Oil & Gas Research
ISSN: 2472-0518

Letter to Editor Open Access

A Comprehensive Look at How Big Data is Transforming the Petroleum Downstream Industry

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Letter to Editor

Big data refers to the storage, management, analysis, and processing of large amounts of data, as well as its distribution. Data capture, storage, and processing are all recent advances in big data technologies, and now big data is being used in the refinery industry to estimate energy efficiency and reduce downtime, maintenance, and repair costs using various models and analytics methodologies. It's also utilised in the liquefied natural gas and municipal gas distribution industries for maintenance and predicting process and equipment failure. The authors of this research examined how big data is being employed in the storage and transportation of oil and gas, as well as health and safety in the downstream industry and to properly predict future oil and gas markets. There are numerous areas where big data techniques can be used effectively, as well as several hurdles in utilising big data in the petroleum downstream industry [1].

Over the last century, oil and gas majors' energy products have contributed significantly to global greenhouse gas emissions (GHG) and planetary warming. Decarbonizing the global economy by mid-century to avoid serious climate change will need a significant shift away from fossil fuel-based business models. Several prominent corporations have recently begun to talk about renewable energy and climate change, pledging decarbonization policies and investing in alternative energy sources. Some even claim to be evolving into renewable energy businesses [2]. There is a need to objectively examine present and historical decarbonization initiatives and investment behaviour, given a history of obstructive climate activities and "greenwashing." This research focuses on two American and two European majors (Chevron and ExxonMobil) (BP, Shell). We compare the extent of decarbonization and clean energy transition activity from three perspectives, using data collected from 2009 to 2020: (1) keyword use in annual reports (discourse); (2) business strategies (pledges and actions); and (3) fossil fuel production, expenditures, and earnings, as well as investments in clean energy (investments) [3]. We discovered a significant increase in "climate," "low-carbon," and "transition" speech, particularly from BP and Shell. Similarly, we noticed an increase in interest in decarbonization and clean energy strategies. However, pledges take precedence over concrete acts. Furthermore, the financial analysis suggests a continued reliance on fossil fuels in the economic model, as well as small and opaque spending on sustainable energy. As a result, we conclude that the transition to clean energy business models is not taking place, because the scale of investments and actions does not match the rhetoric. Greenwashing charges seem well-founded unless actions and investment behaviour are brought into line with language [4].

Past research on petroleum supply chain networks has essentially separated three key decision-making aspects: integrated planning, uncertainty, and multi-objective setting. This research combines these elements and provides a stochastic, multi-objective, mixed-integer linear programming model for strategic and tactical planning of DPSC networks. Demand is modelled using a two-stage stochastic technique based on scenarios as the unknown parameter. The model, which accounts for different supply centres, distribution centres, goods, and means of transportation, also takes into account transshipment between the centres [5]. The goal functions take into account the cost of transportation as well as the cost of product loss caused during transfer between the centres. A case study of a real-world DPSC network undergoing pipeline construction and storage facility expansion is used to demonstrate the applicability of the proposed model. The model is solved using the augmented-constraint approach. The decision-makers can use the model as a decision-support tool to better grasp the complexity, flexibility, and risk of integrated decision-making under uncertainty by analysing interesting trade-offs in the case study [6].

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Received: 10-May-2022, Manuscript No. OGR-22-64380; **Editor assigned:** 12-May-2022, PreQC No. OGR-22-64380(PQ); **Reviewed:** 20-May-2022, QC No. OGR-22-64380; **Revised:** 25-May-2022, Manuscript No. OGR-22-64380(R); **Published:** 30-May-2022, DOI: 10.4172/2472-0518.1000242

Citation: Trencher G (2022) A Comprehensive Look at How Big Data is Transforming the Petroleum Downstream Industry. Oil Gas Res 8: 242.