The Contribute of Digital Technologies for the Oil and Gas Industry

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1. Theme Description

The IEA estimated, in the"*Medium-Term Oil Market Report 2016*", that oil demand will increase from 94.4Mbbl/day in 2015 up to 101.6 Mbbl/day in 2021 with a mean annual growth of 1.2% dragged by Asia and Middle East.[1]However, in last ten years the cost of productions have increased by about 60%, while oil prices fell down.[2] For example, referring to OPEC oil prices decreased from 109.45 US$/bbl in 2012 to 40.68 US$/bblin 2016.[3] In this scenario digital technologies can have a pivotal role in reducing costs and risks, increase production and efficient of operations. McKinsey&Company, indeed, argued that digital technologies could reduce capital expenditures of about 20%, operating costs of 3-5% in upstream and of about 50% in downstream.[4]Moreover, digitalization could create, in the next ten years, about 1trillion dollars for the sector of which 580-600 billion for upstream, 100 billion for midstream and 260-275 billion for downstream. Furthermore, it could improve productivity by about 10 billion dollars, reduce water usage and emissions by 30 and 430 billion dollars respectively and save 170 billion dollars for customers.[5] Therefore in the following sections, the main digital technologies and the digital oilfield are described.

[1]https://www.iea.org/publications/freepublications/publication/MTOMR2016.pdf

[2] H. Hassani, *The role of innovation and technology in sustaining the petroleum and petrochemical industry*, Technological Forecasting and Social Change, 2017, 119, pp. 1-17.

[3] https://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/

[4] https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-next-frontier-for-digital-technologies-in-oil-and-gas#0

[5] http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-oil-and-gas-industry-white-paper.pdf

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