Oracle DataRaker
The Most Complete, Most Reliable Solution for Transforming Complex Data into Actionable Insight
Oracle DataRaker
Driving Action Through Insight

Oracle DataRaker unlocks smart grid data and turns it into actionable insight for electric, gas and water utilities. The Oracle DataRaker platform has unmatched depth and breadth of proven support for utilities’ most critical business areas. The rapidly expanding availability of smart grid data allows for powerful applications that extend far beyond meter data analytics. By recruiting and adding valuable context to these “sensors in the field”, Oracle DataRaker provides operationalized results and insights to help streamline business operations, reduce O&M, tackle data challenges and prioritize actions in a resource-constrained world.

Oracle DataRaker encompasses a broad portfolio of field-tested applications that leverage big data technologies such as Hadoop®, R, and the Oracle 12c Database. This powerful solution is combined with a results-driven deployment approach to deliver greater business insights with less risk than other alternatives. The pre-built, but extensible, applications address the needs of all business areas in a utility’s value chain and are designed to evolve over time.
Fig.1: Oracle DataRaker’s proven use cases that address the big data and analytics opportunities in the Grid, Meter and Customer business segments.
Applications Across the Utility Value Chain

Oracle DataRaker covers a breadth of functional areas and has been developed with a keen understanding of the underlying data structures and the business context it serves. The platform is delivered with a library of analytics for complex utility use cases.

The following is an introduction to just a few of Oracle DataRaker pre-built applications:

**Grid operations**

One of the largest areas of opportunity for meter data usage is in grid operations. Oracle DataRaker aggregates interval meter data according to the different nodes of the distribution system hierarchy. This offers a new and unrivaled view of actual load distribution and allows for improved forecasting, planning and asset reliability.

<table>
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<tr>
<th>Challenge</th>
<th>Solution</th>
<th>Value</th>
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| • Leveraging multiple data sources to produce timely insights on system and device performance  
  • Deriving comprehensive end-to-end insight across entire distribution network | • Analytics platform that reconciles transformer level data and smart meter data to monitor device performance and preemptively determine overload and predict failures  
  • Suite of tests that identify non-technical line loss/theft | • More efficient monitoring of existing assets  
  • Deferral of unnecessary capital expenditures  
  • Increase customer satisfaction from reduced occurrence of momentaries and outages  
  • Revenue protection from effectively identifying theft leads |
Meter and billing operations

Meters are the cash register of the utility. Failure of these devices to function properly can have significant consequences for financial performance and customer service. Oracle DataRaker continuously monitors for signature patterns that indicate defective or improperly configured meters. 24/7 screening yields prioritized lists of meters for field investigation or replacement before the issues can impact operations or billing. By relying on this monitoring to protect against lost or inaccurate data, utilities are able to reduce meter operations costs while improving billing accuracy.

Challenge

- Identifying meter malfunctions in an efficient and comprehensive manner
- Monitoring meter and network performance
- Maintaining meter data quality

Solution

- Suite of tests that identify meter malfunctions with prioritization based on client needs and resources
- Meter and network performance reporting dashboards
- Intuitive user interface to access results and perform data discovery on meter population

Value

- Improved operational efficiency for meter services group
- More accurate and comprehensive identification of meter operations
- Integrated continuous improvement in meter malfunction detection
- Efficient monitoring of meter device and network vendor contractual obligations
Demand Response and Energy Efficiency

Oracle DataRaker combines meter usage data with third-party customer and facility data to create targeted customer segmentations that utilities can use to recruit appropriate customers for pricing and energy efficiency programs. Using interval meter data, the solution directly measures program impacts without the need for supplemental metering or sampling. This is useful for program implementation activities such as baseline calculation, incentive payment determination, program cost-effectiveness evaluation, regulatory reporting, and measurement and verification.

Challenge

• Finding efficient methods to derive insights for program design, marketing and evaluation

Solution

• Custom reports to identify best candidates for program targeting and directional insights for design
• Ad hoc analytics to evaluate program performance and redesign

Value

• Action oriented insights help optimize results for all phases of a program’s life cycle
Safety

Oracle DataRaker has created multi-variate tests that focus on proactively discovering hazardous scenarios before they turn into critical issues. Oracle DataRaker uses advanced statistical methods to minimize false positives, and flags premises for urgent field investigation. This service has enabled utilities to minimize the risk of highly publicized meter fires and to identify spikes in gas consumption and water usage. Reduced safety hazards in the community, lower write-offs from unaccounted usage, minimized unbilled commodity usage and cost avoidance from damages and legal fees are some the benefits of proactively identifying these types of safety hazards.

Challenge
• Proactive monitoring of potential safety hazards related to commodity distribution services
• Reduce unbilled and unused commodity resources

Solution
• Customized analytics to monitor hazardous scenarios such as gas leaks, water leaks and overheating meters
• Intuitive user interface to access potentially hazardous cases and review related data

Value
• Improved community goodwill with a proactive rather than reactive approach to safety
• Reduced potential cost of damages
• Reduced write-offs from unaccounted commodity usage
Revenue Protection

With sophisticated pattern detection capabilities, Oracle DataRaker automatically identifies meter tampering and service bypass conditions associated with energy or water theft. The investigation process is then tracked for each case and lost energy and revenue is estimated. After theft has been mitigated, post-mitigation usage is monitored to verify that the problem has been resolved. The solution enables utilities to effectively protect their investments while reducing the occurrence of costly on-site inspections.

Challenge

- Identifying commodity theft and diversions in a cost effective and comprehensive way
- Keeping up with changing theft behaviors
- Creating documentation to support theft investigation and post identification reporting

Solution

- Suite of tests that cover the full range of theft methodologies including foreign meter detection, periodic full and partial bypass, and theft (usage) on inactive accounts
- Continuous algorithm refinement to keep abreast of changing theft behaviors

Value

- Reduced manual work in identifying theft leads
- Fewer false positive in theft leads
- Increased comprehensiveness in catching theft cases
- Identifying previously undiscovered theft scenarios
An Integrated Approach to Analytics that Adds Value Across the Enterprise

Oracle offers a wide choice of mission critical utility applications and technologies to meet the demands of the world’s leading utilities. Oracle has leveraged this deep understanding of core technology-enabled business processes to build a utility analytics platform that is unrivaled in its ability to leverage and enhance existing IT investments.

Strategic integrations between utility operational applications such as customer information systems, work and asset management and distribution management provide a number of benefits. Two-way data sharing enriches the collective data sets and improves information quality, resolution and accuracy. As an example, Oracle DataRaker’s monitoring agents allows existing transactional systems to focus on their core functionality, while the analytics platform continually scans datasets for outlier conditions. These results are passed to operational systems or work queues for further processing. In addition, Oracle DataRaker also provides a simplified interface for ad-hoc analysis which in turn enhances the transparency and reach of the information residing in existing systems. Figure 2 below highlights some of these strategic integrations along with examples of the use cases enabled by the two-way sharing of analytic insights.

Fig.2: Core utility systems are extended and enhanced through the data and insights that are shared between Oracle DataRaker and these existing applications. A robust integration architecture simplifies the exchange of information, whether on-premise or in the cloud.
Oracle DataRaker Platform: Scalable, Flexible and Integrated.

Data Ingestion and Data Model – Putting Complex Utility Data to Work

Oracle DataRaker solution transforms and aggregates data from a diverse set of utility and third party systems and unlocks the full potential of this data through a flexible but unified data model. The flexible utility data model enables the platform to ingest any new data type and integrate it with the existing data repository. In addition, the Oracle DataRaker platform is an extensible system that allows for flexible implementation approaches where clients have the ability to add new data sources as the utility evolves its analytics footprint.

Analytics Engine – Processing Power and Flexible Configuration

The analytics engine is comprised of a set of tools that ensure reliable, high frequency processing of data and delivery of results. These tools include operational monitoring, core data services, data visualization modules, and next generation closed loop business intelligence modules. This platform’s architecture allows for the configuration and validation of new algorithms at an unprecedented pace. Oracle DataRaker is the most reliable and high-performing system in the marketplace today.

User Interface – Pre-configured Library of Applications to Drive Actionable Insights

Oracle DataRaker provides an intuitive user interface that serves many types of business end user across all utility functions. The flexible user interface serves the needs of the super user community for the creation of custom analytics, yet remains simple enough for new users to navigate with minimal training. The analytic results are designed with existing business processes in mind and the structure and presentation of the analytical insights facilitates easy adoption into existing workflows.

Figure 3 on the next page highlights some of the core components of the Oracle DataRaker platform.
Fig. 3: The architecture of the Oracle DataRaker platform is designed to meet the performance demands of utility big data and the reality of rapidly changing utility business processes and operational systems. The flexible tools and data model allow for the incorporation of any type of information and the ability to create compelling analytics by seamlessly combining information from multiple sources.
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