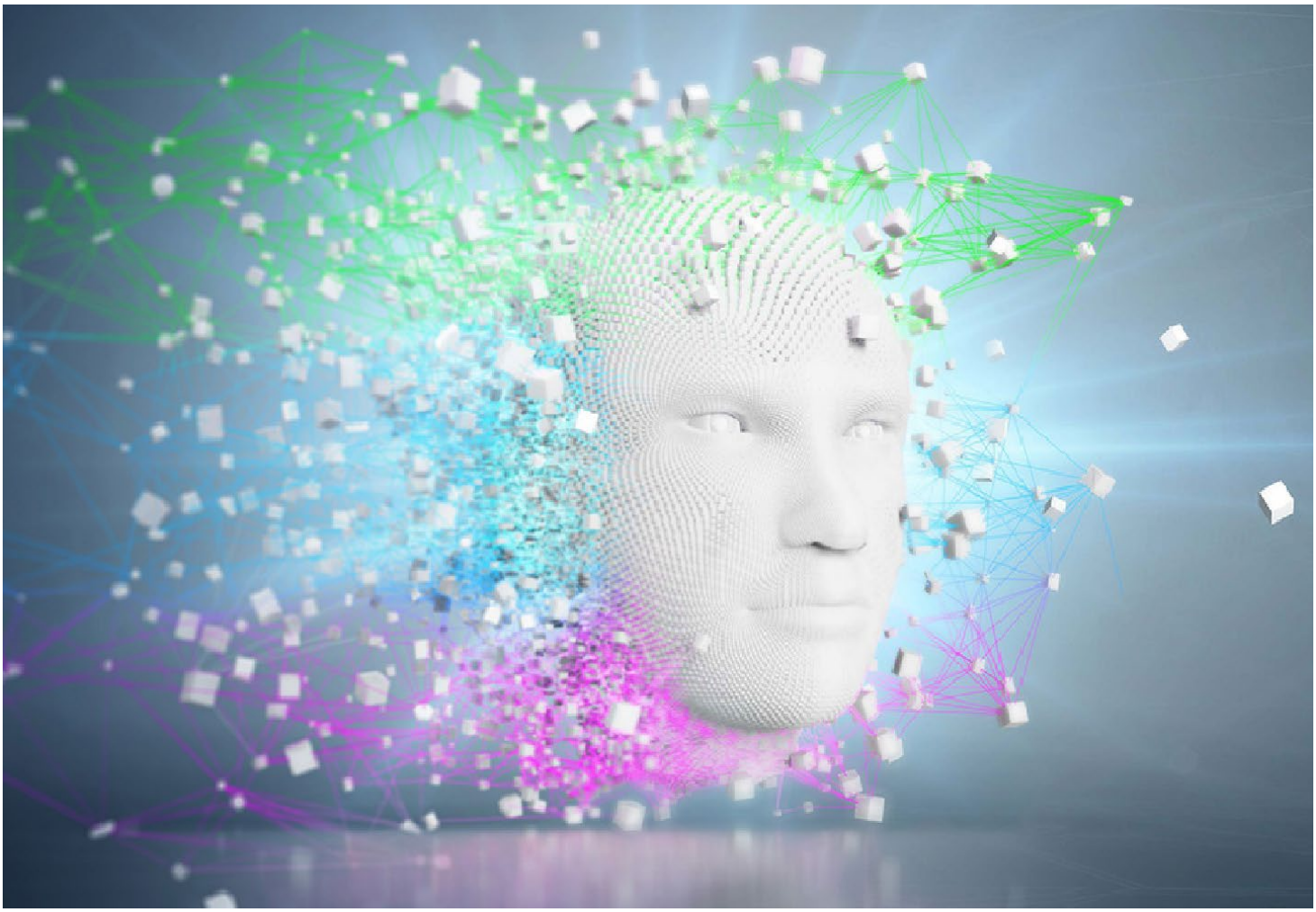


Tech Trends 2022 – Oil & Gas Industry

Oil & Gas companies are using Technology to continue the recovery from the Pandemic, while transforming themselves for the future

Technology is ever more powerful. Forward-thinking Oil and Gas companies are expending effort to better understand the technological forces that surround them and are seeking ways to harness them, not only for the benefit of their direct customers, stakeholders, employees, and suppliers, but also, for the eventual consumers of these products. Such leaders are focusing on the transformation of technology operating models, as well as the development and alignment of technology architectures and roadmaps, as a key planning and communication mechanism.

Relevance and readiness scale: We looked at each trend and assigned a value from one (low) and five (high) based on the trend's relevance and readiness of adoption within the Oil and Gas industry.

Relevance: How impactful would it be if Oil and Gas companies adopted the trend?

Readiness: How ready are Oil and Gas companies to adopt the trend?

This report provides an Oil and Gas-specific take on Deloitte's Tech Trends 2022 report, spotlighting the accelerating technology trends most likely to cause disruption over the next 18–24 months. We explore which trends may be most relevant for Oil and Gas companies and how ready they are to take advantage of them.

Learn how early trend participants are taking advantage of new opportunities in automation, blockchain, data-sharing, and other areas to transform their organizations and engineer competitive advantage.

Data-sharing made easy

A host of new technologies promise to simplify the mechanics of data-sharing across and between organizations while preserving the veil of privacy. As part of a growing trend, organizations are unlocking more value from their own sensitive data while leveraging enormous volumes of externally sourced data that has traditionally been off limits. This can open up a new arena of data-driven opportunities. Indeed, the ability to share secured data with others within an ecosystem or value chain is giving rise to new business models and products. For example, by pooling clinical data on shared platforms in the early days of the COVID-19 pandemic, researchers, medical authorities, and drug makers were able to accelerate the development of treatments and vaccines. Moreover, these same data-sharing protocols have helped drug makers, government agencies, hospitals, and pharmacies coordinate and execute expansive vaccination programs that prioritize efficiency and safety and preserve intellectual property.

Trends in action

Oil and Gas companies can unlock greater value by coordinating data management, business intelligence and analytics activities across Business Units and functions, and within functions themselves. Most companies have instituted several data programs to continue addressing this area and have realized the benefits of enhancing connectivity within BU's and functions. For instance, improved data curation and cleansing leads to improved downstream results for Machine Learning and analytics applications. By implementing solutions that enable broader data visibility and real-time data sharing for analysis and modeling, O&G companies can better gather data about demand, supply, inventory, financials, operations, cybersecurity, technology risks, and more. Some increased data sharing among O&G operators is also helping them scale faster. Sharing KPIs is incentivizing the industry to deliver operational metrics to match peer groups.

Readiness: ● ● ● ○ ○
Relevance: ● ● ● ● ●

Cloud goes vertical

The center of gravity around digital transformation has shifted from meeting the IT needs of an industry-agnostic organization to meeting the unique strategic and operational needs of each sector and even subsector. Hyperscalers and SaaS vendors are working with global system integrators and clients to provide modularized, vertical-specific business services and accelerators that can be easily adopted and built upon for unique differentiation. As this trend gains momentum, deploying applications will become a process of assembly rather than creation—a shift that could reorder the entire value stack. Business processes will become strategic commodities to be purchased, freeing organizations to focus precious development resources on critical areas of strategy and competitive differentiation.

Trends in action

Currently, most Oil and Gas companies are at early stages of their Cloud journeys, which are primarily focused on planning, POCs, Cloud migrations, limited Cloud transformations, and some use of Cloud managed services. As Cloud vendors offer more powerful APIs, services, and SaaS systems, organizations are increasingly able to configure and assemble platforms and horizontal systems together, in addition to migrating existing workflows to the Cloud.

While true industry clouds are not yet available for Oil and Gas, companies should evaluate legacy applications and portfolios against modern capabilities to identify Cloud opportunities to replace legacy features and functions. Particularly, in areas with high technology obsolesce risks or tech debt.

Readiness: ● ● ● ○ ○
Relevance: ● ● ● ● ●

Blockchain: Ready for business

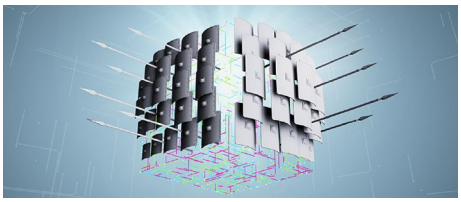
Trendy cryptocurrencies and nonfungible tokens (NFTs) capture media headlines and the public imagination, but these and other blockchain and distributed ledger technologies (DLTs) are also making waves in the enterprise. In fact, blockchain and DLT platforms have crossed the disillusionment trough of the hype cycle and are well on their way to driving real productivity. They are fundamentally changing the nature of doing business across organizational boundaries and helping companies reimagine how they make and manage identity, data, brand, provenance, professional certifications, copyrights, and other tangible and digital assets. Emerging technical advancements and regulatory standards, especially in nonpublic networks and platforms, are helping drive enterprise adoption beyond financial services organizations. As enterprises get comfortable with blockchain and DLT, creative use cases are cropping up in many industries, with established industry leaders expanding their portfolios and creating new value streams, while startups dream up exciting new business models.

Trends in action

While Blockchain use cases are not highly prevalent in the Oil and Gas industry today, it has the potential to play a key role in meeting regulatory requirements, resulting from the strong regulatory policies required in this industry. For instance, Blockchain's digital ledger can help improve the accuracy of Scope 3 (indirect, carbon emissions) reporting across the value chain.

Blockchain is also playing a role in eliminating needs for clearing houses, confirmation processing, and other back-office administrative tasks. Relevant use cases for Blockchain from other industries, include combining this technology with digital plant equipment, and delivery sensors, to better track output and invoice customers in real-time, enabling staff resources to focus on more value-added activities.

Readiness: ● ● ○ ○ ○
Relevance: ● ● ● ● ○



Cyber AI: Real defense

Security teams may soon be overwhelmed by the sheer volume, sophistication, and difficulty of detecting cyberattacks. Enterprise attack surfaces are expanding exponentially. The use of 5G is growing, along with the number of network-connected devices; remote work is gaining ground; and third- party attacks have become increasingly pernicious. It's time to call for AI backup.

Cyber AI can be a force multiplier that enables organizations not only to respond faster than their attackers can move but also to anticipate these moves and act in advance. AI can be expanded beyond established applications, such as using it to accelerate data analysis, identify anomalies, and detect threats. These emerging AI techniques can help human analysts focus on prevention, remediation, and developing a more proactive, resilient security posture. And as AI is adopted across the business, it can also be leveraged to help protect valuable AI resources and combat AI- powered attacks.

Trends in action

The rapid adoption of digital technologies and connected devices within the Oil and Gas industry is making their IT and OT landscapes more vulnerable.

Cyber AI driven tools can provide a first line of defense for endpoint devices, enabling the prevention / mitigation of attacks from known and unknown sources of risk. Furthermore, this frees up resources previously focused on securing individual OT systems with the behavioral analysis and continual monitoring Cyber-AI provides. As a result, CIOs of Oil and Gas companies should be placing upfront focus on cyber-AI enabled tools when defining their digital transformation strategies.

Readiness: ● ● ○ ○ ○
Relevance: ● ● ● ● ●

IT, disrupt thyself: Automating at scale

Faced with creeping technological complexity and higher expectations of stability and availability, some CIOs are radically reengineering their IT organizations. How? By taking a page from the cloud provider's playbook. They are identifying repetitive, manual processes and applying a combination of engineering, automation, and self-service. The net result is streamlined timelines, accelerated value delivery, and more effective and stable IT across the board. This kind of disruptive automation represents a vast yet underrealized opportunity. Previous technology trends such as NoOps, Zero trust, and DevSecOps, share a common theme—the importance of moving to code across the organization. Migrating away from manual administration to engineering and automation: organizations can manage complex systems more effectively and improve the customer experience through improved availability and resilience.

Trends in action

Many Oil and Gas companies are transforming technology operating models and are looking to significantly leverage IT automation tools and other systems (e.g., Cloud Tech, Modern ERP, etc.), in order to make operations more effective, error-free, and scalable, Also, given the war for IT talent, Oil and Gas companies cannot afford to squander employees' hours and days on routine, low-value tasks. Shifting routine tasks from to systems helps improve processes and enhance productivity, while also enabling resources to focus their time and effort on higher value activities.

Enabling automated and standardized operations in the organization's "back-office IT" through integrated digital tools, like automated regression test tools, DevSecOps, etc, and enhancing these tools with AI and ML technologies is helping to also provide improved operational insights.

Readiness: ● ● ● ○ ○
Relevance: ● ● ● ● ●

The tech stack goes physical

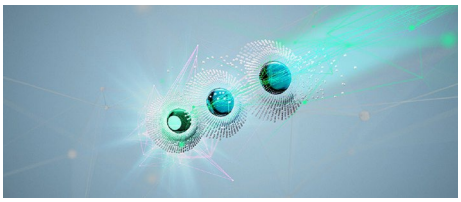
With the explosion of "smart devices" and the increased automation of physical tasks, IT's remit is growing again, extending beyond laptops and phones. CIOs must now consider how to onboard, manage, maintain, and secure such business-critical physical assets as smart factory equipment, automated cooking robots, inspection drones, health monitors, and countless others. Because outages could be business- or life-threatening, devices in the evolving physical tech stack require the highest levels of system uptime and resilience. And a fresh approach to device governance and oversight may be needed to help IT manage unfamiliar standards, regulatory bodies, and liability and ethics concerns. Finally, CIOs likely will need to consider how to procure needed technology talent and reskill the current workforce.

Trends in action

The Oil and Gas industry has been a leader for some time in the adoption of industrial smart devices to reduce the cost of operations and the risk of accidents. As their popularity continues to rise and availability of new devices increases, CIOs of Oil and Gas companies must consider thoughtfully, appropriate operating model choices to support device and data management, innovation governance, and networking landscape management (these devices typically require high levels of uptime and redundancy.)

These considerations will redefine how the technology workforce is organized, managed, trained, and kept upgraded, and require a high-level of collaboration and synergy between traditional IT and OT teams.

Readiness: ● ● ● ○ ○
Relevance: ● ● ● ● ●



Field notes from the future

A bold, technologically sophisticated future awaits—this we know. Yet from our vantage point today, we cannot discern precisely what this bold future looks like, or how we can prosper in it. How can we plan for events that are likely, yet vaguely defined? In Field notes from the future, our final chapter of Tech Trends 2022, we examine the trajectories of three technologies that will likely dominate the digital landscape a decade or more from now: quantum, exponential intelligence, and ambient experience.

Though currently nascent, each of these technologies has captured the imagination of researchers and the investment dollars of venture capitalists, startups, and enterprises who all agree: Something interesting will happen, and with diligence and groundwork planning, we can be ready to act when the future finally arrives.

Trends in action

The technology of the next decade is already starting to arrive. Ensuring that future planning and strategies are implemented with the future's technologies in mind is an important factor in creating future-proof designs and approaches. Don't be backed into a corner by making yesteryear's decisions tomorrow.

Readiness: N/A
Relevance: N/A

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