# The Imperative for Change in Utilities

*Leading Practices for Enterprise Asset Management in Utilities*

# Content



# Introduction

01

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Since the late 1990s, hundreds of utilities worldwide have implemented SAP to better support their business operations. In that same twenty-year time period, SAP's Enterprise Asset Management (EAM) solution set has evolved considerably. It is now the de-facto industry leader in terms of foundational Asset and Work Management functionality and User Experience in its most current form. Additionally, SAP EAM integrates natively with the core modules of SAP ERP.

The SAP technology environment has evolved as well (e.g., in-memory databases such as SAP HANA®), with vast improvements in processing speed, usability, and solution stability all realized since most "legacy" customers implemented SAP. SAP S/4HANA® is positioned to carry tomorrow's digital utility well into the future. Mobile device capabilities now place SAP's rich EAM functionality in hands of users anywhere for ease of access and a vastly improved user experience. SAP has also demonstrated commitment to the burgeoning Internet of Things (IoT) and Predictive Maintenance space with its Intelligent Enterprise Asset Management suite – capabilities to further drive the utility industry's success well into the future.

There have been massive improvements in technology, tools, and SAP functionality. But many utilities have not kept pace with these innovations. Here's why: for the most part, over the last 20 years, SAP technology changes were incremental and evolutionary, causing few utilities to adopt every change or improvement as it became available. Even progressive utilities (i.e., the "early followers") found it difficult to justify the adoption of every feature or function addition, as the incremental benefits realized through these improvements were modest. For many utilities today, the result is an archaic landscape where fragmented business processes, siloed data, and intensive manual processing are considered the norm.

Utilities that embraced every conceivable incremental improvement (i.e., the "early adopters") were in a constant state of flux. Their result was a complicated landscape replete with best-of-breed solutions that lacked native integration and a user base suffering from acute "change fatigue."

When it came to implementing enhancements for EAM, it turned out to be a no-win situation. Whether an organization embraced the changes or not, they were rarely making an impactful return on their investment.

# With that kind of history, you may be wondering, why change now?

Progressive organizations are digitally transforming and with good reason: customer expectations for a consumer grade user experience, increased demand for substantial risk mitigation, changes in the competitive market, and a continually evolving regulatory environment. SAP S/4HANA brings significant increases in speed, user experience, and data analytics that can help reinvent the energy industry and future-proof your utility business.

# The Imperative for Change

1

## STAKEHOLDERS ARE DEMANDING CHANGE

Keeping pace with the breakneck speed of technological change is difficult for any industry but is particularly tricky for a long-standing, entrenched sector such as Energy and Utilities. For most of the past 20 years, utility customers, communities, and regulators weren't very demanding of utilities. Keeping the lights on and the gas flowing was enough. Within the last five years, though, that narrative has changed dramatically as stakeholders (customers, communities, investors, and regulators) demand more from their utility providers.

The operating environment that is now the reality for many utilities is profoundly more challenging than it was even ten years ago. Communities expect more from their utility companies and are more open to overturning the regulated, natural-monopoly utility model with community choice aggregation or municipalization models in which local governments procure power for residents. Consumers now expect a seamless and intuitive user experience from all service providers. Regulators have grown impatient and have imposed increasingly stringent enforcement mandates as world events – climate change, environmental rules, and natural disasters – throw their orderly regulation into chaos.

2

## UTILITY CLIENTS MUST MAXIMIZE RETURN ON INVESTMENT QUICKLY

Our utility clients commonly indicate a desire to invest in programs that maximize return over the shortest timeframe possible. Regulated utilities are particularly keen on delivering business benefits reliably as regulators tend to take "offsets" against cost recovery embedded in customer's cost-of-service based rates. As a result, utilities require a high degree of benefit certainty, but finite (3-4 year) general rate case cycles create a time-boxed duration for benefits realization.

3

## OPERATIONAL EXCELLENCE DELIVERS TANGIBLE RESULTS

Utilities may not have had to worry too much about competition in the past, but today it is an indisputable fact. As other asset-intensive industries have long known, operational excellence – consistent, efficient, strategic execution of processes with a clear focus on customer value – maximizes profitability.

- Meeting and exceeding expectation requires utilities to achieve:
- Efficiency gains through consistent and predictable industry-leading business processes across the entire Asset Lifecycle
- Better and faster decision-making as realized via data governance, stewardship, management, transparency, as well as advanced analytics across business functions
- Improved customer service through self-service portals and customer-centric business processes and technology
- Risk mitigation through knowledge transfer and process documentation
- Improved regulator confidence through responsiveness, consistency, and reliability of data and information

Rizing believes that Operational Excellence for SAP EAM is not a static proposition; you don't "set it and forget it." Instead, it is a continual journey.

We can learn many lessons from utilities that have evolved with SAP and that continue to extract additional business benefits from their SAP investment. There are also emerging trends that can be drawn upon to indicate where further future improvement initiatives may be found

# 03 Operational Excellence With SAP EAM in a Utility Environment

?

Every utility is faced with a similar set of operational challenges and should be able to answer the following fundamental questions

- **What assets do I own and maintain?**
- **What is the value of these assets?**
- **What is the current operational state of these assets, and what work needs to be performed to minimize operational costs and maximize performance?**
- **Where are these assets located (geospatially), and is this information in sync with my SAP data?**

Utilities considered leaders in Enterprise Asset Management (EAM) have processes and integrated systems that allow them to answer these questions quickly and confidently. They have the means to access information easily, disseminate it quickly (via reports, mobile devices, scorecards), and they have a regular operational cadence that allows for continual performance improvement.

**A STRONG EAM STRATEGY THROUGHOUT THE ENTIRE ASSET LIFECYCLE ADDRESSES THESE ITEMS:**

Network Planning

Asset Planning

Portfolio Management

Work Management / Work Delivery

Balanced Scorecard

**Each of these strategic focus areas has several SAP EAM solutions explicitly designed to address the utility industry's needs.**

## NETWORK PLANNING

Effective Network Planning needs to be predictive and see years into the future - well enough to guarantee an adequate supply of energy as demand rises.

Planning starts years in advance of the potential business need. It is data-driven and considers asset condition, asset criticality and risk, financial and budgetary constraints, and regulatory and customer imperatives. SAP's flagship solution for long-term Network Planning (1 to 50 years) is Project Portfolio Management (PPM).

This solution provides a powerful tool that allows reliability and network performance engineers to evaluate and propose a slate of capital and operations and maintenance (O&M) projects and programs needed to maintain, improve, and expand the Network as cost-effectively and efficiently as possible. SAP's PPM allows users to manage large portfolios of work and offers configurable "stage gates" that deliberately move the projects through a scoring, prioritization, and queuing process. PPM allows monitoring and evaluating all programmatic work from concept to funding to approval to in-service to retirement. Moreover, the work can be geo-enabled for a map-based view of planned work.

Utilities that can accurately and efficiently forecast needs in the Network Planning area have clear insights into the asset master data and assess asset criticality to avoid risk and high costs from assets' failure.

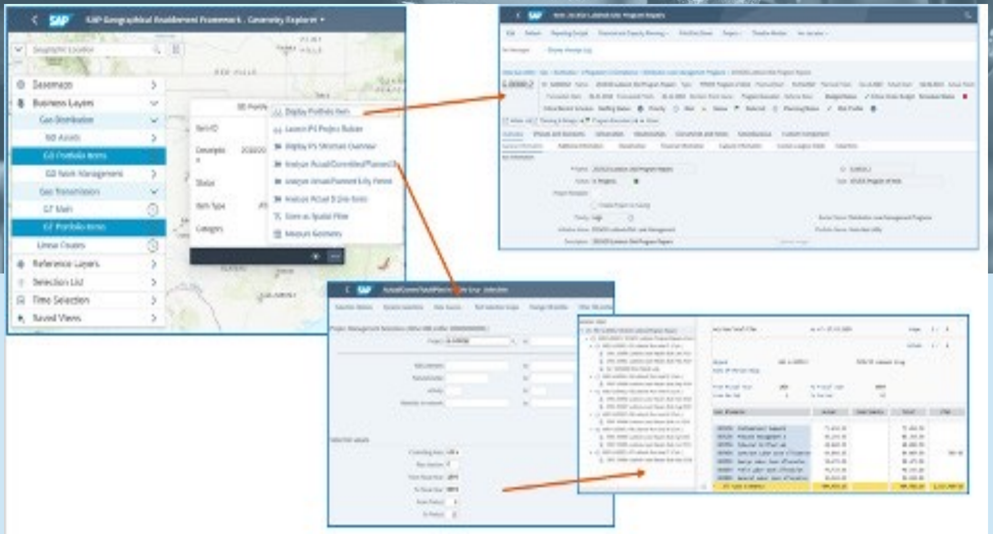


Figure 1: Network Planning can be done geospatially, using a combination of SAP PPM and GEF to visualize, where asset additions, upgrades, and mainte- nance is planned.

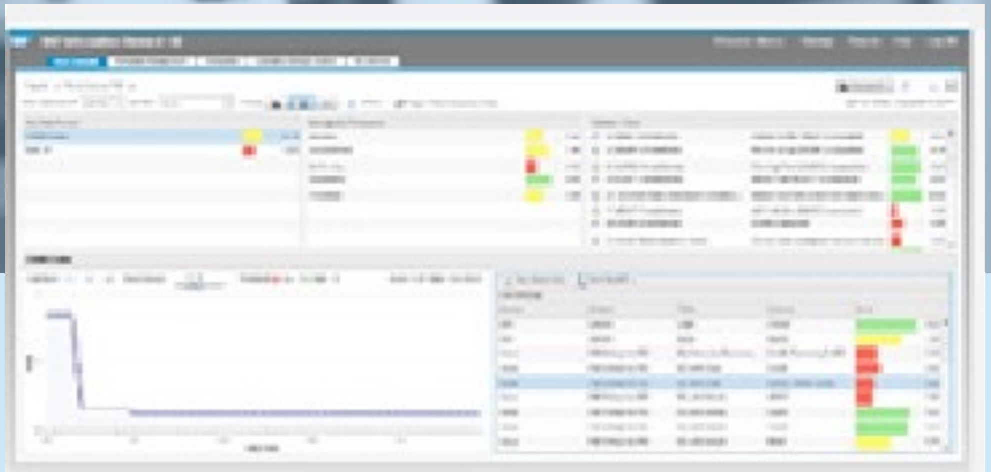


Figure 2: SAP's Information Steward provides dashboards that quickly alert users to a variety of data quality dimensions, and supporting rules.

*SAP Information Steward is the information governance layer of SAP's platform. It provides a comprehensive tool for organizations to monitor data health consistently. Businesses can model asset data taxonomies to ensure data is consistent with internal rules.*

**Successful enterprises regard Asset Master Data as a valuable enterprise commodity. They have a fundamental understanding of asset risk and criticality.**

01

### Accurate data is a priority.

Master data is fully populated, reliable, and audited within a governance structure that rigorously ensures data integrity.

02

### Actionable data includes asset health.

Master data captures crucial asset health information (current and predicted) to make data-driven decisions that drive short-term maintenance and long-term replacement strategies. The health index may be a proxy measure of risk, or risk may be captured separately to further embellish risk calculations.

03

### The process tracks the lifecycle cost

The risk profile has a monetary value assigned to enable the monetization of the network assets. This value is pertinent to the financial evaluation of solution options and the assessment of risk reduction received for the financial investment made.

04

### Physical assets and network demand are tracked.

Data is used to identify potential new network connection demands and general connection trends. This data is geospatially linked to existing assets to reflect the potential scope and timing of future work.

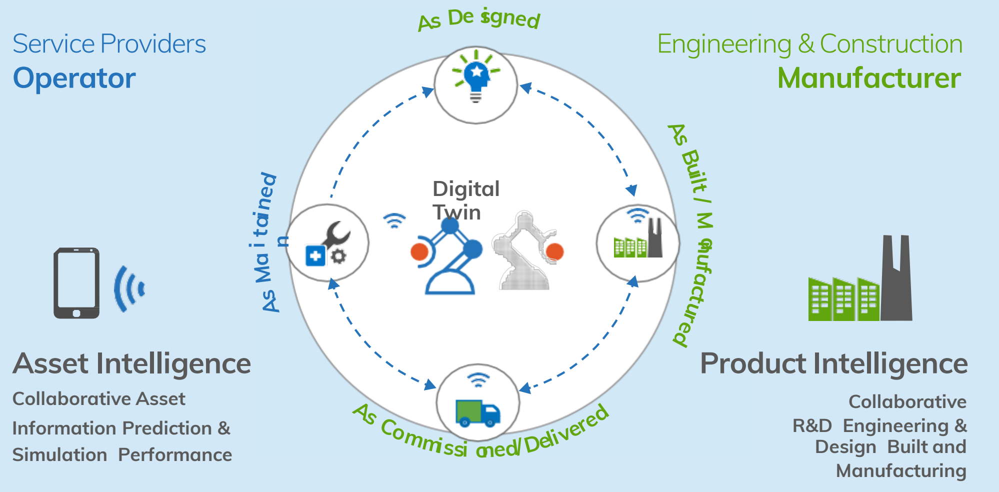
## ASSET PLANNING

Effective asset planning assesses capital assets (pumps, motors, pipes, power lines, and more) to reduce operational and capital expenditures. Knowledge about the assets, environment or operating conditions, risk, health, age, and criticality is pivotal. Asset planning increasingly focuses on predicting future conditions and potential failure. SAP supports all these maintenance and replacement tasks and can be geo-enabled to aid understanding and analysis.

Over the past two years, SAP has made substantial investments in its Intelligent Asset Management (IAM) Suite of solutions. These IAM tools are designed to be used with SAP's Digital Core and were developed with Reliability, Asset Strategy, and use of the Internet of Things (IoT) solutions in mind.

## SAP's Intelligent Asset Management (IAM) Suite includes:

### ASSET INTELLIGENCE NETWORK: SAP'S ASSET INTELLIGENCE

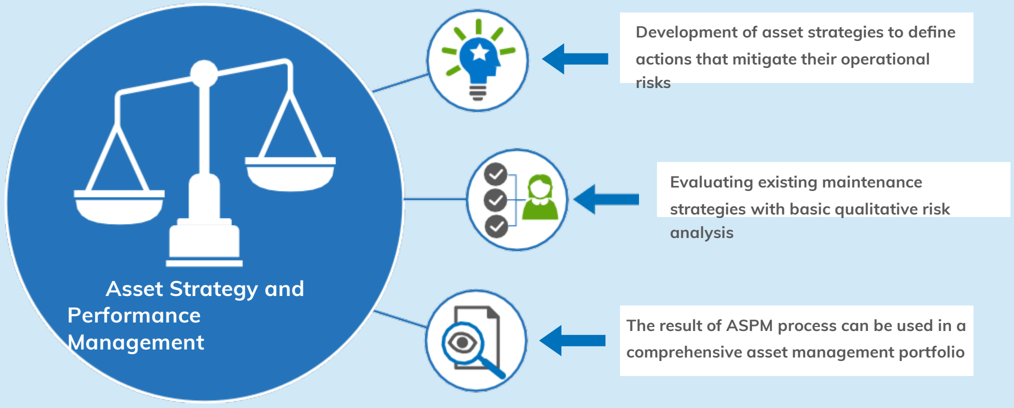



*Network is a Cloud-Based Business Network designed for collaboration between asset owners, manufacturers, suppliers, and service providers.*

*The Asset Intelligence Network allows organizations to model a "Digital Twin" of an asset, and AIN leverages new business models, specifically for trading asset content and services.*

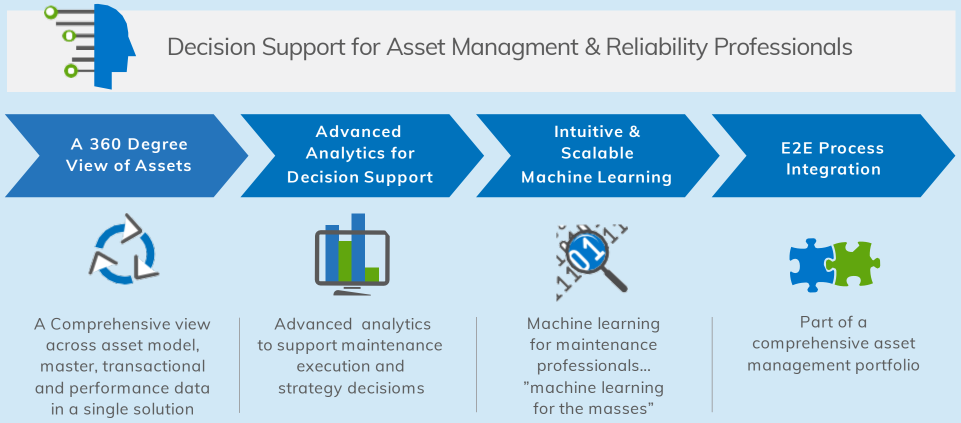
Figure 3: SAP's Intelligent Asset Management Suite is a powerful cloud solution that supports a 360 view of assets and digital twins across the entire asset lifecycle.

## ASSET STRATEGY AND PERFORMANCE MANAGEMENT (ASPM)




*ASPM provides organizations with the ability to define comprehensive maintenance strategies that optimize the balance between equipment performance, equipment availability, and the cost of maintaining the asset. ASPM provides (Asset) Risk and Criticality Analysis and proven methodologies like RCM (future) and FMEA to develop recommended actions, e.g., preventive or corrective tasks.*

## PREDICTIVE MAINTENANCE AND SERVICE (PDMS)




*SAP's PdMS solution provides powerful predictive maintenance capabilities. Failure Alerts, intuitive machine learning, Indicator Forecasting, and a robust analytics engine are all standard.*

Figure 5: PDMS uses adaptive machine learning and intelligence, and a variety of asset specific algorithms to accurately predict asset failure, and when maintenance will be required.

**Utilities performing well in the Asset Planning area display these characteristics:**

01

### A single robust asset repository

Successful utilities have captured all relevant assets electronically into a single robust asset repository and have linked their Geospatial Information (GIS) and SAP registries. They have a routine for determining current conditions and can readily make this information available to personnel that need the data to inform key maintenance tasks against these assets. Normal asset operating conditions and tolerances are defined for each asset class. Abnormal conditions, failure, and breakdown modes are similarly documented.

02

### Core Maintenance Planning Master Data

Time and Condition-based Maintenance Strategies and Maintenance Plans are applied to all assets and reflect external and environmental factors. Asset conditions are trended, and maintenance effectiveness is assessed.

03

### Reliability Centric Maintenance Processes

Leading utilities efficiently leverage operational data as an input into Reliability Centric Maintenance Processes. Sensor and historian data (e.g., SCADA) are critical inputs into reliability algorithms used in solutions such as SAP PdMS for Predictive Maintenance.

04

### Compatible Units

Asset information is based upon design and engineering standards and construction standards (i.e., compatible units or CUs). It is granular enough and readily available so that advanced analytics can be timely and effortlessly run based upon a construction "baseline", which is the Compatible Unit.

## PORTFOLIO MANAGEMENT

Portfolio Management leverages project and program (CAPEX or O&M) data created as part of the broader Network Planning processes noted above. These initiatives inform the longer-term resource plan, and as work moves closer toward execution, resource needs are further detailed and evaluated. As noted earlier, SAP's Project Portfolio Management solution ranks and scores projects  and programs, can be geo-enabled and provides approval and governance  controls. When used in conjunction with SAP's Project Systems module, it  supports detailed project structuring, budget management and cost planning, expenditure control, and full cost settlements to financial Fixed Assets. PPM and Project Systems integration to SAP's Finance and Controlling, Human Capital Management, Procurement, and Materials Management modules ensures that portfolio data is consistent and timely.

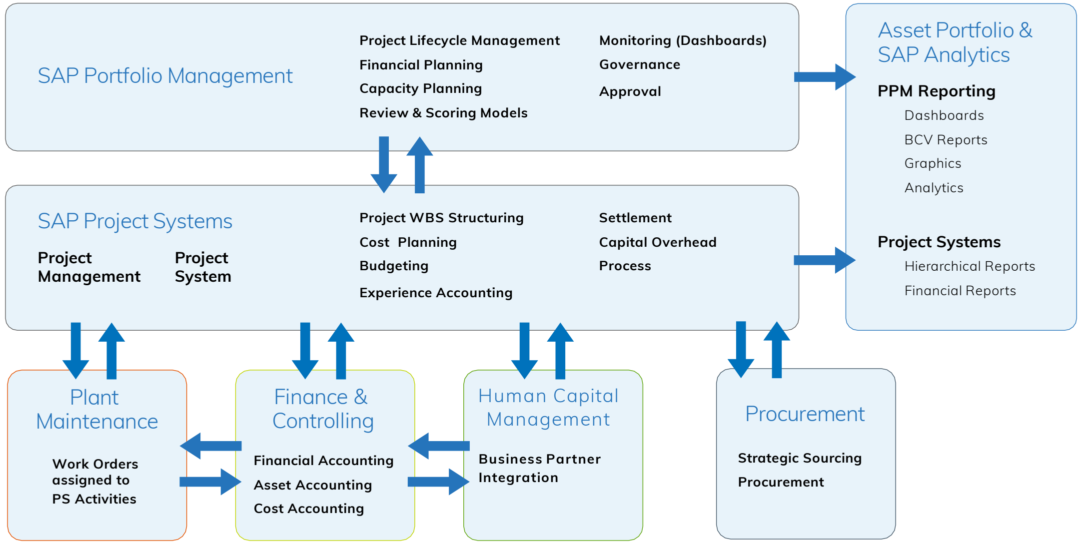



Figure 7: SAP's Project Portfolio Management solution integrates natively to Project Systems.

## Utilities with successful Portfolio Management display these characteristics:

01

**Investment data is organized for successful reporting.** Utilities that run successful Portfolio Management processes have well-defined areas of investment that are organized hierarchically and can drive detailed reporting. High performing utilities also define multiple ways of organizing and reporting on areas of investment across their organizations - for example, by the line of business, CAPEX vs. O&M, by Geographic Region, or by Asset Class.

02

**Project ideation and intake processes are well defined,** with appropriate evaluation criteria, scoring and strategic alignment criteria, as well as quality gates and approval thresholds clearly modelled in SAP Project Portfolio Management.

03

**Approval for Expenditure (AFE) processes are clearly defined,** with appropriate workflows and approval thresholds well-articulated, and modelled in both SAP Project Portfolio Management and Project Systems.

04

**Project Financial Planning, Budgeting, and Forecasting processes are well defined,** with multiple cost planning and forecasting versions and plan accuracies used (e.g., P90, P50, +/-10% Plan to Actual, etc.)

05

**Project Resourcing and Planned work data** is available for consumption in a map view, with work clearly defined geospatially across the whole of the utility's service territory.

## WORK MANAGEMENT/WORK DELIVERY

*Projects and Programs*

This process begins with the identification of the need for work at a program level (e.g., deteriorated pole replacement, vault repair, or cable remediation) and the translation to or creation of detailed resourcing requirements necessary to satisfy these needs (i.e., human, contractual, equipment, and materials). The subsequent development of a resource plan based upon specific program demands follows.

Work and resource planning refer to the activities to be performed regardless of the different work types (e.g., emergency response, preventive maintenance, reliability engineering, new customer connections, or capital replacement programs). This must be consistently done for all workgroups to ensure that all necessary resources are accounted for, the budget implications understood, and limitations/mitigation identified. Once prioritized and selected, it can be reliably executed per the plan.

These activities must be identified well in advance (i.e., months or years) to allow sufficient time to plan for, secure, and onboard the needed resources. For example, the combination of a retirement "bubble" and new work-hour restrictions may necessitate an acceleration of journeyman apprentice programs or external contracting to meet the upcoming workload. By taking all work types into account across all lines of business, the utility can pre-emptively deal with changes in work volume and resource constraints.

The scheduling function prioritizes work and pre-build the manpower utilization schedule for the following shift, day, week, and month. Scheduling requires collaboration with stakeholders to schedule outages and resources. Scheduling must reflect a single shared view of all capital and O&M (both short- and long-cycle) work. It must include all related activities (e.g., right-of-way, contracts, permitting, outage scheduling, traffic control) for all craft and professional services. A single, tightly integrated scheduling system is vital for this effort. A Geospatial view of all work and vehicle automated crew/ vehicle locating is critical to optimize resource deployment and utilization.

## Utilities performing well in the Work Management area display the following characteristics:

01

### Insights into all work and resources are readily available.

They follow a philosophy of “work is work.” All work is visible within their work management solution. Similarly, all resources required to complete work tasks are also visible (e.g., materials, people, plant, and equipment).

Advanced analytics leverage resources more effectively. Crew mobilization can be a high cost of performing work. Smart utilities align related or adjacent work to maximize personnel. Related and adjacent work is evident in the work management process and bundled together within the work management system. Progressive utilities utilize advanced analytics to modify their work execution plans to take advantage of scale economies while leveraging resources more effectively. For example, reconductoring an entire circuit and replacing all poles and transformers can be bundled instead of piecemeal replacement of deteriorated poles and conductor on an emergency basis. This strategy allows other work to be grouped for efficiency and removes the need for subsequent outages, permitting, or the first- responder dispatch.

02

### Work estimates inherently identify labor and material needs.

The financial cost and resource demand for planned work are estimated using assembly or compatible units (CUs). These work estimates are derived directly from the utility’s engineering/design and construction standards. They inherently identify labor and material needs and typically allow material requirements to be directly ordered to support job progress.

03

### Resources can be easily assigned manually or automatically.

Multiple scheduling views are utilized. These typically reflect rough cut/first pass, weekly, monthly, and annual views. Scheduling views are updated regularly, and an electronic scheduling system with automated crew-callout and crew availability self-management enables the assignment of resources manually or automatically. Job task progress on mobile devices aids in predicting job completion and crew availability for subsequent assignments or opportunity work. Customer scheduling windows can be more accurately provided, and proactive customer updates on crew status can be automatically generated.

SAP’s Field Service Management (FSM) is a cloud-based solution designed specifically to manage the planning, scheduling, and dispatch of resources in a complex, customer- focused environment. FSM offers a simple drag and drop scheduling and can match job requirements with technician skill sets.

04

### Workforce data informs the dispatch process.

Work is dispatched and acknowledged/ accepted electronically by the assigned resource (internal or external) via a mobile device. As part of the dispatch function, employee availability is visible before dispatch by utilizing mobile devices, detailed task list progression, and automatic vehicle location. People/competencies/skills and discrete operator qualifications are linked from HR records and employee/crew self-service and are visible to dispatchers to inform the dispatch process.

## 05

### Geospatial data enables work in the field as well as in the office

Digital maps are available, and work can be plotted both in the office and on the mobile device in the field.  Maps provide "situational awareness" and geographical context to maintenance planners, engineers, supervisors, and crew foremen. The provision of a mobile device means that supporting materials are included in the "job jacket," and reference material is also readily available to the work crew (technical standards and maintenance instructions, for example).

*Rizing's Mercury solution  provides a comprehensive tool to synchronize SAP and  GIS to keep these systems of  record aligned and eliminate  asset maintenance in multiple  applications.*


Figure 6: Mercury seamlessly aligns GIS and SAP data into a single comprehensive asset record, and eliminates the need for dual data maintenance.

## 06

### Management of safety and tailboard meetings is informed and consistent.

Job safety instructions and tailboard reviews are provided and created as part of the "job jacket." As work progresses, the actual time is collected against the tasks that comprise the work order. Completion status is updated timely, and as-built assets are created in the system/s of record.

## 07

### Advanced engineering calculations are automated by the system.

Graphical Work Design (GWD) or Graphical Design Tools (GDT) are used and integrated with SAP's Compatible Units library. The Graphical Design Tool contains integrated advanced engineering calculations (e.g., pole-loading calculations, voltage-drop/flicker calculations, and cable pulling tension determination). Additionally, tariff interpretation/application allows for automated review and consistency across the  enterprise.  Automated  workflow and integration with SAP material management systems and asset accounting allow for true work management instead of control by virtue of budgets or accounting.

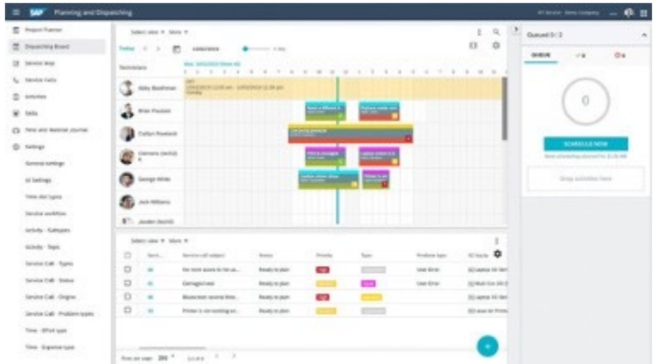


Figure 8: SAP Field Service Management provides a clean, intuitive interface to perform planning, scheduling, and dispatch functions.

*SAP's Geo Enablement Framework is a  map-based user interface that  runs within SAP. GEF is designed to  store asset geometry and provides the ability to view SAP objects (e.g., Work Order, Equipment, Functional Location) data directly on a map.   SAP Plant Maintenance Transactions such as creating Notifications and Work Orders are also available directly from the GEF interface.*

Figure 9:  The map as the user interface is a key feature of SAP GEF.

## BALANCED SCORECARD

A balanced scorecard (or similar enterprise level operational reporting methodology) can and should be considered the "North Star" to which an organization aligns; it should be the eventual sustaining mechanism that continually drives operational performance.

Training and Development Operations establish the performance cadence for work. Work is identified, authorized, resource-loaded, planned, designed/engineered, scheduled, dispatched, executed, and closed within a performance management context – that is, the balanced scorecard. Every crew leader, supervisor, district manager, regional manager, director, and executive are able to quickly and consistently point to good (and great) performance, the areas for improvement, and the individual and collective journey to Operational Excellence.

The myriad of KPIs used by most utilities should be distilled to those true KEY Performance Indicators that represent, in aggregate, Operational Excellence. Too often, utilities label too many metrics as KPIs. Progressive utilities reduce the number of KPI's to eight to ten primary metrics and group remaining KPI's into secondary and tertiary metrics. With this streamlined KPI definition, the focus on Operational Excellence is achievable.

## Effective management of KPI's uses a balanced scorecard

**Primary Metrics -** These represent the half dozen (or so) key performance indicators that the organization should focus upon. When properly weighted and taken together (in a balanced scorecard fashion), these primary metrics can be distilled or reduced to a single view for easy, relative comparison (between regions, districts, supervisors, or foremen/crew).

**Secondary/Tertiary Metrics** –Secondary metrics directly influence the primary metrics. Tertiary metrics are the net-level metrics that help to explain or contribute to KPI performance. Secondary and Tertiary metrics represent the next-level metrics that can be used to drill down into or further analyze the organization's performance – both good and bad. On average, there are a handful of secondary/tertiary metrics per primary metric

**Organizational level** – The balanced scorecard should be consistent and aligned through the organization (both vertically and horizontally) from the senior executive level down to the "deck plate" level where work is performed.

**Balanced Scorecard** – Primary metrics should be representative of organizational performance. Most importantly, should be such that they "self-correct" for inherent contradictions or conflict (e.g., safety versus productivity) and should be carefully orchestrated to achieve this proper balance.

| Primary Metric Suggestions | Leading | Lagging |
|---|---|---|
| Safety (*) | ● | ● |
| Productivity (*) | | ● |
| Human Performance (e.g., CCCI or switching errors) (*) | | ● |
| Cost Effectiveness (*) | ● | ● |
| Call-Out Rate (*) | | ● |
| Non-Conformance Rate (*) | | ● |
| Schedule Adherence (*) | ● | ● |
| Customer Satisfaction (*) | | ● |
| Outage Information Scorecard | ● | ● |
| Driving Courtesy | ● | |
| Vehicle Incident Rate | | ● |
| Storm Performance Report | | ● |
| Vehicle Telematics Report | ● | ● |
| System Reliability | | ● |

## Sample Distribution Construction District/Company Balanced Scorecard

| PRIMARY METRICS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #4 | #5 | #6 | #7 | | |
| District | Safety Performance (DART Rate per 200,000 hrs) | Time (% of total hours per shift) | Human Performance (CCCI Rate per 200,000 hrs) | Cost Effectiveness (Average Hourly Labor Rate) | Call-Out Rate (% Call-Out Accepted) | Rate (Non-Conf Items as %) | Schedule Adherence (Contruction on-time %) | Balanced Score | Rank |
| **Southern District** | 4.62 | 53% | 3.44 | 115% | 75% | 5.11% | 88% | | |
| Foreman Average Score | **6.43** | **7.14** | **7.14** | **5.71** | **6.43** | **7.14** | **4.29** | **6.18** | #3 |
| **Northern District** | 9.10 | 60% | 7.10 | 103% | 94% | 8.0% | 89% | | |
| Foreman Average Score | **2.00** | **8.00** | **3.00** | **5.00** | **8.00** | **6.00** | **5.00** | **4.95** | #4 |
| **Western District** | 0.15 | 57% | 2.60 | 113% | 82% | 3.4% | 92% | | |
| Foreman Average Score | **10.00** | **7.50** | **10.00** | **7.50** | **8.33** | **9.17** | **5.00** | **8.50** | #1 |
| **Eastern District** | 1.70 | 58% | 5.80 | 122% | 88% | 4.0% | 96% | | |
| Foreman Average Score | **6.66** | **10.00** | **1.67** | **3.33** | **10.00** | **4.17** | **10.00** | **6.67** | #2 |

| | | Green | Yellow | Red | Weighting |
|---|---|---|---|---|---|
| #1 | Safety Performance: Rolling aggregate crew Days Away Restricted Duty andTransfer rate per 200,000 equivalent hours worked. | Less than or equal to 2.0 | Between 2.0 and 5.0 | Greater than 5.0 | 25% |
| #2 | Productive Wrench Time: Hours per shift of productive work time, exclusive of breaks, travel, and site prep, divided by total shift. | Greated than 55% | Between 45% and 55% | Less than 45% | 20% |
| #3 | Human Performance: Measured as Crew Caused Circuit Interruptions rate per equivalent 2000,000 hours worked. | Less than or equal to 3.0 | Between 3.0 and 6.0 | Greater than 6.0 | 15% |
| #4 | Cost Effectiveness: Average aggregate hourly labor rate divided by straight-time rate for all crew members, inclusive of OT. | Less than 110% of aggregate rate | Between 110% and 125% | Greater than 125% | 10% |
| #5 | Call-Out Rate: Crew member aggregate call-out acceptance rate, represented as a percentage according to automated call-out tool. | Greater than 80% acceptance | Between 50% and 80% | Less than 50% | 10% |
| #6 | Non-Conformance Rate: Number of non-conforming inspection items per WO as a percentage of total. | Less than 5% non-conformance | Between 5% and 10% | Greater than 10% | 10% |
| #7 | Schedule Adherence: Construction complete on or before date schedule at start of 24-day scheduling process. | Greater than 95% | Between 90% and 95% | Less that 90% | 10% |
| | Numerical Score | 10 | 5 | 0 | 100% |

## Sample Foreman Balance Scorecard

| PRIMARY METRICS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #4 | #5 | #6 | #7 | | |
| Foreman | Safety Performance (DART Rate per 200,000 hrs) | Productive Wrench Time (% of total hours per shift) | Human Performance (CCCI Rate per 200,000 hrs) | Cost Effectiveness (Average Hourly Labor Rate) | Call-Out Rate (%Call-Out Accepted) | Non-Conformance Rate (Non-Conf Items as %) | Schedule Adherence (Contruction on-time %) | Balanced Score | Rank |
| Bennet, F | 0.75 | 62% | 2.6 | 108% | 71.0% | 4.0% | 96.0% | 9.50 | #1 tie |
| Jackson, L | 9.1 | 68% | 7.1 | 103% | 94.0% | 8.0% | 89.0% | 4.50 | #6 |
| Johnson, M | 2.4 | 50% | 2.6 | 115% | 82.0% | 5.5% | 92.0% | 6.25 | #4 |
| Ramirez, T | 0 | 42% | 1.1 | 126% | 65.0% | 1.0% | 85.0% | 5.50 | #5 |
| Slater, D | 1.5 | 53% | 4.1 | 118% | 79.0% | 4.0% | 91.0% | 6.75 | #3 |
| Smith, A | 18.6 | 41% | 5.7 | 120% | 45.0% | 11.0% | 62.0% | 1.25 | #7 |
| Wilson, S | 0 | 56% | 0.9 | 112% | 91.0% | 2.3% | 98.0% | 9.50 | #1 tie |
| | | | | | | | | District | Rank |
| SE District Average | 6.43 | 5.71 | 7.14 | 5.71 | 6.43 | 7.14 | | 9.50 | #2 |

| | | Green | Yellow | Red | Weighting |
|---|---|---|---|---|---|
| #1 | Safety Performance: Rolling aggregate crew Days Away Restricted Duty and Transfer rate per 200,000 equivalent hours worked. | Less than or equal to 2.0 | Between 2.0 and 5.0 | Greater than 5.0 | 25% |
| #2 | Productive Wrench Time: Hours per shift of productive work time, exclusive of breaks, travel, and site prep, divided by total shift. | Greated than 55% | Between 45% and 55% | Less than 45% | 20% |
| #3 | Human Performance: Measured as Crew Caused Circuit Interruptions rate per equivalent 2000,000 hours worked. | Less than or equal to 3.0 | Between 3.0 and 6.0 | Greater than 6.0 | 15% |
| #4 | Cost Effectiveness: Average aggregate hourly labor rate divided by straight-time rate for all crew members, inclusive of OT. | Less than 110% of aggregate rate | Between 110% and 125% | Greater than 125% | 10% |
| #5 | Call-Out Rate: Crew member aggregate call-out acceptance rate, represented as a percentage according to automated call-out tool. | Greater than 80% acceptance | Between 50% and 80% | Less than 50% | 10% |
| #6 | Non-Conformance Rate: Number of non-conforming inspection items per WO as a percentage of total. | Less than 5% non conformance | Between 5% and 10% | Greater than 10% | 10% |
| #7 | Schedule Adherence: Construction complete on or before date schedule at start of 24-day scheduling process. | Greater than 95% | Between 90% and 95% | Less that 90% | 10% |
| | Numerical Score | 10 | 5 | 0 | 100% |

# Conclusion

# 04


**Figure 7: SAP's Analytics Cloud solution provides a robust framework to develop and deploy a myriad of operationally focused dashboards, metrics and scorecards.**

*SAP's Analytics Cloud is a powerful, cloud-based reporting and analytics engine. SAC combines BI, planning, predictive, and augmented analytics capabilities into a straightforward cloud environment. Powered by AI technologies and an in-memory database, it is a compelling platform for creating dashboards and Balanced Scorecards.*


Operational Excellence is imperative for utilities, many of whom face aging infrastructure and outdated technology. Increasing pressures from regulatory requirements, changes in the competitive market, and growing demand for consumer- friendly experiences demand changes in the utility sector.

A new way of thinking about network planning and capital assets is required to achieve Operational Excellence. These valuable enterprise commodities are the foundation of the utility. SAP Intelligent Asset Management meets the unique needs of utilities with network and asset lifecycle management that is e mpowered with robust master data management capabilities, advanced analytics, automation of processes, and mobile access.

Learn how Rizing's industry experts can empower your team to reach Operational Excellence.

Contact our Rizing industry experts today to find out how.

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