

Striving Operational Excellence through IT-OT Fusion



Welcome!

In today's competitive marketplace, organizations are expected to be world-class and out-distance the competition. Every organization is operating with urgency to improve upon the current state of performance and create competitive advantage by bringing excellence in everything they do and therefore creating better value proposition to the stakeholders. Organizations can achieve this by deploying continuous, reliable and scalable processes at an optimized cost in other words by achieving "Operational Excellence". Operational Excellence is the achievement of World Class Performance through the alignment of People, Systems and Tools to Deliver Safe, Reliable and Profitable Production.

Studies have proven that more than 60% of such Operational Excellence programs don't achieve the desired results due to the lack of a well-defined and executed change management or paradigm shift. A paradigm shift towards a transparent information ecosystem across the landscape that empowers every role in the organization would be critical to achieve individual and collective objectives and thereby achieve Operational Excellence (OpX). A single version of truth that effectively leverages data and information regardless of its source will be a key differentiator for organizations moving forward in implementing OpX. Operational Excellence has become a necessity not just for profitability / margin purposes, but for sustained and long term success and growth. Cost optimization, Quality and Productivity improvement have now become key levers for gaining competitive advantage.

Knowing more about the business and knowing it faster than others is the best way to power innovation & stay ahead of competition. As much as the processes are critical for the operational excellence, DATA is becoming paramount for the decision making in a more confident way including prediction and optimization. While organizations have been traditionally using DATA for controlling the performance, leading organizations exploit BIG DATA to excel. The information landscape in asset intensive industries such as Oil & Gas, Refineries, Petro Chemicals, Utilities spawns across various networks - Business Network, IT Network, Operations Network, Safety network, Enterprise social network, GIS network etc.

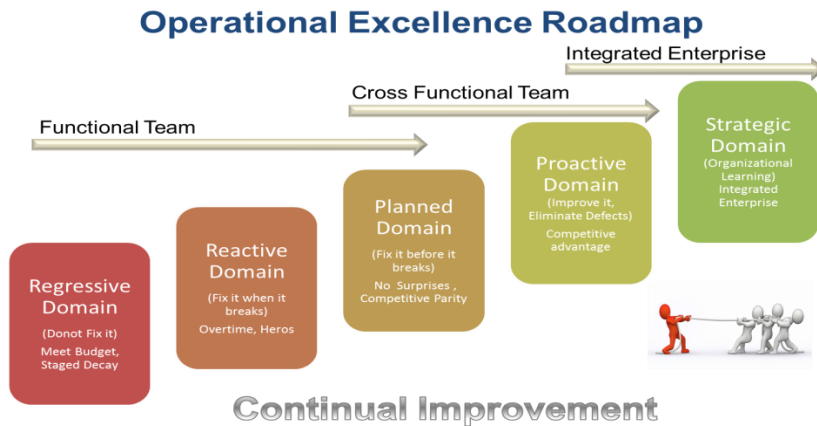
In this paper, we will discuss regarding Rolta's Point of View for achieving Operational Excellence. Rolta believes in 8 key elements of Operational excellence which are having set of objectives and objectives are having set of Key Performance Indicators. Rolta's Operational Excellence approach is based on Balanced Scorecard framework which suggests that we identify Objectives from 4 important Perspectives of Balance Scorecard and analyze them to achieve Operational Excellence. Rolta's unique value proposition through its Rolta OneView™ that includes Rolta's patented IT-OT Fusion™ becomes a critical lever for enabling a pre-built, rapidly deployable solution in weeks for striving Operational Excellence.

Operational Excellence is achieved on the foundation of achieving cross functional visibility and actionable insights across the enterprise which necessitates "**Contextual Fusion of IT-OT Systems**". Data from IT and OT systems needs to be structured into a logical data model, built on a foundation of core domain understanding of the business value chain. Leveraging this model, asset-rich companies can transform from disconnected or minimally integrated IT and operational technology environments, into integrated businesses. CIOs and other digital business leaders are increasingly looking for proven solutions to achieve IT/OT alignment and eventual integration.

Organizations want to achieve the business outcomes concurrently along with the transformation programs. To ensure Faster and higher ROI at lower TCO and risk, pre-built, ready-to deploy highly flexible productized solutions built-on proven industry-specific knowledge models, IT-OT fusion & Big data analytics are vital. Rolta OneView™ is an innovative, comprehensive and powerful technology-agnostic open-standards based solution that provides such transformative IT-OT Fusion as well as Big Data analytics solution that helps breaking down organizational barriers, driving 360-degree strategy percolation across the entire value chain and accelerating operational excellence. Rolta OneView™ is a proven solution used by organizations across the globe in various industries like Oil & Gas upstream, Refineries, Petrochemicals, Chemicals, Power Generation, Utilities – Electricity, Water & Gas, etc. Leading industry analyst firms like Gartner, Forrester, Frost & Sullivan, ARC, WRC, etc., as well as industry associations, OEM providers like SAP, Oracle, IBM, etc., and worldwide customers have provided high accolades to this multiple award winning solution.

Operational Excellence

Operational excellence is a systematic approach for attaining world-class performance in productivity, quality and delivery of services and/or goods. It is the goal of achieving superior yields, lead time through-put with safety while eliminating waste.



Operational excellence is not a destination, but a journey. There is no easy way or short cuts for Operational excellence

Rolta's Operational Excellence approach

Rolta's innovative approach brings a paradigm shift on the convergence of business and technical perspectives keeping People at the core to empower them on their roles at strategic-tactical-operational levels by providing role based actionable insights through a Domain driven technology solution for striving Operational excellence.



Rolta through its unique pre-built industry-specific analytics solution Rolta OneView™ has been helping organizations implement an “Integrated Enterprise Intelligence” in weeks for operation excellence.

Rolta's Operational Excellence approach is aligned to Industry Business processes and is based on Cross-Functional insights. It includes pre-built business process driven Key elements which are industry specific based on years of domain expertise and best practices. It is a highly optimized persistence of data from the heterogeneous business and operational systems to enable high performance analytics and cohesive view of information across business functions.



Rolta's Operational Excellence approach adapts the Balanced Scorecard framework. Using a balanced scorecard as the management framework allows a company to excel operationally by creating value for customers and stakeholders, such as process efficiency, financial performance, and organizational capacity and readiness. A scorecard system links strategy to what must be done operationally to be successful.

Rolta's approach focuses on the critical few performance measures (KPI's) that provide real business intelligence and contribute to the achievement of operational excellence, employee excellence, and business success. But more important, it focuses on the Elements of Operational Excellence that can be made Actionable Objectives that are the building blocks of Operational Excellence.

Rolta's approach is centered on 8 Key Elements. This approach drives insights across these 8 elements in a meaningfully correlated manner in the context of the business process, thus enabling meaningful cross-functional situational awareness and actionable role based insights through a "Performance Integrity Model"



1. Operations

The major challenge in any industry lies in tracking its operational parameters. Tracking and understanding the operational parameter is the key for any successful decision making. Objective of this Element is to achieve design capacity without excursions, improve capacity utilization and provide better quality control with an improved reaction time.

2. Assets

Every industry has wide variety of assets involved in their business process whether it is physical assets or non-physical assets. Asset management is the systematic process of maintaining, upgrading and operating the assets to deliver the desire level of services. This Element drives the Asset Performance Management (APM) and focuses the organization more on optimized return of Asset investments.

3. Maintenance and Reliability

Plant maintenance can be expensive and time-consuming. Proper maintenance practices are critical to reduce downtime and protect the bottom line. Improvement in equipment

reliability, reduction in maintenance costs, and increased collaboration between manufacturing plant Maintenance & reliability, Operations, Procurement and Finance departments accelerate journey towards Operational Excellence. The objective of this Element is to maintain the capability of the system while controlling costs.

4. Project

Project Element delivers insight into project-based data so all team members can seamlessly track the lifecycle of a project with complete, timely information. Project Analytics provides robust analysis of important project-based data that includes budgets, cost, revenue, Safety, commitments and profitability etc. Information is personalized, relevant, and actionable to improve project performance and profitability.

5. Supply Chain

Businesses collect large quantities of data in their day to day operations: data about orders, inventory, Distribution, Logistic cost, etc. Being able to consolidate and analyze this data for better business decisions can often lead to a competitive advantage. Supply Chain Element provides the capability to reveal opportunities to reduce cost, improve performance. This element takes broader, multidimensional view of supply chain in which, using patterns and rules, meaningful information about the data can be discovered.

6. Health, Safety and Environment

Excellent HSE performance is an integral part of the profitable business management. Safety as per the rules and regulations across the world is further divided into process safety, occupational safety and behavioral safety. Environment management as you know takes care of the impacts occurring to the air, land, water or flora fauna of the world due to the products or services delivered by the organizations and implement mitigating programs to reduce these impacts.

7. Sustainability

The goal of sustainable development is to “meet the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainability monitoring is the practice of measuring, disclosing and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development

8. Business

Business Insights of Finance, Marketing and HR play an instrumental role in an Organization in any domain. While Financial Insights provide a detailed analysis of the financial health of an organization Marketing analysis provide important details like Marketing Expense exposure and Sales volume distribution for the Organization. Human Resources Insights on the other hand provide indispensable details regarding human capital in the firm.



These 8 Elements further drill down to high level **Objectives** which are directed towards achieving Operational Excellence. Each of these elements focusses on achieving these Objectives by measuring the business critical **Key Performance Indicators (KPI's)**.

Objectives are the results that we aim to achieve within a time frame and with available resources. Objectives are more specific and easier to measure. They are the basic tools that underline all planning and strategic activities. Objectives are expressed as continuous improvement actions that can be documented, measured, and made actionable through initiatives and projects.

Once developed, objectives are linked to "Key Performance Indicators" (KPI's). Key Performance Indicators are identified to achieve objectives and work towards Operational Excellence.

Key Performance Indicators (KPI's) demonstrate how effectively an organization is achieving the key business Objectives. KPI's show how the organization creates value for customers, stakeholders, and employees and evaluate an organizations success towards Operational Excellence.

Below image gives a graphic representation of sample High level **Objectives** identified for each of the **8 Elements**

Operational Excellence by Objectives:



Rolta's Operational Excellence Approach suggests that we identify **Objectives** from 4 important **Perspectives** of Balanced Scorecard and analyze them to access Operational Excellence.

1. Financial Perspective

"To succeed financially, how should we appear to our shareholders?"

- Indicators related to profitability and financial goals

2. Customer Perspective

"To achieve Operational Excellence, How should we appear to our Customers?"

- Attraction of new customers, improving relations with customers, improving company image

3. Internal Business Process Perspective

"To satisfy our shareholders and customers, what business processes must we excel at?"

- Optimizing internal processes and improving performance

4. Learning & Growth Perspective

"To achieve Operational Excellence, how we will sustain our ability to change and improve?"

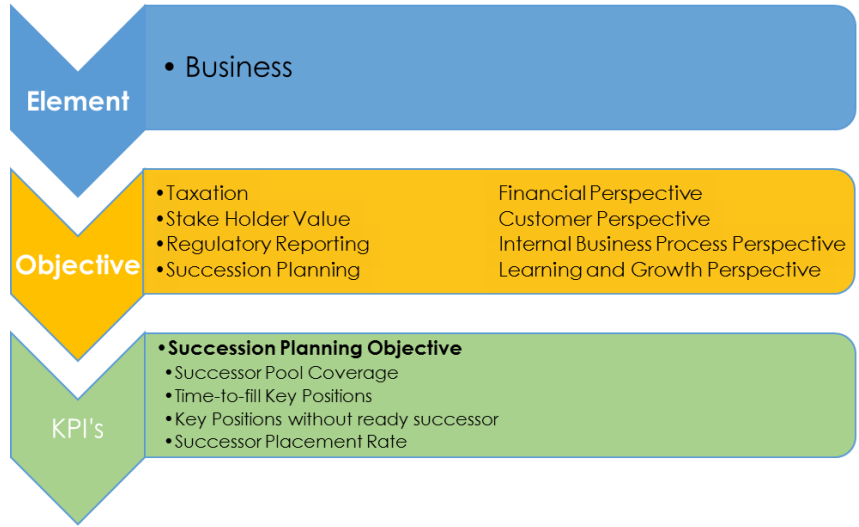
- Education of personnel, growth strategies

Objectives defined above for each elements can classified be further classified by **Perspective** as per the image below





Example: A Business Element has been elaborated below by defining the Objectives identified from 4 Perspectives that we need to achieve Operation Excellence.



Operational Excellence - Corporate

KPIs	Infrastructure	Gas	North	South
19. Work preparation, scheduling and execution				
Generic material ordering (%)	15	12	10	9
Materials achieving original Required on Site (RoS) date (%)	92	75	95	65
Inventory service level (%)	85	95	92	98
Estimating accuracy - hours (%)	3	4	5	10
Estimating accuracy - cost (%)	2	5	4	15
Schedule compliance (%)	82	92	92	98
Emergency maintenance work (%)	1.5	1.2	0	1
Unscheduled / fill in work (%)	2	5	4	15
PM compliance (%)	86	78	98	98.5
CM compliance (%)	99.5	100	99	92
Planned backlog - Corrective Maintenance (Weeks)	8	7	10	5
CMMS Confirmed (CMF) to Technical Completion (TECO) time (Hrs)	75	65	120	15
12. SCEs and Performance Standards				
SCE PM compliance (%)	98	99	99.5	99.2
SCE PM Overdue OLAFD without approved deviation	1	1	0	0
SCE CM Overdue OLAFD without approved deviation	1	0	0	1
16. Materials and Inventory Management				
Materials achieving original Required on Site (RoS) date (%)	81	72	65	98
Inventory service level (%)	75	82	96	98.5
Inventory value	10000	5000	6000	8000
Stock turnover	10	12	5	3
18. Inspection and Condition Based Maintenance				
Inspection compliance (%)	99	98	96	85
PSR deviations for planned inspection activities	5	4	3	0
21. Unscheduled deferment, ORIP and RCA				
Repeat failures	1	0	0	1

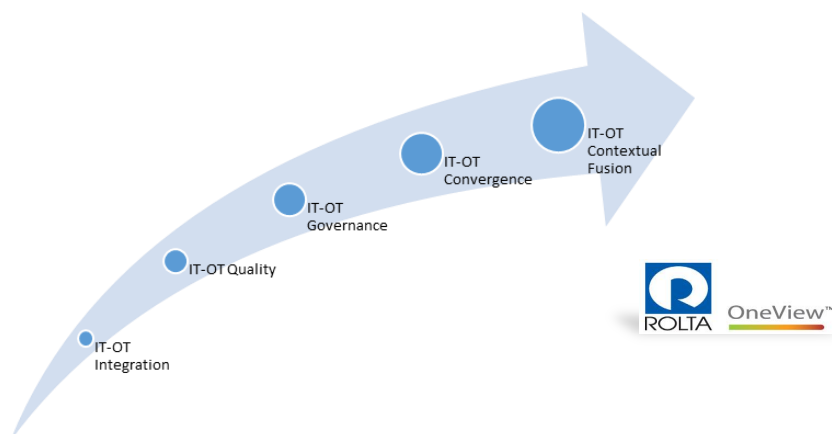
Rolta's approach for IT-OT Fusion

Historically, IT and OT systems seamless integration has not been successful because not just the technologies, but also because of the mind sets, need of transformation and change management.

IT and OT Are Similar But Have Important Differences		
	IT	OT
Purpose	• Managing Information, Automate Business Processes	• Managing Assets, Controlling Technology Processes
Architecture	• Transactional, Publishing or Collaboration	• Event-driven, Real-time, Embedded Software, Rule Engines
Interfaces	• Web Browser, Terminal and Keyboard	• Sensors, Coded Displays
Custodians	• CIO, Infrastructure, Ops and Apps Professionals	• Engineers, Technicians and LOB Managers
Connectivity	• Corporate Network, IP-Based, Web-Based, Mobile, Wireless	• Control Networks (Increasingly IP-based and Wireless)
Examples	• ERP, SCM, CRM, Email, EAM, Billing	• SCADA, PLCs, Modeling, Control Systems

It is believed that by 2017, roughly half the organizations attempting to integrate IT and OT systems will either exceed their budget or fail to deliver expected benefits due to inadequate data integration tools and architecture for addressing new data types, legacy environments, higher velocities and volumes, lower latency requirements and different interface types in OT environments UNLESS they approach in a sensible way for looking a HOLISTIC approach.

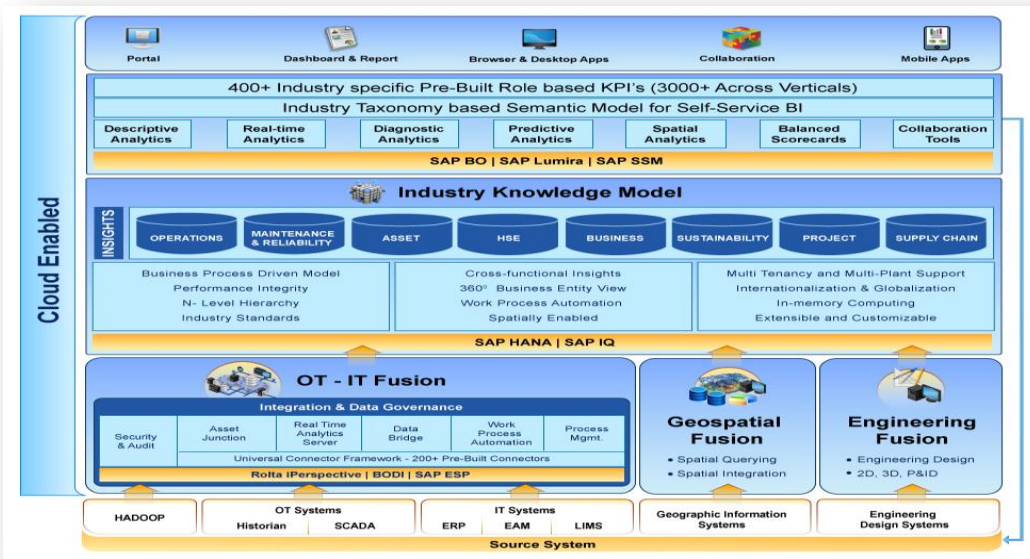
Rolta addresses the IT-OT integration with an innovative holistic approach. It doesn't stop with just "integration", but "Contextual Fusion" to ensure the IT-OT successful. Rolta OneView™ is the only solution endorsed with Gartner's Operational Intelligence (OI) architecture that addresses a holistic approach of IT-OT.



Rolta OneView™ brings unique strengths of 3 decades of Rolta's expertise in Engineering, Geospatial, IT and Analytics thereby combining strong domain expertise and innovative technologies to bring differentiated industry

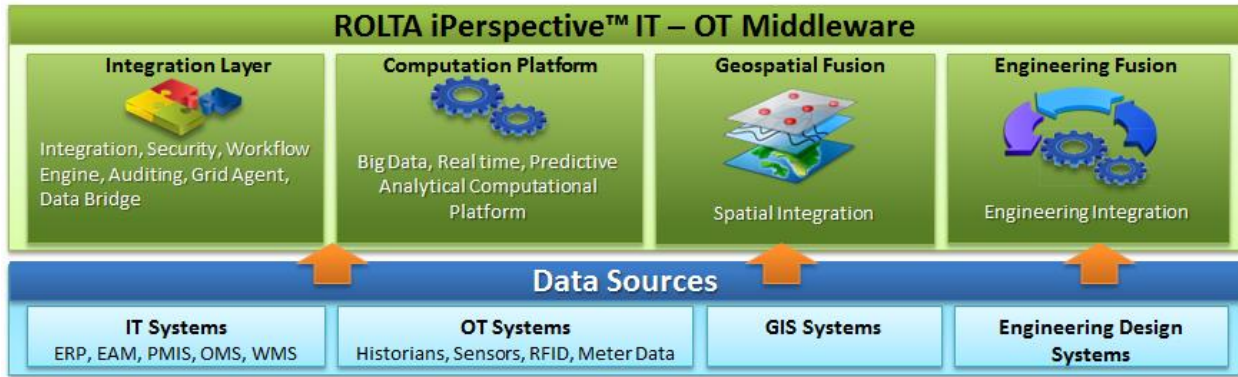


rich solutions for asset intensive industries. Gartner has positioned **Rollta OneView™** as the leading packaged analytics solution in the BI platform landscape unleashing the power of IT-OT fusion driven analytics.



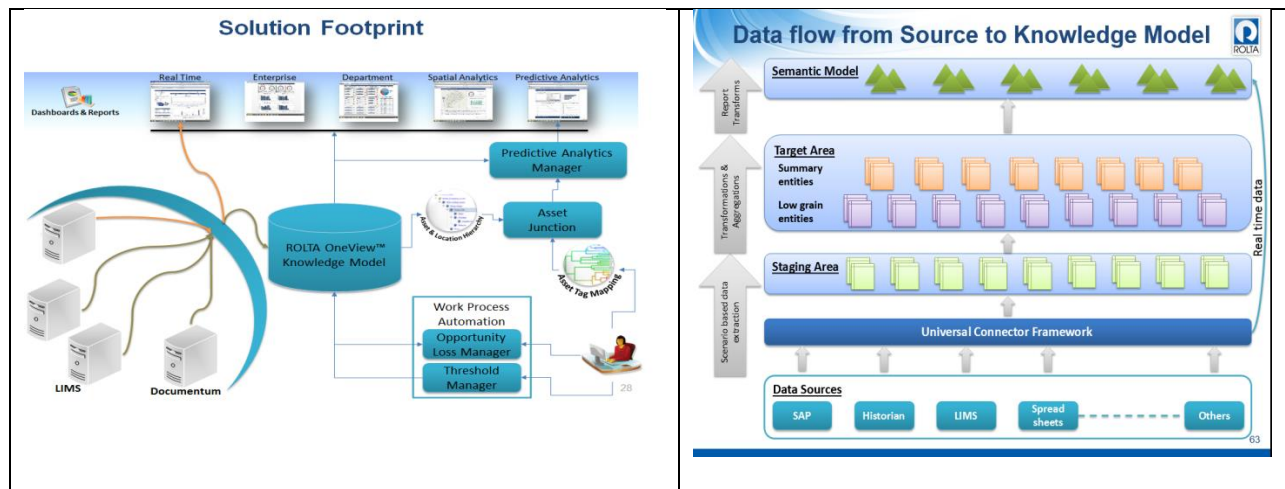
Rollta OneView™ with its patented IT-OT Fusion platform, 200+ pre built, rapidly deployable cross functional analytics business scenarios, 3000+ pre built role based actionable insights KPIs and across all business functions across verticals, Industry standard based knowledge model (Pre built Data model with industry best practices), its differentiated real-time, predictive, prescriptive and locational analytics capabilities, rich visualizations and business user friendly self-service capabilities brings the holistic solution for the operational excellence. Rollta OneView™ as a unique pre-built industry-specific analytics solution that supports multi-site, multi-tenant, Cloud and Big Data, helps organization implement an “Integrated Enterprise Intelligence” infrastructure in a predictable, fixed - cost & rapid deployment model.

Rollta OneView™ includes the patented IP, Rollta iPerspective IT-OT Fusion Suite™, which makes the contextual fusion of data of different types, different velocities and from disparate systems possible. With more than 200 pre-built connectors spanning across operational, business, geospatial, engineering design and Big Data (Hadoop) systems that are proven to handle the volume, velocity and variety of Big Data typically encountered in large to medium enterprises, the universal connector framework of Rollta iPerspective IT-OT Fusion Suite™, offers unparalleled power of accelerated fusion of heterogeneous source systems. It is cloud enabled, which provides the highest degree of optimization of consuming data sources on cloud. Rollta iPerspective IT-OT Fusion™ brings a cross-functional paradigm shift by integrating data from heterogeneous business systems in the organizational eco system. It has pre-built connectivity to IT systems such as ERP, CRM, EAM, SCM and Operational technology (OT) systems such as Historians, SCADA, Distribution automation, Intelligent Meters, Remote terminal units, etc. based on standards suited to specific industry domain.

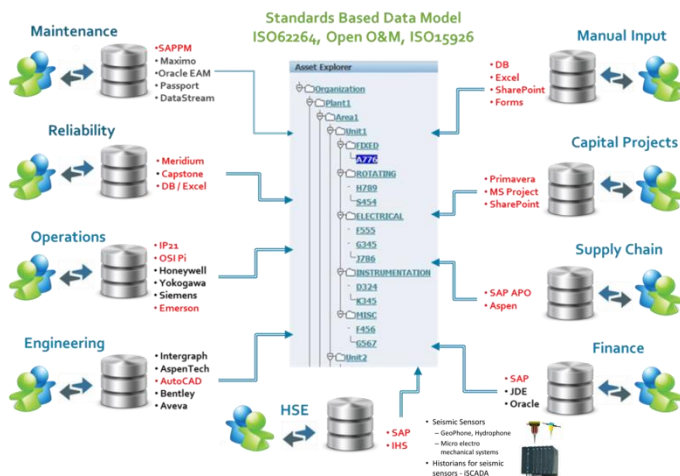


Rolta iPerspective™ IT-OT Fusion (part of Rolta OneView™)

Rolta OneView™ Solution foot print, data flow from Source to Knowledge model can be described as below

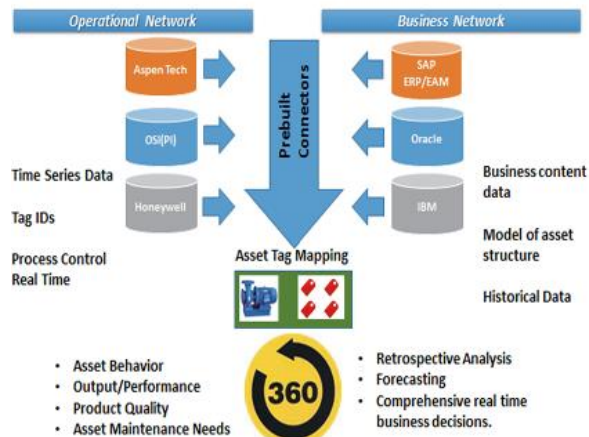


Rolta OneView™ Knowledge Model persists the IT-OT Contextually fused data in an business process model driven data model following the industry standards



Rolta iPerspective IT-OT Fusion™ brings the assets data from the operations network such as Asset Tag ID, Time series data and maps to the information from the business network such as business content data, model of the assets, historical data of the assets etc. and provides comprehensive 360 degree view of the Assets including Asset behavior, Output/Performance, Quality, Asset Maintenance Needs and helps to do retrospective Analysis, Forecasting and enables comprehensive real time business decisions.

Rolta IT-OT FUSION : Asset Junction



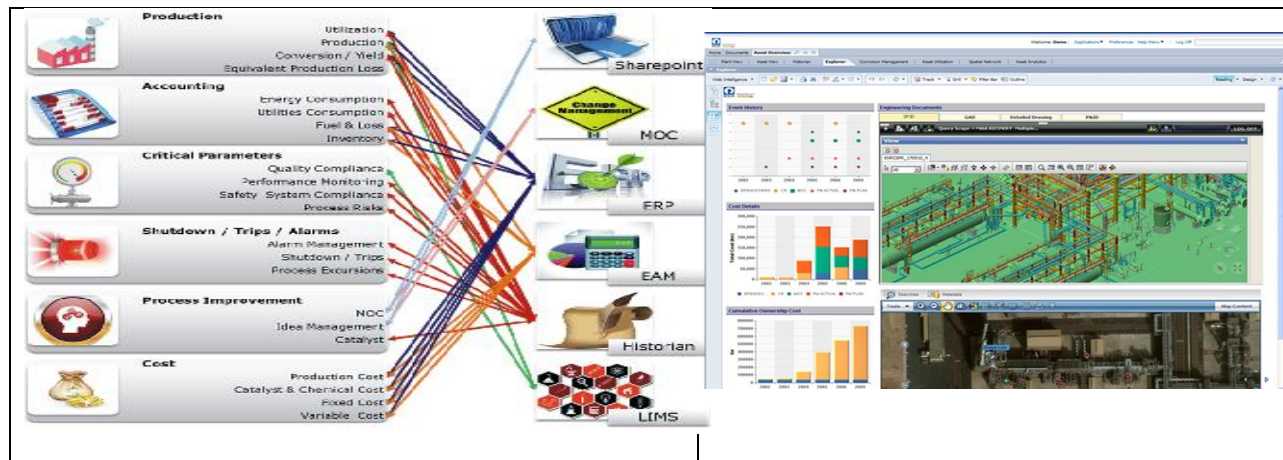
Rolta's patented iPerspective suite powers the IT-OT fusion™ and incorporates a Security layer ensuring that secure access while also enabling consistent security and data governance across IT / OT systems. Big Data represents potentially sensitive data and knowledge assimilated across multi-disciplinary organizational functions and value chains. In essence, it either fully or partially contains, an organization's secret recipes about the way it conducts business. Due care needs to be taken to ensure that only the relevant information is visible to the authorized pairs of eyes, and at specified timeframes. The challenges are obviously due the humongous volume, rate and variety of data. Rolta OneView™ to provide stringent security to Big Data.

Spatial Data itself is becoming Big Data in its own context. Rolta is a pioneer in the field of Geospatial Engineering & Analytics and has specialized compatible solutions to address niche requirements. Rolta's IT-OT Fusion™, fuses the spatial data with heterogeneous data sources and business systems and spatially enable the applications and provide contextual analytics. Enterprises can thus take quick and effective decisions by the ability to visualize the business and GIS data in a single dashboard.





Rolta Engineering Fusion™ which is a part of Rolta OneView IT-OT Fusion Suite™ brings the ability to connect to Engineering design systems such as SmartPlant™ Foundation gives access to another category of Big Data – the engineering information, design data, relevant documents and the 3D Model.



This helps to bring the design integrity while achieving the real time and predictive analytics for operational excellence which includes: Comparison of operating data with design data and necessary alerting, Easy access to all design information and documents, Abnormal situations management, Reduce planning and scheduling effort, Asset performance analytics, Quicker response to enhance availability and increase uptime

Rolta OneView IT-OT Fusion Suite is highly differentiated by its unique value on addressing all the key functional aspects of the IT- OT integration, Data Quality, Security and Governance as well as, Convergence . Some of the key aspects include,

- Holistically addresses the needs of Data integration, Data Quality, Data Convergence , Data Governance to be able to achieve the true contextual IT-OT Fusion
- Pre-built Connectors for a variety of commonly used OT (Historians, SCADA, Intelligent Meters etc.), IT (ERP, EAM, SCM etc.) and Big Data (Hadoop) Systems
- GRC compliance to securely access data from OT System
- Integrate and aggregate information securely from a variety of sources.
- Contextualize thru a flexible framework – for example the Asset data in ERP and Sensor data in the historians
- Deriving multiple tag values from the sensor data for calculation based real-time monitoring of parameters
- Capability to address both real-time and batch data integration requirements
- Attaching schematic process diagrams for tracking of real-time data against a specific scenario. Ability to view operating parameters in context with a process schematic for quickly monitoring and identifying deviations, if any

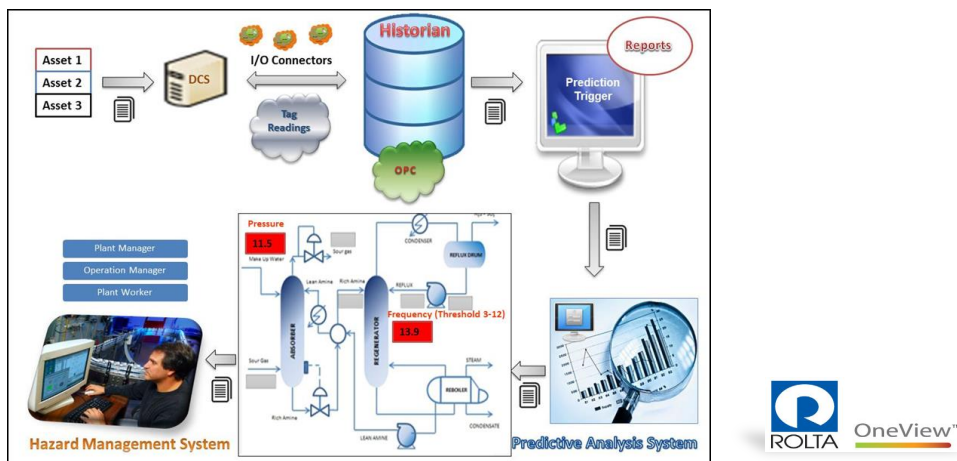


ROLTA

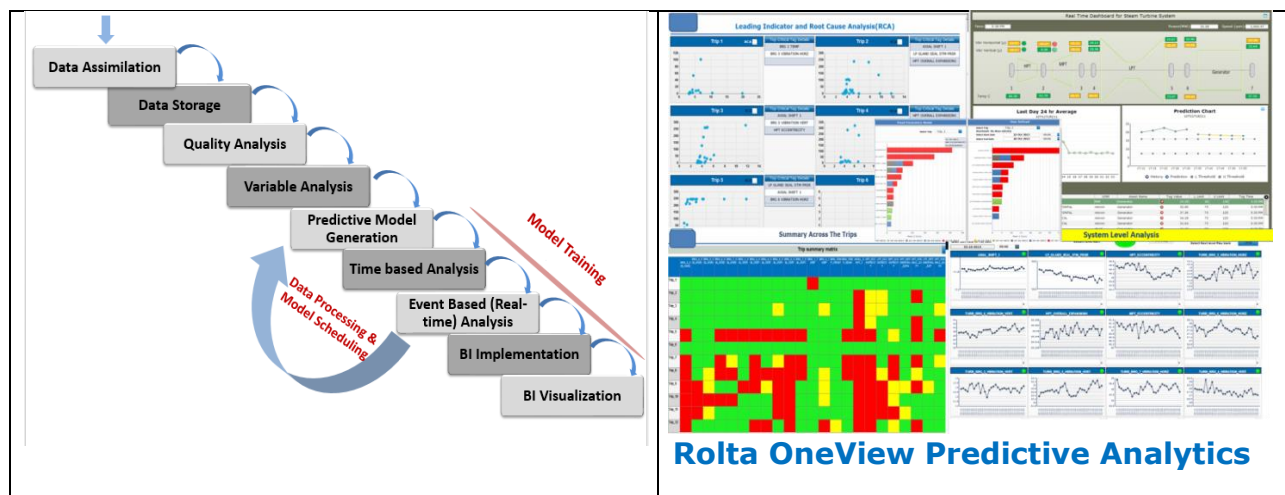
- Ability to schedule and monitor high-volume, event-based transaction processes using a grid based distributed architecture
- Provide a comprehensive 360° view of the assets including Asset behavior, Output/Performance, Quality, Asset Maintenance needs and enable retrospective analysis, forecasting and comprehensive real time business decisions
- Support embedded automated source system health checks and administration mechanism to monitor health of the OT and IT networks
- Support Multi-Tenancy for multi-site / plant support

Driving Actionable Insights with Predictive Analytics

Rolta OneView™ brings the 100x value of the data from OT-IT Fusion through advanced analytics including Predictive and optimization.



With an embedded Data Science workbench [DSW] and Predictive Analytics Manager, Rolta OneView™ provides wide range of pre-built predictive and optimization models with the standard ISO 13374 approach along with pluggable architecture to seamlessly integrate and customize leading modelling platforms such as R, SAP Predictive Analytics, and MATLAB etc.






Summary

Operational excellence is a systematic approach for attaining world-class performance in productivity, quality and delivery of services and/or goods. Rolta’s approach focuses on the critical performance measures (KPI’s) that contribute to the achievement of operational excellence, employee excellence, and business success. But more important, it focuses on the Elements of Operational Excellence that can be made Actionable Objectives that are the building blocks of Operational Excellence

Operational Excellence is achieved on the foundation of achieving cross functional visibility and actionable insights across the enterprise which necessitates “**Contextual Fusion of IT-OT Systems**”. Data from IT and OT systems needs to be structured into a logical data model, built on a foundation of core domain understanding of the business value chain.

Rolta through its unique pre-built industry-specific analytics solution Rolta OneView™ has been helping organizations implement an “Integrated Enterprise Intelligence” in weeks for operation excellence. Rolta’s Operational Excellence approach is aligned to Industry Business processes and is based on Cross-Functional insights. It includes pre-built business process driven Key elements which are industry specific based on years of domain expertise and best practices. Rolta addresses the IT-OT integration with an innovative holistic approach. It doesn’t stop with just “integration”, but “Contextual Fusion” to ensure the IT-OT successful.

Rolta OneView™ with its patented IT-OT Fusion platform, 200+ pre built, rapidly deployable cross functional analytics business scenarios, 3000+ pre built role based actionable insights KPIs and across all business functions across verticals, Industry standard based knowledge model (Pre built Data model with industry best practices), its differentiated real-time, predictive, prescriptive and locational analytics capabilities, rich visualizations and business user friendly self-service capabilities brings the holistic solution for the operational excellence.

	<i>Vision – we aspire</i>	<i>Values – we propagate</i>
 <p>Excellence in Performance</p>	<p>Integrating of the various functions within an organization on a single platform</p> <p>Assuring the best in class performance</p> <p>Provide Right Information to Right person at Right Time</p>	<p>Collaborate across different functions within boundary and across boundary</p> <p>Maximize Reliability and Integrity</p> <p>Measure to Improve</p> <p>Apply Business Intelligence in Decision making</p>
 <p>Shape Best People</p>	<p>Everyone contributes to their best potential</p> <p>Goals are percolated across the organization hierarchy</p> <p>Knowledge drives the business</p> <p>Identify leaders</p>	<p>Teamwork, innovation and openness</p> <p>Empowering personnel and decentralize decision making</p> <p>Setting Benchmarks, challenging trend setters</p> <p>Managing the risks proactively</p>
 <p>Instill Best Practice</p>	<p>Maximize Overall Equipment Effectiveness</p> <p>Compliance to best in class practices</p> <p>Being a leader in Safety, Operation and Reliability performance</p>	<p>Transformation of process to achieve the best continuously</p> <p>Adapt to new development and upgrade</p> <p>Compliance to regulatory requirements</p>