techminds group

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Digital initiatives in the oil, petroleum and refinery industry to achieve operational excellence

Ever since the Industrial Revolution took place, oil and petroleum have been instrumental in propelling the ever-increasing usage of mechanization. From factories to vehicles, petroleum started being utilized in energizing every sector of human life. People began to depend on oil and its derivatives like never before.

For a long time since **oil and petroleum** was discovered, the above-stated trend had more or less remained the same. Yet, everyone knows that change is the only constant. It is also almost certain that with great success come greater obstacles. The **oil industry,** which has grown by such a large extent, is no exception and today faces certain new-age challenges that need to be addressed. Moreover, with environmental issues on the rapid rise, there are various other energy alternatives to oil and petrol that have started emerging and are posing to become big competitors to this industry. So, the question arises as to what can give the ***oil industry an edge over its upcoming rivals so that it can sustain itself*** in being at the top in its domain.

The answer lies in the new buzzword - **Digital Transformation.**

Digitization, the start of a new era

In today's digitally oriented world, everyone prefers to shift all operations online owing to the ease and convenience offered by virtual interconnectedness. Similarly, the process of **digitization** in the oil industry is disrupting the traditional energy value chain. This is being done by bringing unique digital trends into the industry.

The oil and petroleum industry's approach towards incorporating different **digital processes** is targeted at being evolutionary and not revolutionary. To meet this goal, various **digital solutions** such as ***cloud computing, mobile technology, & big data and analytics*** are being integrated into the industry.

Cloud computing can help augment the business processes by managing all of the companies' big and small functions as well as their automation needs in a cost-effective and scalable manner. With the advent of mobile usage, social media has started gaining a lot of influence. Thus, enterprises can leverage this fact to their advantage by improving **customer relations** through various engagements. At the same time, big data and analytics can improve the business by deeply analyzing large amounts of **structured as well as unstructured data.**

Combining all these trends can increase effectiveness in ways that cannot be done if deployed individually. Doing so will soon result in a high level of connected intelligence to all the oil and petrol arenas - from extraction and field work to end customer delivery. In addition to the improvement in process efficiency, digitization would also allow oil companies to reach out to its customers far better than before.

Use IIoT for intelligent equipment control

IIoT (Industrial Internet of Things) is the latest technology that has the ability to completely transform the **Oil and Petroleum sector** and thus solve a number of practical challenges being faced in various facets of the industry. This technology is an interconnection of various sensors, devices, and multiple industrial instruments with software applications specific to an industry. It can hence be implemented to connect the **field end equipment** used in oil exploration to backend systems for smooth monitoring. Sensors backed by digital solutions leveraging IIoT technology can help make sure the proper functioning and optimum working of **on-field and on-site equipment,** and facilitate the data flow and communication involved in the entire process. **Real-time update** of data from various sources leads to a holistic and up-to-date view that can help stakeholders make informed decisions.

In addition to these features, IIoT can enable proactive **equipment inspection** and prediction of machine failure in advance, thereby reducing the chances of monetary losses to a large extent. Another area of application lies in **materials tracking and transportation.** Since, the industry massively depends on the proper and safe transportation of its commodities, using IIoT can lead to a reduction in wastage. For instance, it can help organizations to not only reduce corruption by minimizing the dependency on unreliable and disjointed middle agencies but also guarantee secure transfer of goods (both raw and finished products) to and from the storage points.

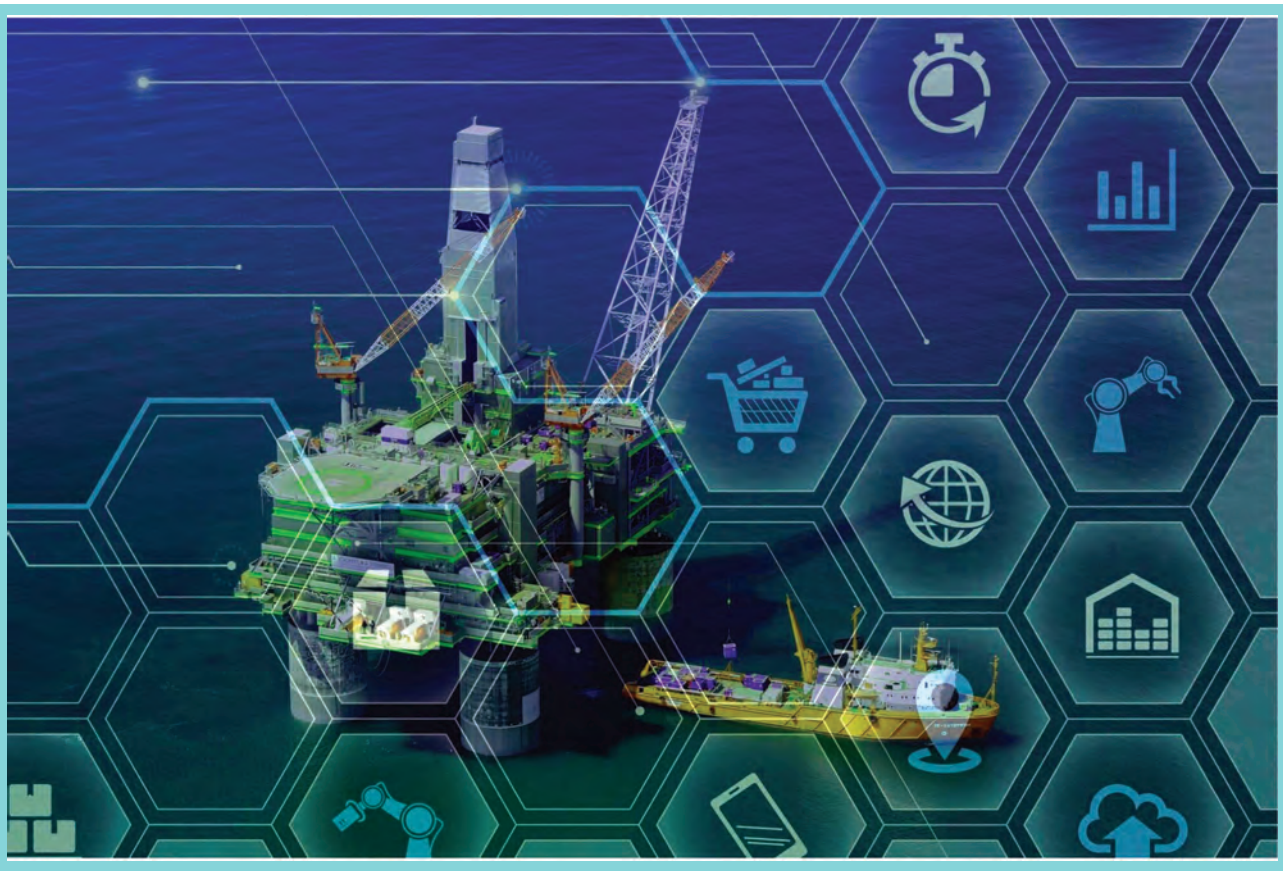
Turning challenges into opportunities

It is already established that the major obstructions faced by the industry lie in the transport chain. To tackle this situation, **digital innovators** have come up with a few techniques that will improve efficiency. One method involves the installation of ***sensors in pipelines and trunk*** lines carrying and transporting oil and gas. This can be used to predict faulty parts and thus, prevent oil and gas leaks. Since oil and petroleum have to be transported over long distances via seas and oceans, at times equipment malfunction can lead to oil spills. Therefore, **installing sensors** on these transporting ship units can prevent these unwanted leaks and hence reduce the chances of water pollution.

Not only on water, can transportation defects occur on land and road as well. ***Fixing sensors in trucks*** and other ***heavy goods vehicles*** carrying oil and petroleum can alert the controllers beforehand and stop any malfunctioning from taking place. Preventive and predictive maintenance of all the transportation equipment can be done to ensure that there are minimal breakdowns.

Digital Transformation thus assures operational excellence of the distribution and logistics in the oil and petroleum value chain. The advantage of remotely and transparently tracking every commodity in the entire supply chain is quite beneficial.

Back it up with smart software



With sensors sending so much data in real-time, there is an inherent need for smart software solutions to capture, process, and analyze the **data for business intelligence** and the ensuing operational performance benefits. Software tech giants such as Microsoft have created specialized software suites that are specific to the oil and gas sector, such that adoption of **digital technologies** can be achieved quickly

Microsoft's cloud computing platform Azure offers tools and services that can help oil and petroleum companies engage in **engineering innovation** in the digital space. These solutions make use of **artificial intelligence** and **machine learning** to provide the best possible services to their customers. Azure offers high-performance computing which allows one to envision different simulations that can occur in an oil reservoir. Enterprises can also make use of **IoT drilling sensors** supported by Azure ecosystem in order to improve production. Effective **asset performance** management can be carried out using **Azure's IoT Solution Accelerators.** This suite makes use of machine learning which can facilitate automation resulting in higher employee productivity while also ensuring the field staff's safety. Oil businesses can easily develop and update power grids with the help of digital twins so as to bring about better energy distribution. This can translate into quicker **production ramp-up time** with cost-efficiency.

Seamless integration of daily operations and business workflows

Organizations are coping with shrinking margins and rising customer expectations. In such challenging market scenarios, an integrated solution suite can help bring all aspects of the business together. Microsoft's Dynamics 365 family brings the **power to enable energy** companies streamline their **business processes management.** This includes customer-centric services, **workforce management,** accounting, asset management, **purchase & order cycles, expense management,** and storage & inventory management, to name a few.

The different advantages that distributors get via digital transformations powered by tools and solutions such as Dynamics 365 include **digitizing field services & project services** in order to manage oilfields. It enables active collaboration between departments, on-field staff and remote controllers, even partner firms to increase visibility and promote trust. Stakeholders can get enhanced reports and dashboards with detailed records and data. With in-built integration with leading **MS tools like Excel or Power BI,** the data can be formatted, analyzed, and channelized for better understanding and setting achievable business goals.

Backed by digital reliability offered by Dynamics 365, oil companies can thus scale newer heights of productivity and success

Digital transparency for optimal planning

Digital tools and technologies enable accurate prediction about the amount of stock needed by *studying the supply trends* and *learning from actual data*. This reduces wastage and leverages the proven just-in-time demand-supply principle. A holistic **end-to-end digitization** of the upstream, **mid-stream and downstream oil value chain** facilitates the complete automation of scheduling different tasks and **workflows** that results in better customer deliveries as well.

Much like any other industry, end-customer expectations have been rising in the oil sector as well. **Digital advancements** can help increase customer value by the use of customer engagement solutions such as personalized offerings, backed by deep customer preference analysis using **AI**. Digital customer solutions can engage omni-channel retail services to create great consumer experiences

Explore and innovate

Digital Transformation for the oil sector needs a cultural mindset change. A unified approach to integrate disparate systems is needed for business acceleration. **Smart and innovative solutions,** supported by state-of-the-art tools and technologies, can assist enterprises to unlock the full potential of digitization.

Techminds offers a rich experience in boutique and custom digital solutions for the oil and petroleum sector across the entire **energy value chain**. Whether you deal with oil sourcing, refining, storing, distributing, or retailing, Techminds can help boost your **digital transformation journey** to stay ahead of the curve

About the Director

Raymond leads our Microsoft Teams at Techminds for Sales and Project Management with a focus on end-to-end services like Discovery, Customization, Training, and Support for Distribution, Manufacturing, and Field Service companies.He has **30+ years of industry ERP experience** helping small to medium size companies manage their budgets but think and grow like Enterprise Corporations. He is highly adept at providing high-level Managed Services on a 24/7 basis monitoring of all devices with the Microsoft 365 toolset for compliance and security. In addition, he supports our **Help Desk** staff and has a reputation of excellent service to customers with focus on individual attention. He has delivered prestigious projects with marquee companies such as Boeing, Shell Oil,Tishman Realty and many other SMB and Enterprise companies.

About the Founder

Mani Subrahmanyam is a Techpreneur with more than 20 years of rich experience in the IT sector including management and technical consultancy in the areas of cloud computing, business intelligence and date management. He is the **Founder and CEO** of Techminds Group where he is responsible for the day-to-day decision management, implementing the organization's short term and long term plans, revenue growth and employee engagement.

Techminds Group was founded in 2007 and has **become an NJFast50 and Inc 5000 winner.**

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