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## **Digital Oilfield Projects: A Perspective Using Examples From Reservoir and Reserves Management**

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### **Abstract**

Digital Oilfield programs are underway in many oil and gas companies. The term ‘Digital Oilfield’ covers a wide range of areas from the usage of smart downhole sensors to the integration and transformation of data across technical and business applications for decision making in the oilfield. Ultimately the decisions made at the operational level affect the company’s performance and hence Digital oilfield projects are connected with the decision making at different levels in the company.

This paper analyzes different types of digital oilfield projects from the literature and draws upon the authors experience to create a perspective based on the common requirements of such projects. Such a perspective should help reducing silos within organization often looking at their own data and work processes. Examples from the area of Real-time Reservoir management and Reserves management will be analyzed by going into the details of the common elements across these areas in terms of process and data requirements, data standards and components of the work processes. By understanding the common requirements organizations can lower cost in terms of reuse and deployment of the solutions across the company.

This paper will help engineers understanding of digital oilfield projects and assist in increasing the uptake of such projects within their organization.

### **Introduction**

Oil and gas producing companies are challenged with increasing supply to meet the growing global hydrocarbon demand. Companies are responding to this challenge amidst an ageing workforce and deeper complex, smaller reservoirs with advanced technology and IT solutions. It is expected that the next generation of oilfield professionals will need to be far more productive than the previous generation [1]. Some viewpoints estimate integrated information technology solutions to improve productivity of about 20% of missing employee base [2]. Progress and implementation of Digital Oilfield projects are expected to bring an increase in productivity of Oilfield professionals. Published articles from CERA and Chevron clearly quantified some of the estimated and operator benefits respectively. Typical benefits include Reducing downtime, Improving ultimate recovery, Accelerating production, Improving efficiency, Reducing costs and HSE incidents. [3]

### **Digital Oilfield Projects**

Several Digital Oilfield projects are underway in Oil and gas companies and different terms may be used to describe these projects / initiatives, but there is a common underlying theme. As an example one paper [4] talks about Real-time Asset Management which encompasses

- ‘Real time Production optimization’ - concerned with updating the reservoir and production model and
- ‘Integrated Asset Performance management’ - overall workflow which encompasses all the workflows in ‘Oilfield Management’. This paper [4] describes the different oilfield management processes at a high level and also depicts the interplay of the sub-processes.

The examples chosen in this paper are from (Real time) Reservoir Management and Reserves Management. These 2 areas are chosen because they closely related by having common data requirements. While Reservoir Management is at the asset level, Reserves Management typically is a priority at the Organizational level.