



What happens when O&G field services meet IoT, Mobility and Cloud

The Technology Services Industry Association (TSIA) recently pointed to an interesting aspect of 2016-17. The association, in its annual survey in which field services are a critical component, said that planned spending for the year would be “high” with top spending categories for field services being self-service portals, customer experience analytics and parts and logistics¹. Let’s spell out the message in this finding: digital adoption in field services will grow and investments in IoT, Mobility and Cloud will be exponential. With customers wanting everything to be Uberized - meaning, faster and flexible service at lowered costs - traditional field service practices will fall by the way side. Organizations will have to redesign their field operations with particular attention to unifying currently fragmented solutions.

Field operations are among the most challenging activities for Oil & Gas companies, particularly in Upstream. Units are scattered in difficult terrain across the globe. Services available in these locations are very conservative in nature. There are incongruent geo-specific operators using diverse local products (with spares and support availability as the deciding factor). In addition, local network, communication and technology providers without standardized systems

and protocols, add to the operational challenges. O&G companies are therefore forced to set up local offices that co-ordinate and manage contracts with a growing number of diverse partners.

Traditionally, field communications consists of communication, IT and upstream specific systems for announcements and environment monitoring. However, as the O&G eco-system expands and becomes more diverse and widely spread, OT (Operational Technology) and IoT are going to be the key influencers of how next gen field operation shape up.

With increasing adoption of IoT upstream field units will see more assets that communicate over non-IP interfaces. These could include wearables, heads up displays, drones and beacons. In most upstream environments, OT systems run as separate entities due to security sensitivity and business criticality. However, efforts are being made to integrate OT with traditional IT networks to enhance remote manageability and reduce operations cost. Implemented correctly, organizations can cut over to experts providing remote asset monitoring and operations support. The direct impact of this would be to make the best resources available but also reduce the cost associated with deploying (scarce) onsite expertise.

¹2016 TSIA Member Technology Spending Report (Support Services)

Value creation with next gen field operations

To work out next gen field operations, it is imperative to look at the components involved at each stage of the operational cycle along with the integration points that deliver an end-to-end Field Service Framework. Wipro considers the next generation of Field Services as a major value creator for O&G organizations.

We build next gen field services using FieldNXT, a framework that starts with the concept of a 'Unit'. A Unit can be a single asset (example: a server or a CCTV camera) or a combination of multiple interconnected assets or a field site as a whole. For field services, each Unit should have

certain operational and performance parameters which need to be monitored, measured and analyzed. The parameters need to be extracted from the asset and classified based on their criticality. Edge Analytic devices (such as OT equipment and devices armed with data sensors) themselves can perform an analysis of the data or send the data to a central store for further analysis. Once analyzed, the unit should get represented as either a healthy one which does not need any attention (green); below threshold but operations can continue (amber); or in a stage of criticality (red) that needs appropriate attention.

Once elements of a Unit are integrated to a DAG (a data aggregation gateway that acts as a local statistics collection agent), the DAG stores and performs preliminary analysis of the events. If critical events are identified, those events alone are sent to a central data store for further analysis. The DAG uses interfaces suited to multiple field devices. These have to be developed based on the type of field devices to be on boarded. This is a key constituent of the FieldNXT framework.

- **Transport:** Generally IP WAN/MPLS, VPN over Internet, satellite links, microwave links or GSM/LTE-4G are used to transport critical event data. During low traffic hours all event data will be sent to the central data store for historical analysis. This data can be used

The 9 steps to success with FieldNXT

- **Defining a Unit:** A field Unit consists of multiple interdependent elements. Each element is defined with a set of operational and performance parameters with their respective KPIs. Defining a Unit with classification of parameters makes the operating model agile and accommodative to change.
- **Aggregation:** The aggregation of all sub components of the unit are required to achieve the following:
 - Define the interdependence logic
 - Build the operational conditions (such as critical, anomalous, normal)
 - Filter out insignificant data at field aggregation level for efficient use of bandwidth (required to transport the data) and analytical resources

to extract further insights on unit performance, extrapolate to predict behavior and proactively prevent downtime.

▪ **Cloud Infrastructure for Analytics:**

Since the FieldNXT framework looks at consolidation of all assets as a single unit it is imperative that critical events sent by the Edge Analytics devices are aggregated using cloud infrastructure. This infrastructure also hosts the real time analytics stack. At a higher layer it provides cognitive and predictive inputs to other support systems. This critical piece plays a pivotal role in on boarding IoT devices that are going mainstream.

▪ **Remote Management:**

Remote Management is the central component of FieldNXT. Almost all enterprises nowadays have monitoring tools and software installed at various locations. Most of the IT assets are monitored from central Network Operations Center (NOC). This eliminates the complexity of support provides with varying processes at each location.

▪ **Service Desk as Central Ticketing Tool:**

The FieldNXT framework considers Enterprise Service Desk as the single source of ticket logging and closure. Any process flow for operation and management of assets should start and end at the Service Desk.

▪ **Service Management Layer:**

Field Service has many stakeholders. They must be integrated in the overall service framework. A cloud hosted SIAM (Service Integration & Management) tool which sits on top of the Service Desk and manages/ controls issue resolution is ideal for a complex field service eco-system.

▪ **Integration Layer:**

Integration between various layers of field service is the next most important aspect of the FieldNXT framework. This means integrating:

- Management Tools with Service Desk
- Service Desk with Service Management software
- Analytics engine with Service Desk and both with Asset Management systems
- Service Desk and Asset Management systems with Workforce Management systems
- Service Desk with L2/L3 Support Desk
- Service Management layer with partner ecosystem for ticket exchange
- Service Desk and Analytic engine with Reporting Dashboard
- Mobile app layer and Reporting Dashboard with Mobile Device Management system

The complexities of field service

- **Defining Process Flow:**

The ticketing application is integrated with the asset management system to provide parallel information about asset state (critical events, location, and balance life) and attributes (serial number, support coverage, managing partner, etc). If the Service Desk cannot

With the current challenges in the O&G industry of uncertain demand and falling prices will find a natural resolution in the course of time, organizations must pay attention to what it signals. There is a need to explore avenues that keep operations stable at predictable costs. In this context, some factors that O&G players must note:

- **Role of IOT & Security:** The widespread adoptions of IoT will have a serious impact on field services. Edge Devices will need on boarding, equipment will have to be retrofitted with sensors, interfaces will need to be developed and analytical systems put in place. The growing number of touch points between devices and systems will make them vulnerable. Security concerns will also grow in proportion. To address this, enterprises will have to adopt a centralized device that acts as a clearing body before on boarding assets, partners and processes. Service providers with established compliance and risk management practices will take the lead in providing digital security.

resolve a ticket, it is assigned to an onsite operations team by the work force management system. At the site, cognitive analytics is performed on data to uncover failure patterns and proactively initiate action. Reporting tools and business dashboards assist business analysts and management teams to drive data-backed decisions.

- **Geo Dimension:** O&G

operations are marked by the spread of field services, posing challenges of reachability. The skills required to support remote sites is specialized and, additionally, organizations need to shore up their legal and regulatory compliance processes. In terms of reachability, field services have to take into consideration the nature of the terrain (hostile, rugged, environmentally unstable, etc.), the nearest point from which it can be serviced, travel time and stay arrangements. These determine achievable SLA at reasonable cost.

- **Legal & Regulatory Aspects:**

These are aspects of field service that cannot be ignored. For example, some off shore locations need certification for support personnel to reach the site. In some countries, field service travel can be conducted only if accompanied by locals. There are countries where field data cannot be taken out of remote sites for remote management. These need to be factored into field service processes.

Using Field Units to define the future

▪ Service provider & Partner Ecosystem:

Field services involve a very large number of partners and sub-contractors (communication, logistics, local licenses and permits, government liaison, etc.). Rarely is there a global organization that can service multiple geos in all aspects. With the increase of asset base to be monitored and serviced remotely as well as on field, consolidation is necessary to achieving the desired SLA and predictability of cost.

Upstream O&G companies are already experiencing the impact of digital technologies like Cloud, Mobility, IoT and Analytics. Field Units will need to be a part of this change because they make it

▪ Commercial Model:

Today's field service primarily operates on multiple spend buckets. The variables which contribute to operational expenses are technology spread, quantities of items, achievable SLA, geographical limitations, level of remoteness and local skill sets. These add to the lack of predictability both in Capex and Opex. A commercial model based on a predefined catalogue of services can address this challenge.

Field service providers would do well to use the concept of Unit with weight factors of geo, SLA and other local variables.

possible to eliminate uncertainty and introduce cost predictability into processes and functions. The FieldNXT framework addresses this competently.

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