EGYPT'S PETROLEUM
DIGITALIZATION
JOURNEY

ABOUT THIS
SUPPLEMENT

To cope with global changes and innovations, the Egyptian oil and gas sector is walking down a digital transformation path towards a promising digital future. The Ministry of Petroleum and Mineral Resources is adapting the Digital Transformation Program, which comes as the seventh pillar of its Modernization Program that aims to boost the sector's performance. In this supplement, Egypt Oil & Gas sheds light on the petroleum's sector digital revolution and the insights of the industry's most important digital transformation leaders, as well as the expertise of prominent digital solutions providers.

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A PATH TO THE FUTURE

HOW DID THE DIGITALIZATION PILLAR HELP THE EGYPTIAN OIL AND GAS SECTOR NAVIGATE COVID-19 PANDEMIC?

"Today, with an extensive percentage of the workforce working remotely, the employees' experience of digital technology has gone from "optional" to "the only way work gets done".

A key enabler to combat the COVID-19 crisis in the energy sector was Digitalization, which helped improve the safety, productivity and sustainability of our energy systems. Data and how we manage and use it is the key differentiator for success. From using data and analytics to improving business-decision making, to harnessing tools that support and harmonize operational processes."

WHEN AND WHY WAS THE DIGITAL TRANSFORMATION OF THE OIL AND GAS SECTOR DECIDED?

"In 2016, we dedicated a whole program in our Modernization strategy for digitalizing the Oil and Gas sector in order to be more efficient, achieve optimal performance and full monitoring and control over the whole value chain to take well informed decisions."

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HOW MANY DIGITAL TRANSFORMATION PROJECTS WERE INITIATED SO FAR?

"Over 70 digital transformation projects were initiated and various success stories were achieved through the value chain."

HOW IMPORTANT IS THE EGYPT UPSTREAM GATEWAY EUG FOR EXPLORATION AND PRODUCTION (E&P)?

"The EUG is a world-class national E&P data repository that preserves legacy data, manages the active data and promotes investment opportunities through international bid rounds to accelerate E&P activities."

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WHAT ABOUT THE DIGITAL TRANSFORMATION OF THE MID-STREAM?

"In the Mid-Stream activities, we established the National Advanced Transmission and Automation Center (NATA). It underwent an upgrading project in 2020 to replace the existing SCADA system with highly sophisticated integrated system that enables high control of gas transmission and distribution and analysis for failure or leakage via an advanced package of software applications."

SOUNDS GREAT, WERE THERE ANY OTHER COMPANIES DEVELOPED ACCORDING TO THIS?

"Currently, we are working on implementing the same project over crude oil and petroleum products to ensure control over them through the Egyptian Petroleum Pipelines Company.

HOW WAS ENTERPRISE RESOURCE PLANNING (ERP) HELPFUL TO THE OIL AND GAS SECTOR?

"We implemented several Enterprise Resource Planning (ERP) projects to automate and optimize workflow, and to enable formulation of well-informed decisions. "

"EGPC and Holding companies have full operating ERP systems, as well as most of our affiliates across the value the chain, in addition to all refineries."

> EGPC and Holding companies have full operating ERP systems, as well as most of our affiliates across the value the chain, in addition to all refineries.

HOW WILL THE EXECUTIVE COMMAND CENTER (ECC) AFFECT THE SECTOR?

"We are also executing an Executive Command Center (ECC) for the Ministry of Petroleum and Mineral Resources at the new Ministry's Head Quarter at the New Administrative Capital."

"This ECC shall provide an umbrella for centralized decision-making support for the Oil and Gas Sector leaders, where an Executive Support System specifically designed to facilitate and support senior executive information and real-time decision-making needs."

HOW DOES THE SECTOR NOURISH A DIGITALLY ORIENTED CULTURE?

"Several digital Transformation Teams were established within sector companies to carry-on the digital transformation initiative and sustain the digital transformation process within different companies' activities."

WHY IS IT IMPORTANT TO ADOPT THE DIGITAL TRANSFORMATION CULTURE?

"Digital transformation isn't just transforming processes into the digital world; it's about having a culture that adapts to such kind of change. It's not only the role of IT that can take us through the journey of digital transformation; it's each and everyone's role to embed the digital transformation processes and culture in our day-to-day activities."

OVERVIEW

EUG: A SUCCESS IN A TIMELY MANNER

BY SARAH SAMIR

The Egyptian oil and gas sector launched the first digital upstream platform, the Egypt Upstream Gateway (EUG), taking a wide step towards the digital transformation of the upstream sector. The EUG was established to be a giant exploration and production (E&P) national data repository that helps the sector accelerate its E&P business and attract investments through launching digital international bid rounds.

EUG ESTABLISHED

In 2020, the Egyptian General Petroleum Corporation (EGPC) and Schlumberger had signed a memorandum of understanding (MoU) to establish and operate the EUG, which was successfully launched a year later in February 2021.

The Egyptian oil and gas sector has a long history of upstream operations and a vast amount of data that need to be well structured and preserved. This huge amount of data triggered the idea of having an innovative digital platform to manage the upstream data and grant digital access to more than 100 years of accumulated non-seismic, seismic, production, well-log, and other subsurface data for offshore and onshore exploration.

> ❝ *EUG reflects the Ministry of Petroleum vision for attracting new upstream investments through digital promotion platforms.* ❞

GEO. Ashraf Farag *First Undersecretary For Agreements & Exploration Ministry of Petroleum & Mineral Resources*

"In a world of constant changes, digitalization became a pivotal enabler that allows the oil and gas industry to add value to the business operation by reducing costs, increasing productivity, and improve the decision-making process," Minister of Petroleum and Mineral Resources, Tarek El Molla, previously stated during the EUG launching ceremony.

"EUG was really initiated as part of the upstream investment attraction pillar, the first pillar of the Modernization project. At that time, the team was thinking of innovative tools to digitally store the huge E&P data acquired over more than a century and exits with old formats at the information center and then the management thoughts to extend the EUG scope to drive the geological and geophysical (G&G) value from the data through regional studies to successfully help promoting the investment opportunities," Ashraf Farag, First Undersecretary for Agreements and Exploration, Ministry of Petroleum and Mineral Resources, noted.

Mohamed Radwan, EUG Project Manager, Ministry of Petroleum and Mineral Resources, agreed, saying that "EUG is key outcome of the Modernization project with key focus on upstream investment attraction through deriving the technical value from the E&P big data."

"The Minister's strategy was a key enabler to accelerate the project timelines and delivery of the platform in less than a year," Farag added.

OBJECTIVES OF EUG

As the Egyptian petroleum industry thrives, the EUG comes to leverage technologies and data to accelerate oil and gas discoveries, and to enable digitization in order to modernize the sector. It is set to digitally promote the country's bid rounds through an easier and faster access to the oil and gas sector's online data.

The vision of the EUG according to Farag is to "optimize the value of E&P data by attracting global investment to the upstream sector to boost production." Meanwhile, he noted that the EUG mission is to "build a fully integrated platform for Egypt to enable seamless data access and

offer the opportunity to explore new plays, prospects and evaluate basins' potential."

EUG aims to promote E&P investments opportunities on a global scale, and it targets helping the Egyptian oil and gas sector reposition itself on the international investment map. "EUG reflects the Ministry of Petroleum vision for attracting new upstream investments through digital promotion platforms," Farag pointed out.

The platform will enable online data delivery and visualization, besides it will offer trusted and secure data trading through the EUG portal.

The EUG portal will further guarantee access control for proprietary data, and it will have a virtual data room that has application access as well as workflow, representing a successful bid round licensing platform.

EUG SUCCESS

The upstream platform was launched in time that helped the Egyptian oil and gas sector operate during the lock-time and social distancing procedures caused by COVID-19. "It's worth mentioning that launching EUG during Coronavirus circumstances was a key facilitator for bid round data rooms," Farag noted. The EUG encouraged many major IOCs, including Wintershall Dea, Apache, and Eni to sign membership agreements in the platform. These agreements show the trust of IOCs in the EUG.

"During the launch event of the EUG on February 2021, His Excellency Eng. Tarek el Molla recommended the effective and practical use of the platform through launching the first digital bid round, making the best use of the project infrastructure and resources," Farag stated.

In February 2021, Egypt announced the launch of its first digital international bid round through the EUG. The bid round included 24 blocks in the Eastern Desert, the Western Desert, the Gulf of Suez, and the Mediterranean Sea.

"Having the bid round launched, EUG provides virtual data rooms for IOC's to remotely evaluate the offered blocks and the team proactively engaged with them for finalizing the EUG memberships and data confidentiality contracts. The team hold many virtual and physical events to technically promote the potentials of the offered blocks with successful market engagement," Farag pointed out.

Establishing the EUG was a significant leap towards the digitalization of the Egyptian oil and gas sector. It helps Egypt boost upstream investments. Moreover, it is a key enabler for remotely obtaining, and managing data, and for launching bid rounds amid the time of the COVID-19 pandemic.

> ❝ *EUG is key outcome of the Modernization project with key focus on upstream investment attraction through deriving the technical value from the E&P big data.* ❞

MOHAMED RADWAN *EUG Project Manager, Ministry of Petroleum and Mineral Resources*

EGYPT'S PETROLEUM DIGITALIZATION JOURNEY

BY SARAH SAMIR

The Egyptian oil and gas sector has been walking a path for digital transformation in order to boost the sector's potential and attract investments. Egypt Oil & Gas Newspaper has interviewed a number of petroleum experts who played a role in the digitalization program, which comes as the seventh pillar (P7) of the Ministry of Petroleum's modernization project.

INITIAL ATTEMPTS

The attempts to digitalize the Egyptian oil and gas sector have been going on for a few years, and it starts to bear fruit. "Since the inception of Egypt's Oil and Gas Modernization project in 2016, the Ministry had a leading vision for leveraging the transformative power of digital transformation to enhance the sector value chain activities, and support unlocking its full value," according to Osama Mobarez, Undersecretary for the Minister's Technical Office.

"The digital transformation program has evolved throughout the course of the sector's modernization journey, where phase 1 of the digital transformation program primarily focused on utilizing data to support decision making and increasing data flow across the sector entities," Mobarez added.

Information is perceived as the new oil, and therefore "The ministry is currently undertaking several projects involving the 5 pillars encompassing the digital transformation portfolio set by the Ministry to achieve a comprehensive digital transformation process," Ashraf Bahaa, EMC Chairman and Managing Director, Digital Transformation Program Sponsor, noted.

Additionally, Agiba Petroleum's General Manager of Information Technology and Communication, Field Development Projects Group Manager, Mohamed Abouelmagd, stated that "P7 started the task with wide implementations of ERP in sector's companies to improve business process and control Companies assets. In 2021, the P7 continue its mission with ERP Implementations in Addition starting to build an executive commend center which will monitor the oil & Gas value chain."

VISION 2030

The digital transformation of the oil and gas sector comes in line with Egypt's sustainable strategy and Vision 2030. "The oil and gas sector is one of the main contributors to the GDP and hence comes its importance. The project aims to optimize the overall production and reduce the operational costs affecting the overall ROI and directly impacting the quality of life which is the first objective of the vision," Ahmed El Saeed, Supervisor of the Information Technology and Digital Transformation department at the Ministry of Petroleum and Mineral Resources, , Operations and Command Centers Projects Group Manager, explained.

"Data Analytics and performance indicators helped monitor the quantitative targets and the impact of digitalization on the economic and environmental aspects of sustainable development strategy (SDS) - Egypt vision 2030." Mona Gamal El Din, EGPC's CEO Deputy Assistant of transportation and products distribution for automatic control and monitoring systems, Studies and Consultation Manager, Digital Transformation Projects Management Office agreed.

"The Ministry's digital transformation program main objectives perfectly align with the programs and projects set by Egypt's vision 2030 to drive all Egyptian institutions into digital ones to enhance efficiency and transparency and to establish Egypt as a global digital hub," Osama Salem, Digital Transformation Program Manager, and Business Development General Manager at the Petroleum & Process Industries (ENPPI), stated.

"The Ministry's digital transformation program main objectives are to create a digital transformation strategy and an execution plan for the entire oil and gas sector, so as to avail real-time data and business intelligence at an executive level to support decision-making and crisis management, including linking the Egyptian General Petroleum Corporation (EGPC), the Egyptian holding companies and their affiliates under a unified network. Through such an approach, the Egyptian oil and gas sector shall be digitally transformed and shall gain a competitive edge for the digitally-enabled businesses, increase business value through optimizing operations, increase companies and businesses agility, and create new business opportunities through cross-industry partnerships between Oil & Gas companies and Technology Companies," Osama Salem added.

Ahmed Ghassan El Mobasher, EGPC's CEO Deputy Assistant for Planning and Projects, ERP Projects Management Office, agreed, saying that "digital transformation in Egypt is an essential part of the national strategy towards achieving Egypt Vision 2030 for sustainable development aiming at transforming Egypt into a central hub for communications and technology at the regional and global levels."

Not only the digital transformation program, but the objectives of the modernization project go in line with Vision 2030. Dawlat Hashem, EGAS Assistant Chairman for Communication & Information Technology, ERP Projects Group Manager, noted that "the modernization project's main goals are sector governance and accountability, as well as supporting financial sustainability and fiscal balance."

"The ERP pillar support in the implementation of the ERP system and maximize the benefits of the existing one to be able to achieve MOP vision to reach a real-time integration between all holding companies, their affiliate companies, and MOP," she added.

ADAPTING TO TECHNOLOGY

The Egyptian oil and gas sector is not new to technology; it has been operating digitally for 60 years. "The oil and gas is a technology-based industry as all industrial sites apply automation and control technology

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Osama Mobarez
Undersecretary for the Minister's Technical Office.

> ❝ While implementing a sector wide digital-transformation program, building a digital culture within every company is a necessity to drive sustainable action and create value for all stakeholders. ❞

Ashraf Bahaa
Chairman and Managing Director at the Egyptian Maintenance Company (EMC), Digital Transformation Program Sponsor.

> ❝ **Through continued collaboration and positive engagement with the sector partners, including major IOCS, service companies and technology providers, Egypt's oil and gas sector is fully embracing digital transformation.** ❞

Ahmed Osama
Strategy and Technical Affairs Unit Head, Technical Office, Ministry of Petroleum and Mineral Resources.

in operation," according to Inas Osman, EGPC's Chairman Assistant for Information Technology and Communications, IT Infrastructure Projects Group Manager.

The sector has been working on adapting to new technologies, paving the way for the digital transformation goals. "Luckily enough, the sector has developed a growing appetite for adopting technology more than ever before. This plan was divided into two main parallel routes. The first was to launch a sector-wide technological infrastructure upgrade project, making sure that all gaps that could hinder digital transformation was addressed and resolved. Its second route was to utilize high-end technologies in huge data analytics, artificial intelligence and predictive analytics solutions which would enable precise and correct information decisions (data-driven), resulting in better operational visibility, and leading to increased profitability, and the achievement of the sustainability goals of the petroleum and gas sector," Heba Kassem El Serafy, the Gulf of Suez Petroleum company (GUPCO)'s Assistant General Manager for Information Technology and Telecommunications, Data Analytics Projects Group Manager, explained.

The petroleum sector further adapts to technology "by setting the appropriate roadmap and with the help of specialized consultants." This way "the sector is adopting the philosophy of business transformation, not just digital transformation. Through which work methods are developed to eventually lead to the integration between them, in order to obtain the complete information in real time in order to make the right decision at the right time," according to Wael Hendawy, ECHEM's General Manager of Systems, Information and Communications, Agreements Manager - Digital Transformation Projects Management Office.

NOURISHING DIGITAL CULTURE

The digital transformation of the petroleum sector is not only about using digital methods in operation, it is a culture to be spread among people. "The digital transformation process and the cultural change that make it successful is a multi-stage process that requires in-depth planning and keen follow-up. Therefore, while implementing a sector wide digital-transformation program, building a digital culture within every company is a necessity to drive sustainable action and create value for all stakeholders," according to Bahaa.

In order to ensure a digital-oriented culture across the oil and gas sector, several directions have been followed. "First direction is to build proficient human capacity across the sector who will be capable to grasp and utilize these new emerging technologies and lead the digital transformation journey of the Egyptian Oil and Gas Sector. On this regard, in-company digital transformation teams have been established within several Sector companies to initiate the change management process towards building a digital-oriented culture and ensure the sustainability of the digital transformation process with the Egyptian Oil and Gas Sector. The second direction is to always be acquainted and familiar with the latest proven technologies in the field of digitalization. This is achieved by building and maintaining a partnership with world-class technology providers and constantly engaging them in the different technology-related projects within the sector," Bahaa noted.

CHALLENGES FACING P7

Every successful project is faced by challenges and obstacles that can hinder it, but if they were dealt with in the right way, they can sharpen the project and enhance its progress. The digital transformation pillar is likewise. Bahaa suggested that "the main facet that has the biggest impact on having a successful and sustainable digital transformation process is the sector leaders and executives' support."

"Digital transformation needs sector leaders support throughout the entire digital transformation journey. During the change management process, organizations and people tend to fall back to the conventional way of doing business, and without the sector leaders and executives constant support to realize the digital transformation no progress would have been achieved," Bahaa explained.

In order to solve this challenge, it has become crucial for the oil and gas sector to ensure a digital-oriented culture and spread digital awareness among its people. "That is why the digital transformation program is keen on establishing digital transformation teams within each sector company that will oversee the full digital agenda. The digital transformation teams shall be the foundation of a truly changing culture through every company within the sector and shall support the digital transformation flow through the management hierarchy right down to every front- line employee so that the full organizational pyramid is tuned towards digital," Bahaa said.

P7 TEAMS, DECISION-MAKERS

Once P7 was adapted, a digital transformation team was formed. "The formation of program 7 team responsible for the digital transformation of the oil & gas sector according to the minister's decree brought together an elite team from across the oil and gas sector whether from the ministry of petroleum, the holding companies and the affiliated companies," El Saeed stated.

The digital transformation team "acts as a link between the three layers to ensure smooth business transition and helps support the digitalization objectives," he noted.

The P7, which has five sub-pillars, "focused on reaching the final goals and that is satisfying the needs to build a unified command center, involving state of the art technologies such as artificial intelligence, advanced data analytics, big data analysis, using case analyses, data

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Ahmed El Saeed
Supervisor of the Information Technology and Digital Transformation department at the Ministry of Petroleum and Mineral Resources, Operations and Command Centers Projects Group Manager.

visualization .... among many others," according to El Saeed. All these goals have "alignment with the fourth industrial revolution, which aims at achieving autonomous decisions making across the different decision levels available in the sector, by which the needed data for making a decision is left at the palms of every decision maker in every affiliate company, central command point, holding company, and of course MOP eventually," he explained.

66 **EGPC initiated a number of Datacenters renovation and infrastructure upgrade in its affiliated companies. This also included increased communication bandwidth and information security controls. IT facilities and infrastructure are now ready to host and operate the running projects.** 99

Inas Osman
EGPC's Chairman Assistant for Information Technology and Communications, IT Infrastructure Projects Group Manager.

Bahaa also confirmed that the ERP and executive command center, as well as the other main projects undertaken by the ministry "encompass the digital transformation portfolio set by the Ministry to achieve a comprehensive digital transformation process."

ACTIVE PROJECTS SUPPORTING DIGITALIZATION

In order to walk the digital transformation path, the Egyptian oil and gas sector has undertaken several projects. "These projects encompass the entire sector activities from upstream, midstream to downstream activities," El Mobasher stated.

"The project I want to emphasize upon is the establishment of comprehensive ERP systems at EGPC, and national sector refineries, project that is within the final phase and will be launched soon. This emphasize comes from the importance of the ERP systems to the digital transformation portfolio of the Egyptian oil and gas sector," he noted.

Bahaa also confirmed that the ERP and executive command center, as well as the other main projects undertaken by the ministry "encompass the digital transformation portfolio set by the Ministry to achieve a comprehensive digital transformation process."

El Mobasher described the ERP systems as the digital transformation platform, saying that "ERP technology provides an over-arching system that seamlessly link with any industrial control systems and is capable of maximizing the business value chain from the enormous information feed now available from the industrial control systems and technologies to the ERP systems and business intelligence technologies."

"By providing the accurate architecture to link, ERP systems has the capability of bringing revolutionary changes in various processes of modern business. ERP software integrates all aspects of your business operations, leading to greater efficiency, speed, and customer satisfaction. Also, ERP gives decision-makers access to much richer data and allows greater insights into every stage of the Oil and Gas value chain. This is in turn makes businesses more agile, and better able to respond to, or even anticipate, the market dynamics," he explained.

POTENTIAL AGREEMENTS & DIGITALIZATION INFRASTRUCTURE MILESTONES

When it comes to digitalization, the oil and gas sector makes sure to partner with expert digital solutions' providers to deliver the best outcome. "Collaboration is a key factor for success, especially to seize all available opportunities for creating more value in Egypt's oil and gas sector. This has always been, and will continue to be, the philosophy adopted by the Ministry of Petroleum and Mineral Resources, and is evident in the longstanding and prosperous partnerships with IOCs, global service companies and world-class technology providers," Mobarez stated.

"Through continued collaboration and positive engagement with the sector partners, including major IOCS, service companies and technology providers, Egypt's oil and gas sector is fully embracing digital transformation and creating synergies within its domain to support realizing the sector's vision and ambitions," Ahmed Osama, Strategy and Technical Affairs Unit Head, Technical Office, Ministry of Petroleum and Mineral Resources, agreed.

Hendawy further explained that "the purpose of contracting agreements is to achieve the best solutions with better prices and services. In this context, agreements have been concluded with a number of international companies, among these companies: SAP, AVIVA, Schneider, OSI Soft, and others. A study is underway to conclude agreements with other companies in the areas of software, hardware and specialized systems."

On digital milestones, Osman stated that "digital transformation projects differ in requirements according to the type of application, number and type of users." She added that "EGPC initiated a number of Datacenters renovation and infrastructure upgrade in its affiliated companies. This also included increased communication bandwidth and information security controls. IT facilities and infrastructure are now ready to host and operate the running projects."

PLANNING RESOURCES

The digital transformation program has an integrated strategy, which together with "programs and their key activities are aligned with the various stakeholders in the planning stage with clear roles and responsibilities for each; ensuring resource allocation is done as early as possible. During implementation, reporting dashboards ensure everyone is updated with progress and any issues are addressed before they jeopardies program completion," Hashem noted.

Moreover, Hashem pointed out that several "key design, resources planning and project management systems are used throughout the phases of the digitalization program, and a strategic work track that is receiving a lot of executive attention is the development and training of the sector's human assets in technology leadership roles to ensure continuity and future-proof the project's strategic outcomes."

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Dawlat Hashem
EGAS Assistant Chairman for Communication & Information Technology, ERP Projects Group Manager.

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Wael Hendawy
ECHEM's General Manager of Systems, Information and Communications, Agreements Manager - Digital Transformation Projects Management Office.

ECC SUPPORT SENIOR EXECUTIVES

Digital transformation measures, especially command centers, have great impact on the development of the oil and gas industry. Osama Salem suggested that such an impact can be feasible thanks to "the value that command centers can bring into the oil and gas industry, where an immense amount of data and information covering all sector operations can be collected, monitored, analyzed, and processed further to drive the business value chain."

Therefore, the Egyptian petroleum sector's digitalization objectives include establishing command centers "to provide an umbrella for centralized decision-making and crisis management support with the vision of enhancing operation efficiency, optimize operation and respond to market dynamics. The Command Centers shall host several advanced technologies that leverage artificial intelligence, big data, predictive analytics, and other advanced technologies to help realize the Ministry's vision towards a digitalized sector," according to Osama Salem.

66 **ERP technology provides an over-arching system that seamlessly link with any industrial control systems and is capable of maximizing the business value chain from the enormous information feed now available.** 99

Ahmed Ghassan El Mobasher
EGPC's CEO Deputy Assistant for Planning and Projects, ERP Projects Management Office.

TECHNOLOGY & SOFTWARE

Digitalization of the oil and gas operations is a significant approach to enhance field performance."Oil & Gas value chain has a wide operation technology landscape responsible for running the core operational services. Our commitment is to provide the command centers with real time automated data to reflect one single version of truth and build a complete picture of the Oil & Gas Value chain to support decision making processes." Abouelmagd said.

The digital transformation team is committed "to provide the command centers with real time automated data combined with the IT data to reflect one single version of truth and build a complete picture of the Oil & Gas Value chain to support decision-making processes," he pointed out.

"Egypt's oil and gas sector applies technology across all its value chain activities, from exploration and production activities to refining and petrochemicals," Ahmed Osama stated, setting the Egypt Upstream Gateway (EUG) as an example. "The sector is also implementing multi-client and seismic survey projects to support in unlocking Egypt's full potential of oil and gas resources through applying sophisticated data

processing and interpretation. The sector is similarly expanding use of the latest technologies across the other value chain activities to continuously improve performance and add more value," he added.

66 **Our commitment is to provide the command centers with real time automated data to reflect one single version of truth and build a complete picture of the Oil & Gas Value chain to support decision making processes.** 99

Mohamed Abouelmagd
Agiba Petroleum's General Manager of Information Technology and Communication, Field Development Projects Group Manager.

Using the right software can take the digital transformation journey to success. "The digitalization program employs various high-end engineering and analytics applications for asset integrity management, predictive maintenance and 3d modeling, while ensuring process optimization and full integration between all solutions," El Serafy noted.

The oil and gas sector adopts a flexible strategy that meets business goals, "while avoiding environmental impacts and eliminating process bottlenecks, maximizing throughputs and revenues, increasing process flexibility, and minimizing emissions. All this should be done provided that the targeted return-on-investment goals of each company are met with no safety issues nor suboptimal production rates," she explained.

MIDSTREAM, DOWNSTREAM DIGITALIZATION

The digital transformation program goes beyond upstream and field development. "The digital transformation process is widely deployed across the entire sector and aimed at the entire business activities, including upstream, midstream, and downstream activities, as the ministry strategy is aiming at delivering a comprehensive digital transformation for entire Egyptian Oil and Gas Sector. This is evident in the various digital transformation projects across the entire sector," Bahaa said.

One of the digital solutions adapted in this level is installing GPS on fuel trucks. "A central control room at EGPC is actively tracking more than 4000 fuel trucks types all across Egypt, beside monitoring system at each marketing and transportation company tracking its owned trucks, through a GPS monitoring and tracking system comprising of GPS devices installed on board each vehicle and a central control application," Gamal El Din, noted.

Thus, the digital transformation pillar significantly affects several levels of the industry as it aims to develop the different operations of the oil and gas sector. Following the integrated digitalization strategy will help the Egyptian oil and gas sector to be sustainable, while it meets the goals of the country's vision 2030.

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Heba Kassem El Serafy
Gulf of Suez Petroleum company (GUPCO)'s Assistant General Manager for Information Technology and Telecommunications, Data Analytics Projects Group Manager.

CONNECTING THE DOTS:
EGYPT'S OIL & GAS DIGITALIZATION STORY

BY SARAH SAMIR

I n a world that is undeniably digital, the Egyptian oil and gas sector is advancing through the digital transformation program, which comes as the seventh pillar of a modernization project. The program aims to transform the oil and gas sector into one that operates digitally on a wider scope.

For the past 60 years, the Egyptian oil and gas sector has been operating digitally. This digital adaptation can be seen in the technologies that have been used in the oil and gas sector, such as the Supervisory Control and Data Acquisition (SCADA) systems, the Distrusted Control Systems (DCS), and the smart and digital instruments used in companies and fields.

DIGITAL TRANSFORMATION OBJECTIVES & PORTFOLIO

The digital transformation portfolio has major pillars that support it in achieving its objective. These pillars include Enterprise Resource Planning (ERP) systems, as well as establishing command centers, such as the Executive Command Center (ECC) that is under construction at the new headquarters of the Ministry of Petroleum and Mineral Resources (MOP) in Egypt's New Administrative Capital.

 Additionally, other command centers will be established at four main oil and gas holding companies. This will include the Egyptian General Petroleum Corporation (EGPC), the Egyptian Natural Gas Holding Company (EGAS), the Egyptian Petrochemicals Holding Company (ECHEM), and Ganoub El-Wadi Petroleum Holding Co (GANOPE).

Moreover, the digital transformation portfolio works on developing IT infrastructure, which includes network services, composite hardware, software, and resources. This comes as the sector recognizes the software and technologies that are crucial for digital transformation. The digitalization program also includes Data Analytics Software and field development.

When it comes to the objectives of the digital transformation program, one can see that they are convenient and feasible. "We are very honored to be working closely with the Ministry of Petroleum & Mineral Resources on its focused efforts in its Digitization Program which aims at improving the efficiencies, reducing costs and improving the workforce; to develop a resilient oil and gas sector that could cope with the opportunities and challenges on the domestic, regional and global levels," Hoda Mansour, EMEA South Head of Business Process Intelligence (BPI) at SAP.

The oil and gas sector's digitalization aims to enhance the sector's decision-making schemes and provide support when facing a crisis. Moreover, the strategy can help prioritize which projects should be implemented when it comes to the digital transformation of the sector's companies. It also takes into account the integration between the sector's various

entities, the standardization of designs, and the strategies needed to implement a unified system for managing the petroleum sector's resources and assets.

The digitalization program further aims to connect EGPC, the holding companies, and subsidiaries of the oil and gas sector together through a unified network. It empowers the sector to study the existing information systems in various companies, which can help in developing and integrating them into an established centralized system. This can be executed by taking into account the integration with the existing industrial control systems in the sector's various activities while maintaining the confidentiality of information.

Another objective of the ministry's digitalization program is setting general guidelines for digital transformation of all projects that will be implemented throughout the program to unify and integrate all relevant future projects in the petroleum sector.

Moreover, the program has taken measures to prevent disruption in any company's activities while the digital reforms are being implemented. Additionally, it aims to cultivate a culture of change through facilitating enhanced professional interaction. In doing so, the sector will be able

to accommodate the open exchange of knowledge, ideas, and experiences by bringing teams working in the industry closer together.

"The Massive digital transformation running at the O&G sector led by the ministry as part of Egypt Strategy 2030 is going to reshape the future of this sector, the impact of this transformation will be starting from investment optimization and accelerated ROI till we reach to productivity, maintenance cost efficiency and asset performance management and definitely will support along the journey the Sustainability and optimize CO2 footprint," Ahmed Madkour, Vice President Industry at Schneider Electric North East Africa & Levant, told Egypt Oil & Gas.

DIGITAL TRANSFORMATION ACHIEVEMENTS

In light of the digitalization program's objectives, the seventh pillar of the modernization project has helped the oil and gas sector achieve notable success, in cooperation with its strategic partners "Schlumberger is proud to be the country's oil and gas performance partner of choice in its digital transformation journey. The progressive vision of the Ministry of Petroleum digitalization journey was a key enabler for key initiatives such as the Egypt Upstream Gateway [EUG], and the Egypt Production Digital Center [EPDC], both of which went live in a short period of time, with the set goal to equally enhance the understanding of Egypt's subsurface offering and unlocking the full potential of its assets to meet the energy needs in addition of providing a new platform to attract new foreign investments," Sherif Bayoumy, Managing Director at Schlumberger Egypt, Sudan & East Mediterranean, told Egypt Oil & Gas.

MOP took a crucial successful step when it launched its first digital upstream portal "Egypt's Upstream Gateway", which aims to attract investments to the research and exploration business. This investment attraction falls under the first pillar of the modernization project. In February 2021, "Egypt Upstream Gateway" started the first exploration and production (E&P) bid round on its digital portal. The bid round is set for E&P in 24 blocks.

Additionally, in light of the Digitalization program, Schlumberger and Sensia inaugurated the Egypt Production Digital Center (EPDC) in July. The EPDC is set to digitize the production data coming from the country's producing assets.

Moreover, the sector established the Egyptian Natural Gas Company (GASCO)'s National Advanced Transmission and Automation control center (NATA center) in 2003. Since its establishment as the main SCADA center in GASCO, it has been helping the company to manage and maintain its national gas network through executing consumption and production plans, issuing operational reports, and carrying out MOCK Drills preparations.

To advance further progress in the digitization program, around 70 digital transformation projects have been initiated that are in line with several aspects of the ministry's digitalization vision. These projects include ERP projects across 6 public sector refineries. The ERP systems interconnect all processes within an entity. It supports digital transformation, especially when the user implements the ERP based on the best practices in the industry, in terms of system applications and business processes.

The Amerya Petroleum Company and Alexandria Petroleum Company (APC)'s ERPs were planned to go live by the end of 2021-early 2022. Meanwhile, the remaining refineries are set to go live in sequence, starting with the Suez Oil Processing Company (SOPC), the Nasr Petroleum Company (NPC), followed by the Cairo Oil Refining Company (CORC), and the Assiut Oil Refining Company (ASORC).

One of the most notable achievements that have taken place is the ongoing establishment of the panoramic ECC that will be introduced at the ministry's headquarters in the New Administrative Capital. The ECC is set to be a real-time data visualization and fully integrated center. It will have advanced technologies that support artificial intelligence and big data, in addition to advanced technologies that respond to market dynamics and optimize operational performance. This is all part of the ministry's strategy to identify new pathways to boost business efficiency and eventually unlock the sector's value chain potential.

Moreover, the ministry's vision is to establish in-company digital transformation teams to commence with the digital transformation process. These teams' responsibilities will involve implementing the necessary reforms within the management process and ensuring that the companies' activities are aligned with the digital transformation program. Throughout all the digital transformation efforts and achievements the ministry did not neglect cyber security.

ADAPTING TO TECHNOLOGY

The Egyptian oil and gas sector has been using digital solutions and advanced technologies across multiple levels and activities.

The MOP is planning to enable the Egyptian Petroleum Pipeline Company (PPC) to have the same SCADA control over crude oil and petroleum products network. GASCO and PPC have signed a cooperation protocol to exchange expertise and share knowledge.

Over the past two years, to cope with the changes imposed by the coronavirus pandemic, the Egyptian oil and gas sector has been discussing important issues via video conferences. Moreover, the companies operating in Egypt have been resorting to live webinars to ensure social distancing.

The path to digital transformation has been open for the Egyptian oil and gas sector, which has been using digital tools to progress both in the past and at present. MOP has been supporting all the steps taken by the sector towards the digital transformation and empowering the sector's companies to adapt to the new digital reality of today's global market.

❝ *We are very honored to be working closely with the Ministry of Petroleum & Mineral Resources on its focused efforts in its Digitization Program which aims at improving the efficiencies, reducing costs and improving the workforce* ❞

Hoda Mansour
EMEA South Head of Business Process Intelligence (BPI) at SAP.

❝ *The impact of [digital] transformation will be starting from investment optimization and accelerated ROI till we reach to productivity, maintenance cost efficiency and asset performance management and definitely will support along the journey the Sustainability and optimize CO2 footprint,* ❞

Ahmed Madkour
Vice President Industry at Schneider Electric North East Africa & Levant

❝ *The progressive vision of the Ministry of Petroleum's digitalization journey was a key enabler for key initiatives such as the Egypt Upstream Gateway [EUG], and the Egypt Production Digital Center [EPDC],* ❞

Sherif Bayoumy
Managing Director at Schlumberger Egypt, Sudan & East Mediterranean

Thousands of data points. One system to manage them all.

System 1 condition monitoring software is industry's all-in-one answer to even the most difficult asset management and machine-health monitoring challenges. It gives you unprecedented analytics capabilities and the deep insights needed to get your plant running smoother and avoid unwanted downtime.

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a Baker Hughes business

WHY DELL TECHNOLOGIES FOR OIL AND GAS

DELL TECHNOLOGIES LEADERSHIP IN OIL AND GAS

We use that collective force of innovative capabilities in Dell Technologies to establish ourselves as a transformation leader in the Oil & Gas industry, as these 7 points demonstrate:

Dell Technologies collaborated with a geoscience software vendor to deliver the 1st Petrotechnical Cloud appliance based on the ground-breaking hyper-converged infrastructure technology

» The 1st multi-petabyte Scale-out NAS solution for seismic data was made possible through the Dell EMC PowerScale storage solution

» We delivered the 1st hyper-converged National Hydrocarbon Data Repository (NDR), bringing the power of commodity hardware to the world of NDRs in a secure and scalable way

» The 1st Cloud Archive solution for sub-surface project data was delivered using Dell Technologies ECS (Enterprise Object Storage) object storage technology

» The top 5 Oil & Gas ISVs (Independent Software Vendors) have validated their E&P software suites on Dell EMC infrastructure, both Storage for data lifecycle management and compute for application delivery – Halliburton, Schlumberger, IHS Markit, Emerson, Ikon Science

» Over 90% of the top 25 Oil companies use Dell Technologies infrastructure – from geoscience workstations, to scalable data management to application delivery and analytics, to multi-cloud.

» Dell Technologies delivers IT infrastructure that has passed 10 critical Marine/Offshore Safety Standards for running sustained remote Offshore operations

THE NEXT EVOLUTION OF DIGITAL OILFIELDS

OIL AND GAS CONNECTED DIGITAL OPERATIONS

The future of digital oil field (DOF) enablement is expected to continue to grow and increase over the coming years to focus on next-level efforts for predictive maintenance and prevention and dynamic services engagements to avoid costly field operations events that degrade Return on Investments. The next era of DOF being further enabled with IoT/Edge, AI, 5G... is expected to cover not just field operations for internal employees, but all services providers from all internal and external companies.

Beyond just the care and feeding of the field assets, DOF is moving towards fully integrated diagnostics with preventive and prescriptive "Total Field Health" awareness and promotion, and will be a huge area of primary focus. Dell's Connected Digital Operations platform will ensure field operations personal are always ready with integrated surveillance, monitoring and control capabilities to quickly understand field conditions in real time for tactical and strategic efforts.

This platform enables complete integration across the entire field life-cycle enabling, mass balancing across the production network, and predictive optimization across the entire field and its interconnected workflows, hand-offs and custody transfer units. The Dell's Connected Digital Operations Platform takes the next steps in expanding inter-connectivity across all data, systems and infrastructure in relevant time (real or other) aligned to key Roles and in full Context of the core field based operational activities.

THE DISTRIBUTED COMPUTE ARCHITECTURE

Today 90% of all data is created and processed inside traditional centralized data centers or cloud. That is beginning to change. By 2025, Gartner predicts 75% of data is going to be processed at the edge.

This shift is occurring because data is growing at a massive rate and requires processing to be closest to where it is generated or collected.

Dell Technologies approach is a distributed architecture – from edge, to core, to cloud; the offers the flexibility to strike the correct balance of cost,

1st Petrotechnical Cloud appliance jointly engineered with Halliburton Landmark

1st Multi-Petabyte Scale-out NAS solution for seismic data

1st Hyper-Converged National Hydrocarbon Data Repository

1st Cloud Archive solution for sub-surface project data

Top 5 Oil & Gas ISVs validated on Dell EMC Infrastructure

92% Of Top 25 Oil Companies use Dell EMC Infrastructure

10 Critical Marine/Offshore Safety Standards passed by Dell EMC OEM Marine Solutions

Dell Technologies Energy practice serves Oil and Gas customers across the value chain, from upstream through midstream to downstream, delivering fully integrated, business-outcome, solutions that accelerate time to value to for customers in the sector.

performance, management and security for each use case; while not slowing down the ability to innovate. Dell Technologies achieves that by:

» Untethering edge from cloud so customers have choice and flexibility today and tomorrow. No lock-in to a single public cloud provider.

» Engineering an open, consistent infrastructure from edge to cloud, simplifying management and security, and offering open APIs so customers can choose the applications that best fit their environment and use case.

» Providing software-defined infrastructure for agility and efficiency/ utilization.

» Providing the most comprehensive end-to-end portfolio of hardware, software, and services.

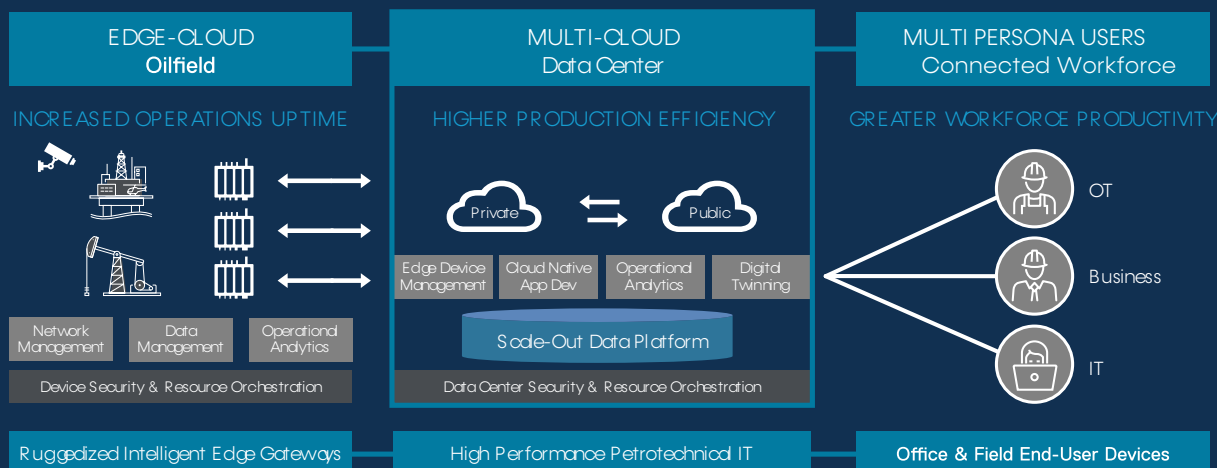### LET'S COVER THE DETAILS OF THE ARCHITECTURE, FROM FUNCTIONAL PERSPECTIVE:

1. At the Oilfield, Dell Technologies offer low footprint, containerized and secured edge data ingestion and processing that abstracts the disparity of devices, sensors or machines.

2. Essential data and insights are transmitted to the Core Data Center where it can be aggregated across plants and oilfields, enriched with other information sources – like maintenance history, operator log and consolidated in a scale-out data platform to create a more complete picture of the operations. From here, data can easily be leveraged for different applications, including Operational Analytics and Digital Twins where AI models are inferred, and where insights are integrated into business processes within enterprise maintenance management and planning applications. This can be deployed in private or public Cloud. The right Multi-Cloud Orchestration between Edge and Clouds provides the capability to Deploy AI Centrally, Refine Locally and Learn Globally.

3. All these applications will of course have some sort of User interface to enable end users from different persona to interact with systems or to simply observe operations through reporting, but the user experience must be secure, consistent and accessible at all times, regardless of whether the user is in the field or in core operations. This is the Connected Workforce capability

TO SUMMARIZE, DELL TECHNOLOGIES DELIVERS EFFECTIVE CONNECTED DIGITAL OPERATIONS THROUGH 5 KEY TECHNOLOGY AREAS:

1. Dell Technologies ruggedized, Intelligent Edge platforms: Embedded PCs, Ruggedized Servers, Hyperconverged Appliances

2. Dell Technologies Cloud-Enabled Integration Platform solutions (Boomi), Data Platforms (PowerScale scale-out data storage, and ECS Object Storage] and Converged and Hyperconverged Infrastructure. Dell Technologies also democratizes data analytics for petro-technical community by providing Ready Bundles for AI (in partnership with NVIDIA, Intel and for Hadoop).

3. Dell Technologies multi-persona End-User Devices for office, field (ruggedized where necessary), VDI platforms and AR/VR systems for remote field assistance and training

4. Dell Technologies Multi-Cloud platform (powered by VMware Cloud Foundation) provides Consistent Infrastructure – VMs and Containers, and Consistent Operations and Management to seamlessly orchestrate applications and data across edge, core and different public cloud providers. No single vendor will have all best applications.

5. Dell Technologies provide Security solutions to protect end points, network traffic and data at rest (Dell Endpoint Security, VMware NSX, Dell EMC PowerProtect Cyber Recovery), and solutions for advanced security operations (SecureWorks)

Upstream Connected Digital Operations Solution

EDGE-CLOUD Oilfield	MULTI-CLOUD Data Center	MULTI PERSONA USERS Connected Workforce
INCREASED OPERATIONS UPTIME	HIGHER PRODUCTION EFFICIENCY	GREATER WORKFORCE PRODUCTIVITY

Private · Public

Edge Device Management · Cloud Native App Dev · Operational Analytics · Digital Twinning

Scale-Out Data Platform

Network Management · Data Management · Operational Analytics

Device Security & Resource Orchestration · Data Center Security & Resource Orchestration

OT · Business · IT

Ruggedized Intelligent Edge Gateways	High Performance Petrotechnical IT	Office & Field End-User Devices

EMERSON AUTOMATION SOLUTIONS

Digital transformation is moving towards rapid adoption of emerging technologies reshaping operations in the oil and gas space. End users are using technology approaches to improve productivity, enhance efficiency, and improve profitability. It is estimated that digital transformation can save as much as $1 trillion in operational spend over a period of 5 years. Companies that are accelerating deployment have a distinct edge in a dynamic and highly competitive industry landscape. Here are a few things to consider while mapping out the Digital Transformation approach in the oil and gas operating space.

DIGITAL TRANSFORMATION ROADMAP - ASSESSMENT

The starting point of any digital transformation journey is understanding relative digital maturity, both within the organization and compared to industry peers. In fact, a crucial consideration has to be the different levels of digital maturity across different assets or workflows within the same operating company. It is important to note that it is not uncommon for various assets within the same operation to have different levels of digital adoption. Therefore, an initial assessment of digital readiness is imperative.

Technology partners such as Emerson engage with operating companies for a 360-degree assessment and benchmarking around digital maturity and create an indexing profile for end users. This profile scores maturity across key operational domains such as reliability, energy, environmental sustainability, production, safety, and security. Further, it combines operational, financial, and business data to align a comprehensive digital transformation approach with overall organizational goals such as sustainability and profitability.

Following this, specific roadmaps are developed for different domains considering infrastructure, resources, and capital availability to optimize the deployment process and investments.

Achieving horizontal and vertical scalability in terms of cost and technology integration right from Data acquisition to analytics.

As operators embark on the journey, a key area of focus is data which is the primary enabler of any digital transformation program. New data is constantly created through the asset's lifecycle, with new wells being drilled as the greenfield development progresses to maturity, producing assets. Erosion, corrosion, and flow assurance challenges resulting from declining pressures become a strong focus area as fields mature. Comprehensive well data becomes a critical requirement to drive production optimization and reduced well interventions.

As the density of measurement increases, the technological approach must minimize installation costs and ease of implementation. Emerson's portfolio of non-intrusive wireless devices makes this achievable by removing cabling and trenching activities and adding required communication agility through the Wireless HART protocol. Emerson's smart well monitoring comprises of all the measurements starting from downhole pressure and temperature, surface pressures, process temperature, volumetric flow, localized erosion, and corrosion, H2S gas detection, sand/solids detection, wellhead vibration with continuous, uninterrupted, and seamless data streaming possible with the wireless mesh network. Emerson's location awareness solution can be added to the existing network providing live location tracking to ensure personnel safety in remote and unsafe assets.

Accurate and quick decision-making depends on access to relevant data and information. Big data often comes with challenges in contextualization and its distribution. Existing data sources need to be integrated, validated, cleaned, and restored as the first step with agility and infinite scalability. The contextualized data needs to process into actionable information and distributed to the right stakeholders. The actionable information requires authentication and is often supported by data-driven platforms utilizing machine learning and AI platforms for decision support. A step ahead is to provide predictive analytics such as failure prediction, forecasting production rates that can lay the foundation for autonomous operations. Emerson's Optics Analytics platform is a single-point convergence of data integration (Data Lake), workflows, and intelligent, agnostic platforms, with enterprise-wide visualization, alarming, and relevant information distribution capabilities.

A better understanding of the upstream process and its interaction and effect on the midstream and downstream is achieved by adopting technologies such as Digital Twin. The solution can be customized to the individual, organizational processes and can accommodate changes and allow their testing in the process and infrastructure in real-time. It can radically accelerate the speed to action, improve operational clarity and resolution, and map responses on the asset performance. Emerson's Digital Twin is a virtual platform integrating control and simulation that allows organizations to test any proposed adjustments before applying these changes on the actual field or plant. The capabilities of the Digital Twin extend beyond mere testing, and simulations are identified as rapidly adopted technology in the world.

SECURITY DESIGNS AND SERVICES

With an increasingly connected oil and gas industry, more security challenges arise specifically for cybersecurity. OT remains vulnerable due to their connectivity to L4 L5 if proper firewalls and security policies are not in place. Per the several surveys carried out, it is established that cybersecurity measures are not keeping up with the speed of digitalization. Another critical challenge is the ever-evolving nature of threats, their intentions, and resulting business risk. An effective way to deal with these threats is incorporating cybersecurity in the digital transformation strategy. First, a complete data flow needs to be mapped across the various assets, processing areas, control stations, and headquarters followed by security gaps assessment as a continuous process and develop networks that can withstand and deflect the attacks to the process safety. The selection of proper sensors complying with the industry cybersecurity policies is crucial. Assigning security goals to all the stakeholders involved and educating them on the best practices and security operations must happen continuously. Emerson offers cybersecurity services, including training, consultancy, and network designs, by eliminating the access and ways of unnecessary interactions, introducing isolations in networks for critical operations, revisiting the logics, and enhancing their security, devising effective alarm management strategies, and utilizing engineered solutions.

EMERSON AS A TECHNOLOGY PARTNER

A successful Digital Transformation journey adopts the various cutting-edge technologies most befitting the current organizational readiness and the long-term goals with compliance to industrial security and cybersecurity standards. Since each organization will have a unique path, the potential technologies, including the devices, communication infrastructure, integration, and analytics platforms, should be scalable, agile, and vendor agnostic. Emerson offers a complete ecosystem (The Plantweb Digital Ecosystem) of the mentioned technologies coupled with the consultancy and training services that pledges the commitment as a technology partner in the ever-evolving journey of Digital Transformation.

ExplorePlan

accelerated exploration planning solution

Schlumberger

For streamlining and derisking exploration opportunities

### Applications
- Opportunity assessments

Key benefits
- Create project objectives and timelines and assign team members
- Clearly display and rank worldwide portfolio and assets
- Align multidisciplinary teams
- Enable full auditability and repeatability

How it improves opportunity assessments

The cloud-based ExplorePlan* accelerated exploration planning solution streamlines exploration strategies to improve efficiency and reduce uncertainty. It connects business objectives with data and technical workflows to enable you to compare and rank exploration opportunities at any level and stage. By providing easy access to all relevant data—both structured and unstructured—ExplorePlan solution bridges the gap across technical teams, offering a collaborative workspace for faster and better decision making.

Frame and execute exploration projects

To kick-start an exploration screening project, the ExplorePlan solution enables you to assign a team, define activities and tasks, request peer review, link corporate or historical knowledge, and capture all technical outcomes for faster decision making and project closure.
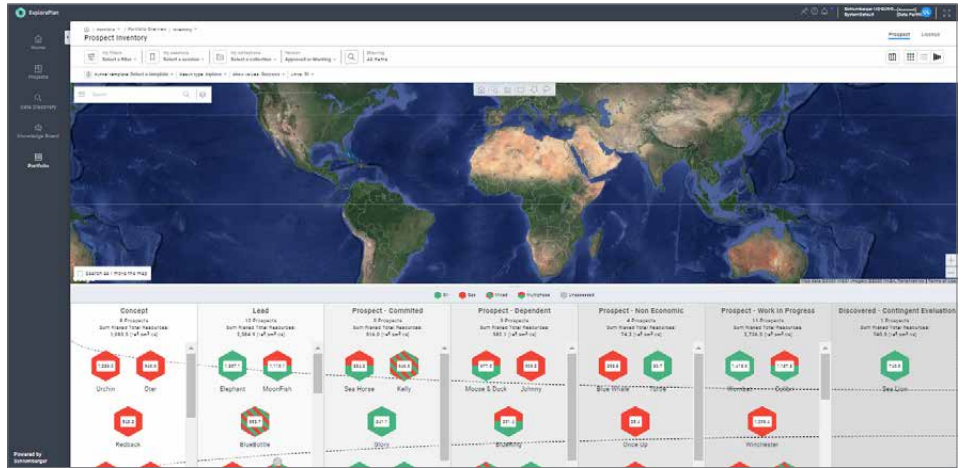
ExplorePlan solution streamlines your opportunity assessments so you can compare and rank prospects with greater efficiency and cross-domain intelligence and collaboration.

Access knowledge base to improve your interpretations

The ExplorePlan solution displays all corporate and historical knowledge—such as the general petroleum system, geology, stratigraphy, and structure—about a basin or region in a knowledge board to help you better understand and assess opportunities. You can leverage the existing knowledge base, create new data, link knowledge to technical workflows in Petrel* Petrotechnical Suite, and share new insights across the team. The knowledge board also enables you to deep link to Petrel E&P software platform projects in the DELFI* cognitive E&P environment's data ecosystem, making it easier to track a project.

Discover all relevant E&P data

Further investigate areas of interest on a global map where you can discover all E&P data—from corporate, public, and vendor information to seismic and wells data, interpretations, and models to reports and publications. You can also compile and further curate data in the knowledge board.

Compare and streamline exploration portfolios

With ExplorePlan solution, you can compare exploration opportunities—ranked by KPIs such as recoverable resources, risk, and NPV. And it enables you to link directly to corporate and asset portfolios of assessed exploration opportunities in the GeoX* exploration risk, resource, and value assessment software, as well as the Petrel Petrotechnical Suite, to update opportunity assessments. The solution also incorporates analytics powered by TIBCO Spotfire® so you can create custom dashboards for portfolio reporting, assessment performance tracking, and analog data statistics.

What is the DELFI cognitive E&P environment?

The secure, scalable, and open cloud-based DELFI environment provides seamless access to software across exploration, development, drilling, production, and midstream applications—all delivered via a flexible and personalized SaaS subscription model. Combined with domain expertise, digital technologies in the DELFI environment help solve challenges across the E&P life cycle.

slb.com/ExplorePlan

Experts you can trust in your digital transformation journey

Between a storied past and a smart future

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there's a bridge.

The Port of Rotterdam is one of Europe's most established ports. And with 467 million tons of cargo moving through its docks every year, it's also the largest. Ensuring the safety of billions of dollars of goods is no small task, which is why they asked Cisco to network the entire port – generating and protecting terabits of data they use to make every aspect of their operation run smoothly, predictively, and securely.

If you can imagine it, we will build the bridge to get you there.

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CISCO ™   The bridge to possible

OPTIMIZE YOUR WELL CONSTRUCTION PERFORMANCE
WITH THE NEXT GENERATION OF DIGITAL TECHNOLOGY

EXPERTS:

» Nishant Raizada, Solution Owner for Real Time Well Engineering, Edge, and Well Activity Program

» Kenneth Lobo, Product Owner for Real Time Well Engineering

Monitoring multiple live rigs using multiple applications with data coming from multiple sources is an inherently complex and time-consuming process. This is compounded by the lack of vendor neutral real-time applications. Any mistakes made during this process can result in costly non-productive time

Oil and gas drilling is in the midst of an important transition, moving from manual to automated well operations management. It's a big shift, but a necessary one if we are to make effective operational decisions and drill successfully. It sounds like a daunting prospect, but it doesn't have to be.

KEEPING ON TOP OF REAL-TIME OPERATIONS

Real-Time Well Engineering, a DecisionSpace® 365 cloud application, allows you to monitor multiple wells simultaneously in real time, using fewer resources, for safe, efficient, and cost-effective operational performance.

Built from the ground-up using ground-breaking computation, this smart system automatically detects rig state and seamlessly couples engineering and system uncertainty models in real-time closed looped systems. It also facilitates the automation of broader E&P workflows, and effective operational decisions, which can improve drilling efficiency and performance of downhole tools to reduce well costs.

ACT IN THE MOMENT

Automated, digital technologies empower faster and more effective decision making to help mitigate drilling risks and improve performance. Real-Time Well Engineering can help increase your drilling performance by up to 25 percent by automatically processing and analyzing rig state activities and associated drilling data to help minimize ILT.

With the ability to run up to 10,000 calculations a day, without the need for human interventions, Real-Time Well Engineering can re-compute drilling parameters using automatically updated models at a rate that would not be humanly possible using traditional methods. This is achieved with advanced modeling techniques using deep data computational physics/algorithms to help reduce the time and effort to perform advanced drilling analytics to gauge the level of uncertainty. What once would have taken days can now be accomplished in minutes.

This dynamic data can be quickly and easily accessed and consumed via single intelligent master dashboards that help improve data interpretation.
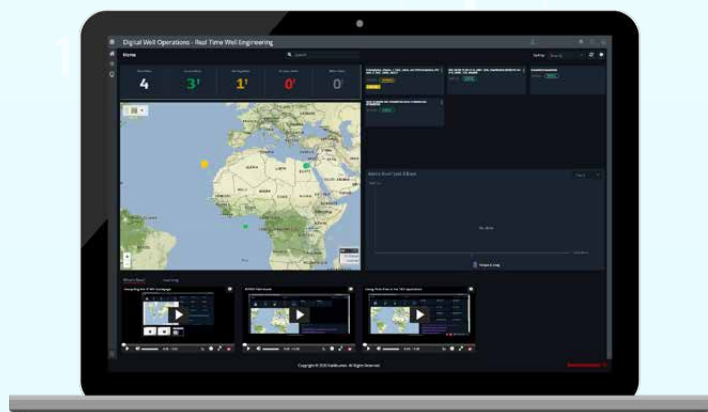

Figure 1. The Real-Time Well Engineering Dashboard

HALLIBURTON

STAY ONE STEP AHEAD

Continuous, real-time monitoring of drilling data can enable early recognition of anomalies or deviations from plan and applies analytics to re-compute and re-calibrate drilling parameters. Real-Time Well Engineering can help you stay one step ahead and reduce uncertainty and enhance prediction accuracy by leveraging machine learning and AI to help mitigate operational risk for smarter drilling outcomes.

Deep data, physics-driven analytics feed various engineering models to train machine learning (ML) models and inform you of current uncertainty via microservices technology in the cloud. The Torque and Drag and Anti-collision models allow you to compare trends in planned well details and continuously monitor well positions.
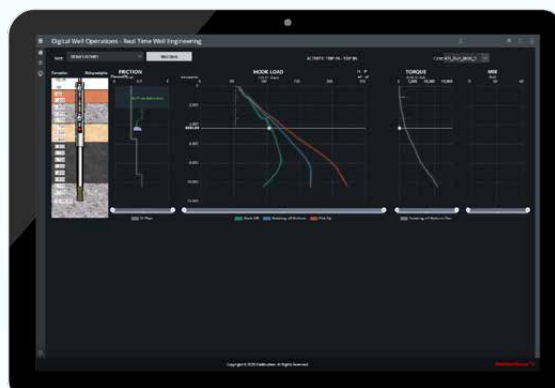

Figure 2. Torque and Drag Model

CHOICE & FLEXIBILITY

The open architecture on which Real-Time Well Engineering is built enables choice and flexibility by facilitating the easy integration of other DecisionSpace 365 applications such as Digital Well Program®, another DecisionSpace 365 cloud application, as well as other 3rd party software. This ease of connection means that you can fully leverage your existing assets to analyze drilling efficiency and dynamically update your well program and operations.

INCREASE YOUR OPERATIONAL PERFORMANCE

As an operator, you're committed to drilling a well program safely and on time – but today, you must do this at significantly lower cost and with fewer resources. And, to mitigate risk and keep well costs down, it's essential that well operations proceed with maximum efficiency.

The convergence of real-time drilling analytics, such as big data and cloud computing, and other digital technologies is helping make it possible to tune rig processes for optimal performance and longer producing life.

Real-Time Well Engineering, a key component in Halliburton Landmark's Digital Well Operations DecisionSpace 365 solution, can help increase your operational performance by automating and optimizing your well operations, and help reduce operational uncertainty so you can focus your time on informed decision making.

Email us at landmark-mena@halliburton.com
or contact us for a demo.
https://www.landmark.solutions/Contact-Us)

People + Technology

Working Together for Smart, Responsible Energy Production

The Apache Egypt team has history of introducing new tools and techniques to explore for oil and gas. A key component of our success has been the ability to acquire and evaluate 3-D seismic surveys that enable our technical teams to consistently high-grade existing prospects and identify new targets across multiple pay horizons. With better subsurface pictures over 3 million acres, we have achieved a drilling success rate of 93% and look forward to continuing that strong track record.

We are excited about the possibilities ahead through the Ministry of Petroleum and Mineral Resources' modernization program and the development of the digital oilfield. Together, with Egypt's talented workforce, these efforts will help responsibly maximize the country's energy resources, enhance Egypt's role as a regional hub for energy production and trading, and ensure that Egypt remains an attractive investment destination for companies around the world.

Apache

WHAT HUAWEI'S TECHNOLOGIES CAN OFFER THE OIL & GAS INDUSTRY

AN INTERVIEW WITH HUAWEI EGYPT CEO **VINCENT SUN**

PLEASE CAN YOU GIVE US A BRIEF INTRODUCTION ABOUT HUAWEI?

Founded in 1987, Huawei has more than 190,000 employees, among which more than 90,000 are R&D employees. We operate in more than 170 countries and regions. We have gained considerable recognition for our continuous progress. In 2021, we were ranked no. 44 in the Fortune Global 500.

Huawei is a leading global provider of information and communications technology (ICT) infrastructure, and smart devices. We are committed to bringing digital technologies to every person, home, and organization for a fully connected, intelligent world. In the fields of communications networks, IT, smart devices, and cloud services, we provide customers with a competitive, secure, and reliable end-to-end portfolio of products, solutions, and services. Through open collaboration with ecosystem partners, we create lasting value for our customers, working to empower people, enrich home life, and inspire innovation in organizations of all shapes and sizes.

WHAT SOLUTIONS FROM HUAWEI ARE HELPING TRANSFORM THE OIL AND GAS INDUSTRY?

Our digital strategy can greatly boost oil and gas development, specifically, it can help unlock more promising values, such as predictive maintenance, remote operations centers, dynamic energy selection mode, omni-channel retailing, and connected service fields. It can also improve the social values of the oil and gas industry — values including saving money, higher productivity, lower water resource consumption, and smaller carbon dioxide emissions.

Huawei has proposed "Leading New ICT for Higher Safety and Efficiency in the Oil and Gas Industry" and cooperates with industry partners to launch ICT solutions covering the upstream, midstream, and downstream sectors to combine digital production with safety control and improve productivity.

These innovative ICT solutions include oil and gas IoT, digital pipeline, HPC & operations management, and smart distribution. Huawei's oil and gas solutions have been applied in 45 countries and regions around the world, serving 70 percent of the global top 20 oil and gas companies

WHAT KIND OF INNOVATIONS CAN HUAWEI BRING TO THE OIL AND GAS INDUSTRY IN EGYPT?

Huawei's mission for the oil and gas industry in Egypt is to contribute in empowering OT and IT digitalization for oil and gas cycle in Egypt.

One of the innovations is that an enterprise cloud-based solution can manage and coordinate multiple data centers for oil and gas companies in Egypt. As a result, this will directly impact overall operational efficiency and eliminate resources wasting in the exploration process.

In the midstream process, pipelines are typically deployed across long distances, traversing complex geographies. Traditionally, manual inspection — which is both costly and inefficient — is required to detect and control security risks. Yet, a lack of visualized oversight or unified tools makes remote site management and the coordinated management of multi-vendor devices impossible. However, Huawei's future-facing Pipeline Monitoring and Warning can provide midstream companies in Egypt with a secure, reliable, and uninterrupted pipeline communications system.

The system is made up of three key components: a backbone transmission system; an integrated solution for remote site power supply, communication, and Internet of Things (IoT) edge-device intelligence; and a machine vision security monitoring system.

Ending up with the downstream process; gas stations, as the outlet through which refined oil is sold to end users, are numerous and widely distributed. As a result, oil companies require various communication methods, such as voice, data, and video, to monitor and control efficient daily operation and management. Huawei's high-performance routers implement unified access and management of High-Definition (HD) IP cameras, fixed-line phones, and service support systems. The solution covers oil product management, retail, surveillance, Office Automation (OA), and other daily services, unifying transmission of services and facilitating Operation and Maintenance (O&M).

WHAT'S HUAWEI'S UNDERSTANDING IN REALIZING DIGITAL TRANSFORMATION IN OIL AND GAS INDUSTRY?

Digital transformation is inevitable if the industry is to address these challenges efficiently and sustainably. Realizing that such a change brings significant opportunities to oil and gas companies, digital transformation can drive the reconstruction of business and management models and can facilitate the innovation of new models entirely. Ultimately, digitization can help oil and gas companies evolve and increase value.

The digital and intelligent development of the global oil and gas industry is still in its infancy. The key fields being explored in the industry include smart exploration, smart oil and gas fields, smart pipe networks, smart refining and chemicals, and smart sales. The oil and gas industry needs to further integrate digital technologies and fully realize its digital transformation goals to boost reserves and production, improve quality and efficiency, and reduce carbon emissions. The industry has several requirements to enable this transition. Transformation necessitates a full-stack cloud platform, which can help energy companies migrate key business processes to the cloud and gain intelligence.

Effective data governance is also needed. Data generated by the industry is high in volume and complexity. Therefore, a unified data lake is indispensable to support data sharing and smart Big Data analysis.

Furthermore, digital transformation requires a device-edge-cloud intelligent production system, where production data is collected from devices, and intelligent management and control of production is implemented on the cloud.

Finally, strong service assurance is essential to achieve digital transformation. It is paramount to have a professional service team that understands both the industry and digitalization to realize these objectives.
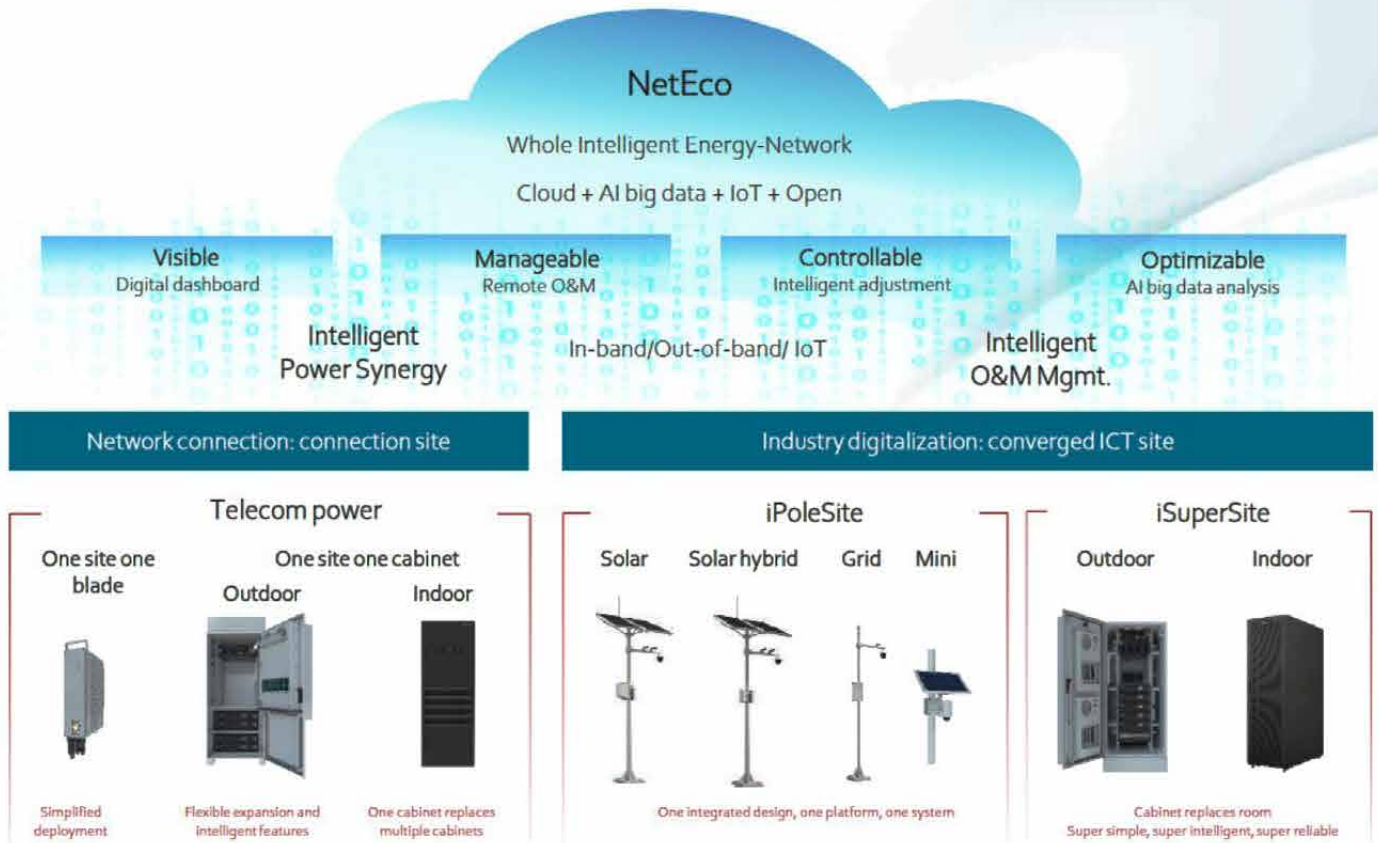
AS WE KNOW THAT ADIPEC 2021 WILL BE HELD IN ABU DHABI IN NOVEMBER THIS YEAR, DOES HUAWEI HAS ANY PLAN DURING THE EVENT?

Yes, Huawei will host the Global Oil & Gas summit at ADIPEC 2021, under the theme of "Drive Data to Barrel, Embrace Intelligence to Grow", where we will share the best practices for global leadership in digital transformation.

Huawei will demonstrate how we plan to support oil and gas companies' digital transformation strategies and integrate digital technologies into core oil and gas business processes. In detail, Huawei will share the ins and outs of migrating oil and gas to the cloud, AI in E&P, computing power increase reserves and production solutions, digital and intelligent oil & gas fields, and more.

To learn more about Huawei's solutions for the oil and gas industry, please join us in Huawei's Global Oil & Gas summit at Abu Dhabi International Petroleum Exhibition & Conference 2021 from 15 to 18 November. Huawei will also showcase some of the most significant powerful emerging technologies in the oil & gas industry, sharing innovative new ideas and ways to use digital technologies reimagine energy systems in No. 3220 Huawei booth, Hall 3, ADNEC.

Huawei Industry Site Power Facility Product Portfolio

NetEco

Whole Intelligent Energy-Network

Cloud + AI big data + IoT + Open

Visible	Manageable	Controllable	Optimizable
Digital dashboard	Remote O&M	Intelligent adjustment	AI big data analysis

Intelligent Power Synergy

In-band/Out-of-band/ IoT

Intelligent O&M Mgmt.

Network connection: connection site

Industry digitalization: converged ICT site

Telecom power

One site one blade

One site one cabinet

Outdoor · Indoor

Simplified deployment

Flexible expansion and Intelligent features

One cabinet replaces multiple cabinets

iPoleSite

Solar · Solar hybrid · Grid · Mini

One integrated design, one platform, one system

iSuperSite

Outdoor · Indoor

Cabinet replaces room
Super simple, super intelligent, super reliable

APPLICATION SCENARIO:
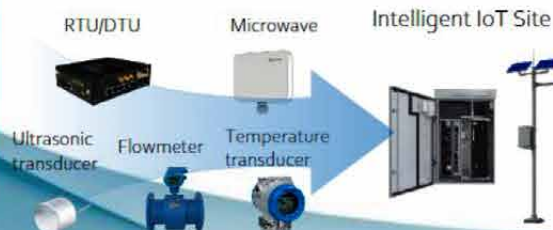## OIL AND GAS PIPELINE MONITORING

Service Scenario

- Pipe traffic monitoring
- Pipe defect detection
- BVS/security monitoring

Service Requirements

- Remote site, difficult mains introduction and onsite visit
- Various devices, such as microwave, routers, RTUs, flow meters, and ultrasonic sensors
- Multi-mode power supply, such as 12/24/48 V DC and 220 V AC

Solution

RTU/DTU · Microwave · Intelligent IoT Site

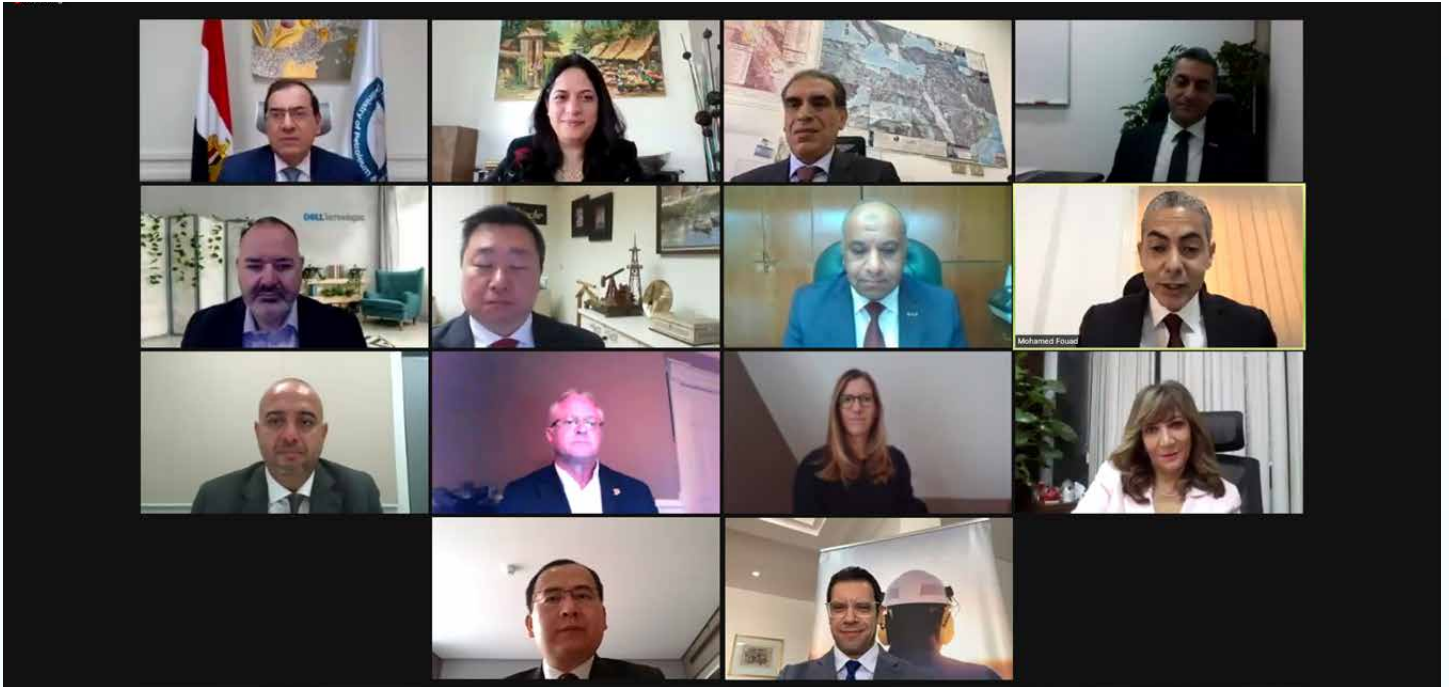Ultrasonic transducer · Flowmeter · Temperature transducer

Benefits

Simple, Intelligent, Reliable

- Solar access, mains introduction free
- Unified power platform, AC and DC all in one
- Intelligent O&M, eliminating frequent site visits

DIGITALIZATION IN THE OIL & GAS INDUSTRY:
ENHANCING EGYPT'S PETROLEUM FUTURE

BY SARAH SAMIR

Egypt Oil & Gas was honored to host the 'Digitalization in Oil and Gas' Webinar on October 10th under the patronage of H.E Tarek El Molla, Minister of Petroleum and Mineral Resources.

The webinar brought together many esteemed guests who tapped the tremendous digital transformation efforts and the ministry of petroleum (MOP)'s progressive digitalization vision. "In 2016, [MOP] dedicated a whole program in [its] Modernization strategy for digitalizing the Oil and Gas sector in order to be more efficient, achieve optimal performance and full monitoring and control over the whole value chain to take well informed decisions," El Molla stated in his opening speech. The digital transformation of the oil and gas sector had more than 70 initiated projects, according to the speech.

The sector has walked an impressive path in its digital transformation and it is still exerting efforts to bear the fruits of development. "Over the last few years, the spirit of partnership, the vision, the leadership, in terms of making a step change in the sector has been phenomenal," according to Karim Badawi, Director - Enterprise Digital Performance at Schlumberger.

DIGITAL TRANSFORMATION: A SUCCESS STORY

Digitalization had been a distant goal in the past, however, it became quite feasible and necessary. "Digitalization is not just a trend, but an essential part of how the E&P sector must operate," Sameh Sabry, EOG Committee Chairman, Senior Vice President and Managing Director Egypt at Wintershall Dea, noted.

Today, "companies are seeing digital transformation as an opportunity to develop their own intellectual property, if you like to materialize their own ideas and differentiation in software," David Holmes, General Manager – Energy at Dell Technologies, pointed out.

The Egyptian oil and gas sector has been operating for a long time, and hence it has a lot of data that could be hectic if unorganized, yet it would be very profitable when it is well-structured.

> *[EUG] is a world-class national E&P data repository that preserves legacy data, manages the active data and promotes investment opportunities through international bid rounds to accelerate E&P activities.*
>
> **H.E. Tarek El Molla**
> *Minister of Petroleum and Mineral Resources*

> *Having EUG in place, the Egyptian Oil & Gas sector established a role model for upstream business.*

Ashraf Farag
First Undersecretary for Agreements and Exploration, Ministry of Petroleum and Mineral Resources.

> *Program seven has many objectives, one of them is to link EGPC and the holding companies and their affiliated companies under a unified network.*

Ashraf Bahaa
Chairman and Managing Director at the Egyptian Mintenance Company (EMC)

> *We tried to get what is exactly installed and we have in our sector, and then verifying the gaps between what we want to reach or the target model that we are dreaming to reach and between the actual status in the sector.*

Osama Salem
Business Development General Manager at ENPPI

The need of a well-structured system inspired the sector to use digital tools and establish magnanimous digital platforms like the Egypt Upstream Gateway (EUG). Digitalizing the sector is going to bestow great benefits on the petroleum industry since it was initiated. There are "many potential benefits in digitizing the oil and gas industry," David Chi, Region Vice President and General Manager Apache, stated, adding that "it can lead to more efficient decision making and operations, which will result in lower cost per barrel and higher return on investment, it can also help to ensure safer operations & better environmental awareness."

Ashraf Farag, First Undersecretary for Agreements and Exploration, Ministry of Petroleum and Mineral Resources, agreed, saying that the "EUG will have an impactful role on attracting new upstream investments." Moreover, "having EUG in place, the Egyptian Oil & Gas sector established a role model for upstream business," Farag pointed out.

Digitalization has become a must to de-risk the oil and gas activities and decrease downtime. "Digital transformation is really a competitive advantage that we need for the petroleum sector, not just to try to change the culture to more digital and empower a remote working environment. That goes without saying, and we have been living this during the COVID era so far very successfully in Egypt. But digital transformation is also there to improve performance, increase productivity, reduce downtime, use real-time data for production improvements and enhancement, to reduce downtime in drilling, and to improve targeting there as well as asset-integrity, predictability for preventive maintenance, to maintain the integrity of our assets and infrastructure and facilities," Sabry explained.

Commenting on the success of the digital transformation program so far, Hoda Mansour, EMEA South Head of Business Process Intelligence (BPI) at SAP, said that "the vision and the resilience we witnessed in Egypt running the Modernization Program at the Ministry of Petroleum during the year of COVID, I would say that it was second to none."

"There is a lot to be done in Egypt when it comes to Business Process Intelligence, there will be massive need to improve efficiencies, provide continuous improvement mechanisms and benchmarking to industry best practices; to compare where we are today versus

other industry leaders in other companies in affiliated sectors," Mansour noted.

Taking steps in the Modernization project's 7th pillar, the digital transformation program, such as establishing the EUG, which was described by El Molla as "a giant step in digitalization of upstream business," has helped Egypt safely go through a tough year caused by the Corona Virus Pandemic.

THE EUG: CONNECTING PLAYERS

The EUG is a prominent asset in the oil and gas digitalization program. It "is a world-class national E&P data repository that preserves legacy data, manages the active data and promotes investment opportunities through international bid rounds to accelerate E&P activities," according to El Molla.

Prominent oil and gas leaders appreciate the role of the EUG in developing the Egyptian oil and gas sector and preserving its data. "Having accomplished a massive large amount of data herd, petabytes and petabytes of data is no mean feat, and is actually the foundation upon which we build our digital transformation programs," Hans-Christian Freitag, Vice President, Intelligent Software Solutions at Baker Hughes, said.

The Egyptian gateway will support the upstream business and accelerate exploration, as it will help in driving the value from data through regional geographical and geophysical (G&G) studies supporting the ministry's digital transformation vision.

The EUG now has full potential and security measures to protect data through its

> *ERR team is one of the main pillars of Program 7, the pillar support in ERP system implementation and maximize the benefits of the existing one to be able to achieve MOP vision.*

Dawlat Hashem
Assistant Chairman for Communication and Information Technology at the Egyptian Natural Gas Holding Company (EGAS)

disaster recovery center. Moreover, the gateway development does not stop here as it still has many goals to achieve.

DIGITALIZATION FOR INTEGRATION, SUPPORT

The digital transformation of the oil and gas sector further aims to bring together the petroleum players under one umbrella. "Program seven has many objectives, one of them is to link EGPC and the holding companies and their affiliated companies under a unified network , which mandates upgrading and integrating the existing operational technology systems with the information technologies across the entire oil, gas and Petrochemical sector operations, while assuring information security and confidentiality throughout the digital transformation process," Ashraf Bahaa, Chairman and Managing Director at the Egyptian Mintenance Company (EMC), said.

The digital transformation of the oil and gas sector in Egypt is following certain guidelines that are "prepared for this program to ensure the required degree of integration," according to Bahaa.

Meanwhile, Osama Salem, Business Development General Manager at ENPPI, explained the process of starting the digital transformation program, stating that teams of experts sat together to set the program's goals. These teams "shared the goals with the IOCs and technology provider as well as companies all over the sector, the upstream; the mid-stream; and the downstream, to guarantee the value chain, and then the next step we tried to get what is exactly installed and we have in our sector, and then verifying the gaps between what we want to reach or the target model that we are dreaming to reach and between the actual status in the sector. Then, from that gap, we will plan for several digital transformation projects that will be running in parallel."

To ensure the integration across the sector and to support its digital transformation, the digitalization program has several pillars including the enterprise resource planning (ERP). The "ERR team is one of the main pillars of Program 7, the pillar support in ERP system implementation and maximize the benefits of the existing one to be able to achieve MOP vision to reach a real time integration between all holding companies and their affiliate companies and MOP," according to Dawlat Hashem, Assistant Chairman for Communication and Information Technology at the Egyptian Natural Gas Holding Company (EGAS).

To achieve the goals from the ERP systems, it is crucial to ensure alignment between business strategies and IT. Hashem explained that "successful ERP implementation requires: alignment between business and IT, executive sponsorship and support, trusted external partner (consulting and software vendor), internal qualified team, change management, as well as training and capacity building."

INNOVATION FOR A DIGITAL SECTOR

The webinar went on giving the voice for digital solutions providers talking about supporting the oil and gas sector's digitalization.

Many technology vendors have been supporting energy industries across the world in their digitalization efforts. For example, "Huawei serves more than 20 top oil and gas companies, such as Gazprom, ADNOC, Aramco, etc. We have rich experience in the oil and gas industry. What's more, we are assisting customers in digital transformation during current global pandemic. Take CNPC Daqing as an example," Robin Lu, Vice President of Huawei Global Energy Group, said.

"The existing reservoir exploration information system in Daqing is outdated and has low computing performance," Lu explained, adding that "In this project, nearly 700 sets network devices were deployed, and a 400G high-speed cloud data center core network was built, improving the computing efficiency by 833% with 1,000 trillion times per second computing capability."

Using advanced technologies in the oil and gas sector needs the cooperation of digital solution providers whose technology match with MOP's digital transformation vision. "Technology can help in many ways, and based on what H.E [El Molla] said, it is actually matching what Cisco is doing in terms of strategy as well," according to Ayman Elgohary, General Manager & Regional Director Cisco – Egypt, North Africa & Levant (NAL).

Elgohary explained that leadership and knowledge transfer "can help the oil and gas sector advance in this area [sustainability], and also can help other sectors as well."

Meanwhile, Wintershall Dea introduced the exploration Advisory Tool, which

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Vice President, Intelligent Software Solutions at Baker Hughes

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Sameh Sabry
EOG Committee Chairman, Senior Vice President and Managing Director Egypt at Wintershall Dea.

> ❝ *The Exploration Advisory Tool is the cognitive search engine for unstructured data that we have developed in cooperation with IBM.* ❞

Kathrin Dufour
Senior Vice President Digitalization & Technology at Wintershall Dea

> ❝ *Technology can help in many ways, and based on what H.E [El Molla] said, it is actually matching what Cisco is doing in terms of strategy as well.* ❞

Ayman Elgohary
General Manager & Regional Director Cisco – Egypt, North Africa & Levant (NAL)

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David Holmes
General Manager – Energy at Dell Technologies

is "a great example of how artificial intelligence can support our people in decision making. The Exploration Advisory Tool is the cognitive search engine for unstructured data that we have developed in cooperation with IBM," Kathrin Dufour, Senior Vice President Digitalization & Technology at Wintershall Dea, stated.

The webinar also discussed the digital future from the point of view of the technology vendors. "The key to the digital transformation lies in the convergence of ICT technologies and industries. Innovations such as Big Data, IoT, cloud computing, AI, and 5G support the digital transformation. Just like P7 targets of MoP Modernization Project," Lu noted.

When it comes to the security of data, technology, clouding, and artificial intelligence can help preserve data pack-up and ensure the safety of digital process. The oil and gas sector "needs to have a cyber-security strategy in place or otherwise, you won't be able to operate the whole thing," Elgohary explained.

DIGITAL-ORIENTED CAPABILITIES

The culture shared among the oil and gas sector talents is a major goal when it comes to digital transformation. "One of our main objectives is nourishing a digitally oriented culture and the sustainability of the digital transformation process of the sector companies," El Molla stated, adding that "digital transformation isn't just transforming processes into the digital world; it's about having a culture that adapts to such kind of change."

Holmes agreed, saying that "digital transformation is a cultural transformation. It has to go throughout organizations, and it is something that every team member has to be part of whether in terms of contributing to or embracing the transformation."

Having a digital-oriented culture is not only a goal of digitalization, but it is also necessary to achieve the objective of digital transformation. "It is very important to stress and highlight on human capital objective, it is necessary to build a knowledge transfer culture," Bahaa noted. "This culture can be achieved by establishing dedicated in-company digital Transformation teams that will lead the change management process and carry on all the efforts on

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EMEA South Head of Business Process Intelligence (BPI) at SAP

digital transformation in their companies in the oil and gas sector," he added.
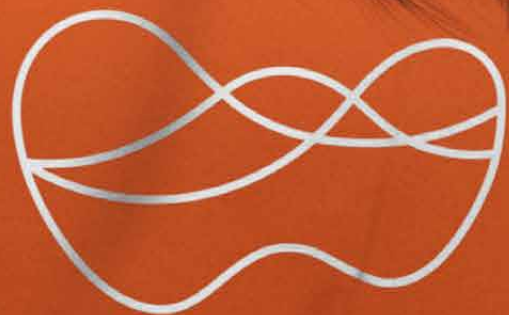
The digital transformation of the oil and gas sector "can enable capacity building for the workforce of the future, promote a more innovative mindset and culture, and in creating a more attractive investment environment," Chi explained.

Digital transformation and recent technology are crucial for the petroleum industry. It is not only about technology, but it is about people, culture, and mindset, in digitalizing the oil and gas sector. Covering many highlights and insights of the oil and gas sector digital transformation, the webinar closed with hopes to meet again in such an informative webinar.

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PIONEERS AT HEART.

Wintershall Dea embraces diversity
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Companies that are inclusive of
people with different backgrounds,
perspectives and approaches tend
to outperform their competitors.
We seek to recruit people with
both technical and non-technical
experience who can add value to
Wintershall Dea, regardless of
their nationality, ethnicity, gender,
sexuality, age, disability or beliefs.

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