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Analytics and AIM Improve Operational and Asset Performance

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Overview

Operational excellence (OpX) is the key to success in all asset-intensive industries. This includes excellence in operations management, asset performance, EHS compliance, and capital effectiveness. To meet these goals, it's essential for organizations to manage both engineering information and operational data effectively. To do so, they must develop solid analytics capabilities and put asset information management (AIM) programs in place. [1]

Managing engineering information and operational data are essential for operational excellence in process industries. While this need is clear, some organizations struggle to justify the necessary investments in proper information management.

While the need is clear, some organizations struggle to justify investments in proper information management. This two-part series of ARC Insights reviews the ways that analytics and AIM can improve performance in each aspect of OpX. This first report discusses the impact on operations management and asset performance. The next report will review how analytics and AIM can improve EHS compliance and capital effectiveness.

OpX Requires Good Information Management

OpX is an essential ingredient for market leadership in heavy process industries such as oil & gas, metals, bulk chemicals, and power generation.

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1 See Operational Analytics and AIM: *The Foundation for Operational Excellence in Process Industries*, ARC Strategy Report, May 2012

Companies in these industries require large, complex, expensive plants and optimizing these investments is a central focus.

While ensuring high utilization of production assets is important, OpX involves more than just operations and asset management. The amount of capital required to build and sustain process plants is enormous and investors expect the organization to be prudent in its use and provide good returns throughout the asset lifecycle. The products these industries produce and the processes they use can introduce significant risks for people and the environment. Compliance with all regulations is critical to avoid stiff penalties and preserve the organization's license to operate. Many process organizations go further and set additional sustainability goals.

Operational Excellence Has to Balance Many Goals

Overlapping OpX Goals Demand Collaboration

Smart organizations understand that OpX is a never-ending journey. Excellence is a moving target that changes as competitors raise the bar and regulators redefine compliance requirements. Successful programs are built on continuous improvement models that incorporate three basic principles: establish consistent performance to be able to identify opportunities for improvement; make changes in small, incremental steps that avoid major disruptions; monitor the environment to keep abreast of all competitor actions and regulatory developments.

Smart organizations also recognize that continuous improvement is not enough. Obstacles and opportunities arise throughout the journey and organizations must be quick and agile to stay on course. So organizations need a good set of real-time, key performance indicators (KPIs) to know where they are and where they are heading in every OpX area.

OpX goals are highly interdependent, often frustrating control and improvement efforts. Changes to operating practices improve throughput and cost, but can negatively impact equipment reliability. Likewise, they can introduce risks to personnel and undermine the organization's efforts to control the release of harmful byproducts. Less obvious but equally troublesome are the interdependencies between CAPEX and OPEX goals. Choosing the least costly equipment and construction materials reduces capital costs, but can increase operating and maintenance costs.

To overcome these challenges, process enterprises need OpX strategies that promote collaboration across all groups. Good solutions for information management and sharing are essential for this kind of teamwork.

Operational Analytics and AIM Meet the Needs of OpX

Many organizations find building a solid OpX information platform daunting. This may explain why some process enterprises neglect to address this critical issue. But recent developments in "fit-for-purpose" software packages can help reduce the effort and accelerate the benefits.

Operational analytics solutions, for example, enable organizations to fully exploit the data they collect in their operations to help improve performance across all OpX areas. These solutions include powerful data warehouses with operations-centric data models, standard connectors for integration to popular process industry IT applications, and a complete set of analytic tools that can support every data analysis need. They also include pre-built user-interfaces with KPIs for key OpX areas like operations, maintenance, EHS and project management.

Issue	Operational Analytics
Data Models	Pre-built to support asset-centric data and OpX context
Data Storage	Industrial-strength data warehouse for historical data
Integration	Pre-built connectors for popular manufacturing IT applications and automation systems
Dashboards	Pre-built metrics and views for all OpX Goals
Analysis	Full palette from slice-and-dice to advanced analytics

Operational Analytics Meets the Needs of Process Enterprises

Engineering Information Also Requires Fit-for-Purpose Tools

Documents are just as important as data for OpX efforts and they come in many forms and flavors. Standard content management solutions are adequate for managing some, but not all, of these documents. In particular, fit-for-purpose software is required to properly manage and share the multitude of technical documents associated with a typical process plant.

Technical documents contain specific information about the plant's physical assets. They are vital for troubleshooting problems and designing needed plant changes. To manage this vital resource properly organizations need a content management solution that supports complex engineering change management processes, extensive cross-referencing, information duplication, and a variety of unique and proprietary information formats. ARC Advisory Group refers to these kinds of engineering information management products as *AIM for Engineering* solutions.

Issue	Asset Information Management (AIM)
Info Models	Support asset-centric and OpX info access and navigation
Document Management	Supports native formats for all kinds of technical documents and federated content management
Visualization	Viewers for all technical documents from drawings to 3D
Workflow	Supports standard project and other collaborative processes
Quality Management	Supports handover and complex "engineering" MOC

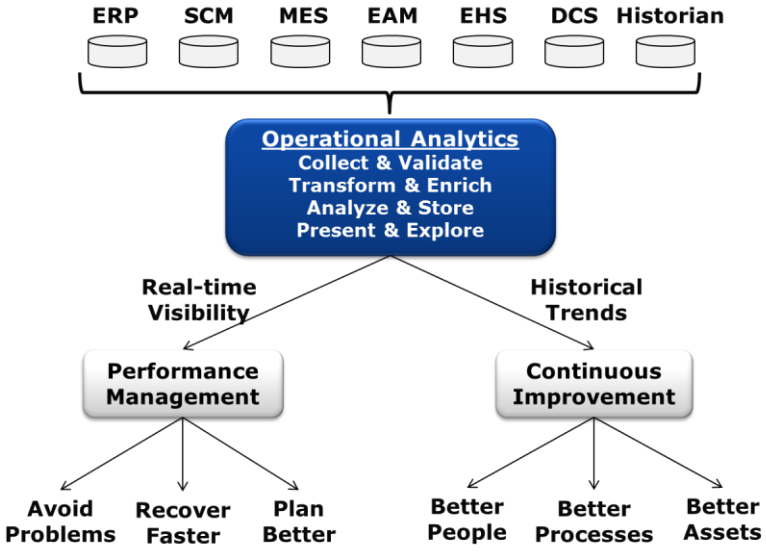
AIM Extends Content Management to Address Special OpX Needs

Operational Analytics and AIM Enable Better Performance

Operational analytics and AIM have different, but equally important, impacts on operational and asset performance. These affect the organization's ability to optimize today's performance and improve performance in the future. Successful OpX programs require both types of solutions.

Operational analytics provide real-time visibility into the status of every operational and asset management activity. This enables the organization to detect and avoid developing problems and reduce the time needed to diagnose and resolve unavoidable problems. Better visibility of the current situation and pending orders also enables better planning. Operational an-

alytics also improve access to historical information, which can provide the lifeblood for efforts to improve people, processes, and assets.



Operational Analytics Provide Better Visibility and History

AIM improves current and future performance through better access to trustworthy information. This leads to higher productivity, faster decisions, and fewer mistakes for everyone involved with operations and asset management. AIM also enables individuals and groups to share information to improve collaboration and avoid cross-impact problems.

AIM Provides Better Access to Trustworthy Information

Recommendations

To assess the value of these benefits ARC recommends that organizations consider how each improvement impacts its version of key performance indicators for availability, utilization, rate and quality/yield. The following table shows where organizations should expect significant improvements.

		Availability	Utilization	Rate	Quality/Yield
Operational Analytics	Avoid Problems		✔		✔
	Recover Faster		✔		✔
	Plan Better	✔	✔	✔	✔
	Better People	✔	✔	✔	✔
	Better Processes	✔	✔	✔	✔
	Better Assets	✔		✔	✔
AIM	Higher Productivity	✔	✔		
	Faster Decisions	✔	✔	✔	✔
	Fewer Errors	✔	✔	✔	✔
	Better People	✔	✔	✔	✔
	Better Processes	✔	✔	✔	✔
	Better Assets	✔		✔	✔

Operational Analytics and AIM Impact on Key Performance Indicators

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