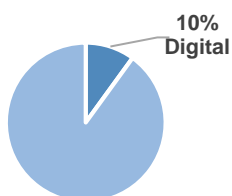




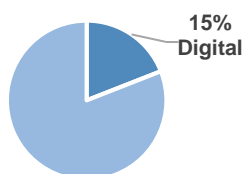
Research & Knowledge Management department of Samruk-Kazyna JSC presents
Future Energy is Here - Digitalization in Oil & Gas industry

July 3, 2017, Astana, Digital technology has a major part to play in the next stage of structural cost reduction. In expectation of more modest oil prices than in the past, improving the level of digitalization is one of the ways that the oil and gas industry can stay competitive. Today, only 3-5% of oil and gas equipment is integrated and less than 1% of data is utilized to make decisions, leaving companies with significant potential to optimize assets and operations. Out of 93mln bpd of oil output, only 9-18mln bpd come from oil fields that are digitally enabled. Top national oil companies, which are responsible for 40% of world oil output, produce only 15% of output using digital technology.

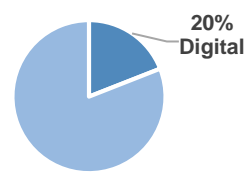
Rest of NOCs and independents (40% of output)



Top NOCs 16 companies (40% output)



IOCs 9 companies (20% output)



** NOCs – national oil companies, IOCs – international oil companies*

Source: Ernst & Young “How ready are your assets to perform in the digital world?”

Digital technology creates value within the oil and gas context by enabling better and faster operational decisions, leading to greater asset utilization, reduced operating costs and increasing efficiency. It can simplify and synchronize processes and accelerate integrated decision-making. Smarter decisions lead to faster incident correction and prevention, as well as greater insight into operations and collaboration.

The oil and gas industry is expected to generate USD1.1trln in digital value at stake from 2015-2024. The global smart oilfield market is expected to grow at a CAGR of more than 4% by 2020. Smart oilfield services are forecasted to increase the NPV of an oilfield by 25% by reducing exploration and production costs and shortening schedules, increasing productivity, and reducing downtime.

Oil and gas companies in Kazakhstan lag behind its Russian peers in terms of the level of digitalization. As of January 2015, the number of smart fields globally has reached 240, while 27 of them were in Russia. Total investments in digitalization of oil & gas industry in Russia may reach USD0.5-2.0bln annually during the next 5-15 years.

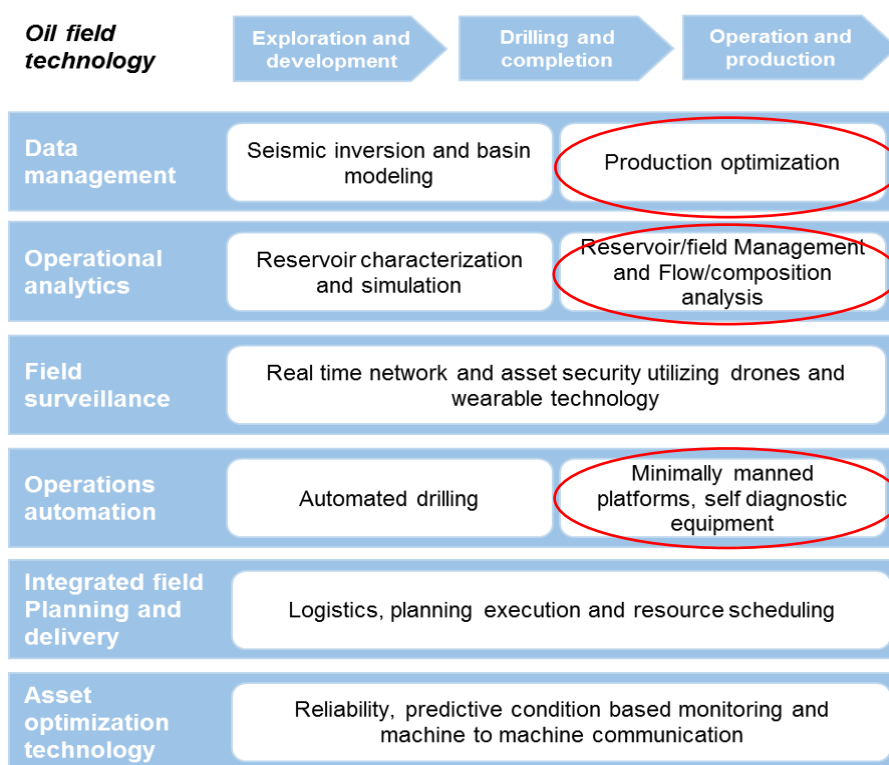
Technical readiness of Kazakh oil & gas companies to introduce digital technologies is high. The implementation of such projects requires substantial investments, and thus a revision of investment programs, which were recently cut down due to low oil prices. The key obstacles to allocating funds on digital projects are uncertainties associated with achieving positive effects. We recommend to start by

deploying digital in areas where the technology can affect the cost curve in the short term and deliver immediate results.

Kazakh oil & gas companies are now adopting technology of smart fields, optimizing logistics processes and equipment maintenance at their some oil fields. The implementation of “smart field” allows to promptly identify the location of oil leak, to improve the quality of identifying the reasons of oil leakage, to control production equipment, to boost the effectiveness of producing and injection well stock, and to reduce operating expenses and costs. According to the preliminary forecast, the smart field project could lead to an increase of production at field by about 3% and active well utilization rate, to a reduction of the time required to repair wells by 15-20% and the electricity consumption by about 30%.

There are still challenges in introducing digital technologies in Kazakhstan especially in the areas of qualified human resources. This can be resolved by forming corporate (governmental) competency building and development system on integrated modelling and integrated operations.

Six areas of digitalization exist for significant value creation in upstream operations



Source: PwC

Areas encircled in red are those areas where Kazakh oil & gas companies can invest.

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