

# Practitioner-Scholar Research Conference

2021

Abstract 1

18-19 June

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## **INFORMING VALUE: INDUSTRY ANALYSIS FOR COMPLEX PROCESS FACILITY DIGITAL TWINS<sup>1</sup>**

*Keywords: Digital Twin, 3D Model, Oil & Gas, Process Industry, Industry 4.0, Engineering Data, Complex Facility, Information Asset Executive Summary*

The organizational capability of a firm to create, integrate and maintain cyber versions of complex physical systems known as Digital Twins is key enabler for joining the 4th Industrial Revolution. This article highlights the business case for firms in the process industry to manage them as a valuable business asset based on academic and business literature, webcast and live presentations, and the professional experiences of the author. A digital twins maturity model is provided to differentiate how they are used at each level of data enrichment. Three digital twins asset valuation models are introduced to illustrate informing value from distinct perspectives. Findings include where the oil and gas sector lands on the innovation adoption curve, how knowledge is generated from digital twins, and how informing value can be realized from maintaining digital twins over the full asset lifecycle. There are many software applications and tools that have become available for firms to adopt this innovative technology, however integration with the diverse and often siloed systems that serve as data sources have been hampered in the past by inconsistent data governance, data exchange requirements, and interface standards. This article, the first in a series of three, explores this problem of practice and efforts underway to mitigate this challenge as interest in application of this innovative technology reaches the tipping point where industry-wide adoption drives greater efficiency and improves decision making throughout the supply chain and complex facility lifecycle.

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