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Abstract

Oil and Gas operations require a large amount of data acquisition which is often faced with numerous data confirmation struggles. Sensors network can be optimized as a live-feed of Oil and Gas uncertainties to reveal and provisioning anomaly events in a tangible Oil and Gas environment. The embedded network of sensors plays a huge role in digitalizing these operations especially in critical environments, to ensure data is accurate, reliable, and repeatable.

The Internet of Sensors (IoS) is likely mediated as a communication connectivity of tangible components, including sensors for data assets acquisition, distinguishers for distinguishing the origin of data asset, interpreter program for interpretation of data asset, and internet network for data assets transmission and reporting. Some temperature and pressure sensors provide real-time data on well conditions, while other sensors determine air toxicity in areas where harmful gases are found. Every sensor can be distinguished independently from other sensors and exchange information with them through digital embedded network, empowering beneficial and automated Oil and Gas operations.

Sensors are being utilized for Oil and Gas data acquisitions to refine repeated data when a unique particular use-case scenario is concur within the environment in real-time. The data refining is applied through a mathematical logical reasoning within the embedded hardware sensor. A network of sensors will play a major role for the purpose of functional surveillance and take immediate and intelligent actions/responds to a certain event/s within Oil and Gas circumference. The goal is to evaluate the most predominant sensors technologies in Oil and Gas facilities as the upcoming momentum is going towards replacing conventional sensing methods with IoS applications, which will add live feedback and control over Oil and Gas. To distinguish whether a sensor is applicable for IoS or not, it has to meet two criteria: gather information for interpretation, and IP address for tracking within a sensors network. The result is a formed understanding of what the leading technologies applications provide both in sensing and communication.

This paper related the unification of tangible Oil and Gas environment and the digital network of sensors. It analyzes the sensors applications, comparing different features and designs, to find what works best in different Oil or Gas scenes. A guidance and consideration for the proper IoS specifications, utilization, and applications is presented in this paper for the benefit of the IoS design engineer.