SAP Ecosystem Partners

Achieving Operational Excellence in the Upstream Oil and Gas Industry
Gaining Integrated Business Insight with Rolta OneView™ and SAP® Software

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Operating in a Challenging Environment

Upstream oil and gas companies are operating in challenging times. They are trying to maintain optimal production levels, while increasing recoverable reserves, and reducing unplanned well down-time. They are implementing processes to improve their use of technology to proactively detect anomalies, manage remote well operations, organize logistics and improve enhanced recovery from reservoirs they acquire and develop. Additionally, market price volatility demands accurate and timely visibility to portfolio production yield. Managing CAPEX and OPEX spend is critical for making decisions on portfolio risk, investment, divestment and development. All of these elements impact operations and can easily determine the success of a field, not to mention success for a company.

On top of this, many companies are leveraging recent drilling technological breakthroughs to expand their portfolio by entering the oil and gas shale market. This has increased the pressure on operations to develop prospects faster; which is causing operational execution failures in the areas of processes, systems, suppliers and safety, simultaneously. It is clear that operators need better information to make quick, informed decisions to increase their rate of success and manage workers from different suppliers with 'one version of the truth' for projects. This includes the ability to aggregate multiple data sources to improve work execution; combined with the ability to distribute information to workers no matter where they are located in the world.

The amount of data upstream oil and gas companies generate each year is exploding – in no small part due to the adoption of new operational technologies being used for exploration and production.However, businesses are still only using a tiny fraction of the data they gather for decision making; this is being limited by the current technology platform they have in place to process the information. To improve and optimize processes, a new approach is needed.

Transforming data into insight

Upstream oil and gas companies generate data from many sources at each stage of the upstream lifecycle: exploration, engineering, operations (including drilling, equipment, reliability and location data), projects and business transactional data. Consider a large oil field which can have hundreds of wells; managing all the different data types from different companies, partners and vendors can be complex. The number of well-bores, multi-lateral, and instrumented data generate an enormous load on existing systems to process for decision making. This data, plus real-time information from current wells; needs to be stored, processed, analyzed, and disseminated in a usable manner – which is truly the 'Big Data' challenge of today.

Upstream companies want to increase the speed, accuracy and frequency of data analysis to gain a more precise view of their operational success so they can make quick decisions. Yet the data they need access to is often siloed throughout the enterprise. With numerous disparate information technology (IT), as well as operational technology (OT) systems, it becomes difficult for a company to get a holistic picture. Often enough, manual intervention is required to reconcile business data from disparate systems, which is time consuming, error prone, and not sustainable over time. Basically, this data has tremendous unfulfilled potential and operational complexity in its current state.

To realize the full potential of data insight, a comprehensive solution is needed to gather, cleanse, correlate and consolidate multiple disparate sources; transforming operations to drive improvements in efficiency and a higher rate of operating success. A variety of analytical tools and methods, including operational analytics, real-time intelligence, locational analytics, predictive analytics and Big Data analytics, provide the most comprehensive insight. The pursuit of effective OT-IT (Operational Technology – Information Technology) integration along with integrated cross-functional analytics can streamline processes, optimize costs, and create substantial value.

The value comes from the continuous improvement that is possible when organizations have complete insight into their operations and processes. Organizations need to make continuous real time improvements across key functional areas of their business (reservoir management, drilling, sub-surface, production operations, facilities management, and pipelines to name just a few examples) and set measurable financial, operational, and safety goals. Effectively managing these improvements is directly tied to how well an organization is able to convert an array of operational and business data into meaningful insight directly affecting their bottom line.

Obtaining insights from this data is a key part of the journey to achieving operational excellence (OPX).

> "Solutions such as Rolta OneView™ will play a critical role in transforming plant management and drive growth." Frost and Sullivan "Oil and Gas Information Technology – Enabling Operational Excellence" September 2011

Introducing Rolta OneView™

Rolta OneView™ is an Enterprise Intelligence (EI) solution that enables role-based, actionable insight and correlated operational and business intelligence (BI). Available from Rolta, a strategic SAP software solution and technology OEM partner; the solution was developed by BI technology experts working closely with oil and gas industry specialists who have decades of firsthand experience with industry processes and challenges.

The data models and KPIs of Rolta OneView™ are specific to the oil and gas industry; including more than 400 pre-built KPIs derived from industry standards and up stream knowledge models. The solution combines the core functionalities of information technology with engineering and geospatial information systems. It extracts key information from the functional and operational systems in each business area, verifies the integrity of the information and aggregates it to an industry-standard data model to improve decision making.

Rolta OneView™ breaks down the fundamental barriers to achieving operational and business excellence - such as silos across operational networks, business networks, safety and sustainability networks, and enterprise social networks. It provides a 360-degree view of the enterprise and touches the nerve center of all critical functions, quickly integrating with existing systems, instilling best practices, and accelerating process improvements. Rolta OneView™ for SAP combines the best of Rolta's domain expertise with cutting-edge technologies from SAP to deliver faster ROI (return on investment) and dramatically lower TCO (total cost of operation), making it a win-win-win proposition.

With Rolta OneView™, your operations team can access a single version of data to manage processes and make faster, more informed decisions to operate the business. The assimilated information is presented in dashboards and reports designed to provide actionable insights to individual managers based on their roles in your business. When something requires attention, the solution generates alerts so managers can drill down through the data to identify root causes.

Rolta OneView™ brings a unique perspective to upstream oil and gas intelligence. It monitors operational and asset performance key performance indicators, while at the same time delivers insights across asset classes like shale oil and gas, offshore, deep water, and conventional oil and gas. These insights intersect analytics derived from the functional (operational) areas into a single unified view, and bring together descriptive, predictive and prescriptive analytics.

Rolta OneView™ in more depth

Rolta OneView™ for Upstream Oil and Gas provides analytics and insight for major areas of operations, including: shale oil and gas, offshore, deep water, conventional and unconventional projects. These asset insights are based on performance measures for the specific project areas named above and integrate with operational systems (like SAP Plant Maintenance). They improve work execution and decision making by providing asset and engineering data to workers in a single, unified view – integrating descriptive, predictive, and prescriptive analytics.

Some examples: **Descriptive analytics** inform the manager how the wells performed in the past year. **Predictive Analytics** tell the manager about the wells' probable future production performance, using a variety of statistical, modeling, data mining, and machine-learning techniques. Prescriptive analytics specify remedial actions to prevent a well from shutting down (i.e. due to degradation issues, such as excessive wax deposition or sand production, as an example).

While business insights deliver the high level visibility that CXOs need, the individual KPIs bring clarity and insight to operational managers. With timely access to such insight, companies can speed up their decision-making and improve consistency in work execution.

Predictive and prescriptive analytics proactively identify potential areas for equipment failure; while at the same time enhancing process safety, integrity management, and decision making at all levels of operations.

For example, high level corporate business drivers that are supported by operations and engineering processes at business unit levels include among others the following:

1) Production Volumes Stewardship for Oil, Gas, Condensate, Water

2) Oil & Gas reserves management and stewardship to meet corporate goals

3) Drilling and Exploration goals for target counts, drilled depths and successes

4) Financial stewardship regarding expenses, returns and best capital utilization

5) Most importantly, manage the health and safety of our most important asset – our people

Figure 1 below shows the high level corporate business drivers and ways to manage and monitor them to drive operational and asset level excellence and efficiencies across the company.

With Rolta OneView™ and SAP software, including rapid-deployment options, you can gather and analyze data across key areas of the business to support informed decisions that can help you improve performance.

Figure 1: Rolta OneView™ Upstream Executive Dashboard

Some of the key benefits Rolta OneView™ delivers are:

- Improved Field and Well Performance Tracking

- Improved Reserves and Asset Utilization Management

- Improved Well and Pipeline Integrity Surveillance

- Sustainability in Business Operations

- Crude Blending Optimization

- Improved Safety and Compliance

Case study

A global oil and gas company wanted to increase the overall reliability of its plants and improve the predictability and prevention of asset failures. This effort was aimed at integrating activities associated with Streamlined Reliability Centered Maintenance (SRCM), preventive maintenance, condition monitoring and surveillance, inspection and testing, long-term planning, equipment performance and causal analysis. However, the biggest hurdle was that critical data was isolated in disparate systems and applications spread across refineries, as well as operator logs and various spread sheets.

In just four months, Rolta delivered the entire Operational Excellence and Reliability Intelligence platform across all assets, integrating 28 different data sources. The resulting system delivers vital reliability information on more than 100,000 pieces of equipment to hundreds of operations throughout the refineries. This new analytics capability created a culture where reliability has become a shared responsibility across different functional and business areas. Some of the benefits achieved include:

- Large number of reliability threats identified and resolved
- Major reduction in condition monitoring and surveillance exceptions
- Environmental exception events at a historical low
- Reduction in cost of incidents
- Increase in the run lengths of operating units
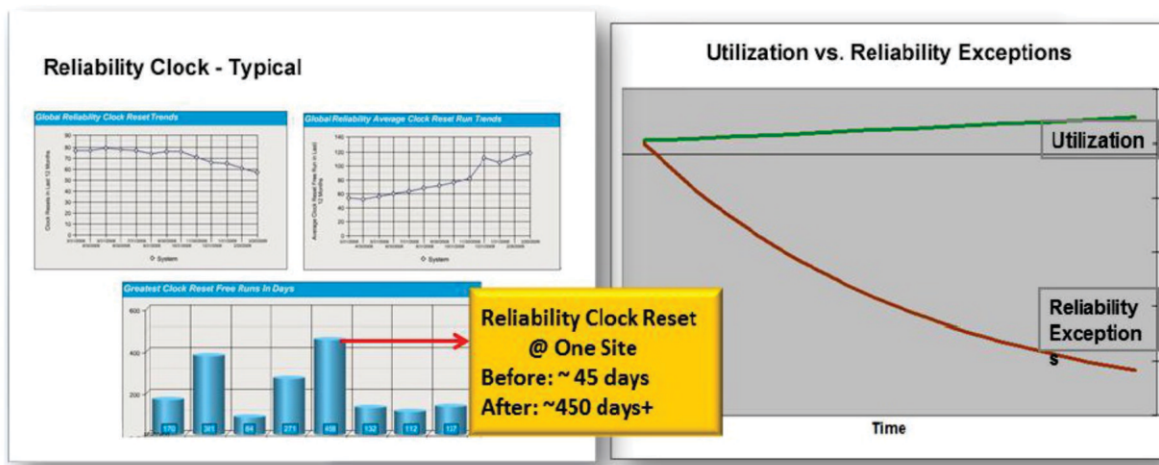
A comprehensive and scalable solution architecture

The architecture of Rolta OneView™ simplifies complexity across an enterprise's disparate data sources. The various plant operational and business systems are loosely coupled yet comprehensively integrated via Rolta OneView™.

The heart of Rolta OneView™ is a data model based on industry best-practices and recognized operational standards. This model maintains the cross-functional information collated from various data sources across operations and enables performance management and analytics. Analytics include trends, slice-and-dice analysis, drill-down functionality, forecasting, predictive analytics, variance analysis, root cause identification, scenario planning, and what-if modeling. The solution is fully scalable across an organization's multiple sites and businesses, which enables consistency in asset and process performance measurement, as well as continuous improvements.

An organization can pace its adoption of pervasive business intelligence with the Rolta OneView™ enterprise architecture. Built on the SAP BusinessObjects™ Business Intelligence and SAP HANA platform, the architecture delivers a robust, reliable, maintainable, and scalable foundation for pervasive analytics. The overall architecture, including performance analytics and real-time intelligence, is illustrated in the figure below.

As Figure 2indicates, Rolta OneView™ features comprehensive analytic functionality that enables historical, real-time, geospatial, Big Data, and predictive analytics on large and distributed data sets on a single platform. For example, Rolta OneView™ integrates engineering design systems with all other system so that business users can analyze asset information across the entire lifecycle (for example "as-designed" versus "as-operated" versus "cost-to-maintain"). They can interact with field and well models, view and analyze operational and design parameters on a single dashboard.
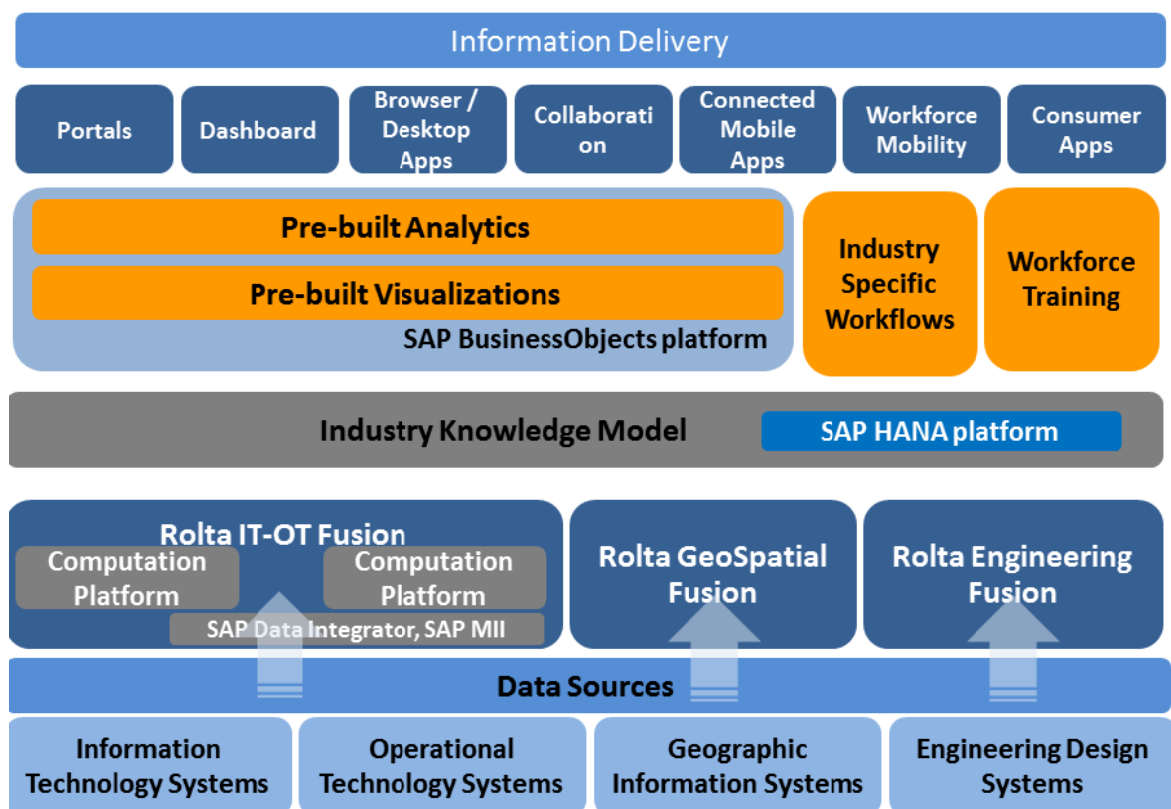

Figure 2: Rolta OneView™ Solution Architecture

OT-IT Fusion: Integration of real time field operational systems such as SCADA and High Frequency systems (such as PI) used in downhole and surface monitoring is combined with IT systems that include well, engineering and surface facilities

Geospatial Fusion: Integration of location data such as XY values, global coordinate system(and conversions) for wells along with well path trajectory data when combined with engineering and business data provides the geospatial fusion of rich data

Engineering Fusion: Engineering designs of equipment and facilities when combined with business data

Knowledge Model: Various oil and gas vertical specific knowledge models (such as from Reservoir, Drilling, Production, Facilities, etc…) when combined with functional knowledge models involving Assets, Operational and more models

Figure 3 - **Rolta OneView™ Upstream Executive Dashboard Details**

SAP Software Powers the Performance

Rolta OneView™ utilizes SAP HANA to deliver a high-performance analytics solution based on modern, in-memory, columnar data structures. The underlying metadata, modern dashboarding, adhoc querying and analysis capabilities are built upon the market-leading BI platform of BusinessObjects. Rolta OneView™ leverages BusinessObjects Data Integrator for the ETL – for the Extract, Transform and Load operations to build the data warehouse. In parallel, Rolta OneView™ is able to leverage the predictive analytics capabilities of SAP InfiniteInsight and the visual data exploration interface provided by SAP Lumira. All these mean that customers gain from the IT-OT fusion that Rolta OneView™ delivers on top of a proven, modern, scalable technology platform provided by SAP – truly a profitable fusion of capabilities.

Gaining the benefits in less time with Rapid Deployment

Get up and running faster and more efficiently

To help companies quickly realize the benefits of comprehensive business insight, Rolta has created three rapid-deployment solution (RDS) modules of the Rolta OneView™ solution including:

- Rolta OneView™ RDS for operational insights
- Rolta OneView™ RDS for asset insights
- Rolta OneView™ RDS for maintenance and reliability insights

The modules effectively combine SAP software and content with Rolta software and services. They are preconfigured solutions that deliver sophisticated BI and EI functionalities quickly and affordably in each area of operation.

Rolta installs the rapid-deployment modules within a predetermined time-frame, cost, and service scope. Each Rolta OneView™ RDS module integrates SAP and non-SAP data sources, and when used with the SAP HANA platform, provides operational data insight previously unavailable due to an enterprise's vast data volumes. The average time frame for a typical deployment is 12 weeks or less. This can help oil and gas companies lower the cost of implementation and speed the time to value, while retaining the flexibility to extend the solution if required.

The Rolta OneView™ RDS modules help you leverage your technology investments for a consolidated view of SAP and non-SAP operational systems as well as your enterprise IT systems. They support operational benefits in the areas of increased asset availability and safety, and reduced energy and maintenance costs, while tracking and coordinating production and inventory.

Rolta OneView™ RDS for **operational insights** helps companies:

- Improve quality of production
- Lower costs of production and improve utilization
- Minimize factors causing opportunity losses
- Identify potential failures before the actual occurrence
- Achieve predictable performance and improve reliability

Rolta OneView™ RDS for **asset insights** helps companies:

- Analyze and manage underperforming assets
- Minimize asset downtime
- Analyze asset performance and compare with engineering design data and design documents
- Gain locational intelligence for an asset
- Increase asset utilization and reliability Improve asset cost analysis and reduce cost of ownership

Rolta OneView™ RDS for **maintenance and reliability insights** helps companies:

- Maximize asset availability
- Avoid unplanned shutdowns
- Improve plant maintenance compliance
- Optimize cost of ownership
- Improve turnaround
- Achieve predictable performance and improve reliability
- Attain higher workforce utilization

All the rapid-deployment modules can be implemented separately or in any combination, depending on the area of focus you desire.

While business benefits are dependent on the modules that have been installed and implemented, Rolta has observed the following benefits based on various deployments of Rolta OneView™:

- Reduction in downtime of 5% to 10%
- Improvement in asset efficiency of 5% to 15%
- Increase in asset availability of 3% to 5%
- Increase in savings with improved reliability project performance of 2% to 10%
- Decrease in operational costs of 15% to 25%
- Improvement in schedule adherence of 15% to 30%
- Increase in specification throughput of 10% to 15%
- Improvement in inventory turns of 10% to 15%

Rolta OneView™ – designed and built from real-world experience

Rolta is a company with decades of experience in combining IT, GIS, engineering systems and operational systems for the benefit of its customers. Rolta OneView™ was designed and built on the basis of hands-on experience in the oil and gas industry, and benefits from the insights of industry experts employed in Rolta, as well as feedback from our customers.

Rolta is proud of its global strategic partnership with SAP, and is the winner of the coveted Pinnacle Partner award in 2014.

Start your journey today

Why wait? Accelerate your journey toward achieving operational excellence, with Rolta OneView™. You will find that the solution enables you and your executives to make more well-informed decisions faster, to help you improve operational processes and performance. Gain the holistic insight needed to strengthen profit margins, identify operational problems, improve safety and attain greater clarity about past, current and future performance. With Rolta OneView™ and SAP software, you can improve the synergy across people, technology and business processes to help your organization realize the full benefits of operational excellence.

For further information

To learn more about how Rolta OneView™ and SAP software can help your business achieve operational excellence, visit Rolta at www.rolta.com or SAP at www.sap.com.

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