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## A new R&D collaborative paradigm; a more artful model

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Oil and gas companies have been facing major challenges to adapt to the dramatic decline in oil prices and the need to drastically cut costs and mitigate risk. R&D has been sought to develop the required technologies for solving both current and future challenges in the petroleum industry. Oil and gas competition for exploration continues to drive the need for new technology to lower operating costs and increase finding and recovery rates. R&D in industry has been primarily driven by technology development and marketing while the academia research may have different objectives. Over the last two decades university-industry collaboration has grown considerably. Oil and gas Operators are motivated to invest in R&D to improve their operations in different aspects. Service companies want to increase their market share by developing technologies through R&D. They also invest in technology to develop patents, later turned into products or licensing possibilities that will return a stream of revenue for years.

The competitiveness and innovation of the petroleum industry has contributed positively to operation efficiency and excellence. R&D collaboration has been a platform that enables close alignment to allow knowledge exchange and coordination to take place, reduces the risks of inconsistencies across value chain steps, improves efficiency by elimination of duplicative efforts, and decreases chances of misunderstanding. Institutional R&D collaboration provides incentives and opportunities to augment the R&D

collaboration portfolio with other partner types because the novel, generic knowledge and new technologies generated can be exploited in more applied R&D collaborative projects with other partner types. In addition, building up R&D alliance capabilities requires recognition of the distinct differences in collaboration processes depending on the partner type. The challenge remains as to integrate performance analysis and the analysis of the drivers of R&D collaboration within a single framework and system of equations and evaluate opportunities to better assess R&D collaboration paths to provide more tangibles. Future R&D collaboration should consider the dynamics of the growth in firms' heterogeneous R&D collaboration portfolios, with the performance consequences of alignment and chronological patterns forming a promising avenue for further realization.

This paper reviews the current research collaboration models in the E&P industry and its limitations. Additionally, it proposes a new research collaboration model to establish a research platform on which different parties of interest meet. This is basically to ensure that all R&D are aligned with business needs and to get the utmost of the research work from promoting the national research and developing researchers and to have oriented outcomes that satisfy the interest of national R&D and service providers.

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