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Business Process Services

White Paper

Achieving Business Excellence: Utilities Embracing Analytics for Effective Decision Making

About the Author

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Swaminathan has over 17 years of experience across various Finance and Accounting processes. He has worked in operations, quality, transition, client relationships, and global project management. As a global process owner, his expertise spans various record-to-report offerings and industry verticals. Swamy is proficient in developing solutions that bring together technology, processes, and functions, and working on transformation solution.

Abstract

How do we navigate today's tough business environment and the complex regulatory landscape? How can we transform the way we serve customers and support our employees? What is the best way to optimize asset maintenance and create greater value? These are some of the pressing questions confronting utility companies today. The answers to these tough questions lie in effective decision-making, which can be enabled by generating data-driven insights and making them accessible to all stakeholders within the organization.

Utilities need to create a systematic roadmap for integrating analytics across the enterprise, resulting in greater business value, increased customer trust and satisfaction, and improved profits.

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Introduction

The utilities industry continues to face significant cost and competitive pressures. Evolving regulatory changes and pricing policies necessitate improved service efficiency and effectiveness. Increasingly distributed power generation, the growing demand for energy efficiency, and the need for establishing personal connections with customers are forcing utilities to revisit their strained business models. Leveraging data and analytics in this scenario can help utilities reduce costs, improve efficiencies, and deliver superior customer service and engagement.

The Advanced Metering Infrastructure (AMI) deployed by utilities allows real-time gathering of energy usage data. Tapping into the humungous volumes of data generated by AMI and enhancing the availability of information and insights across the value chain can help utilities reduce operations and maintenance costs, increase energy efficiency, and enhance customer-facing and operations-oriented processes. Breaking the information silos across an enterprise and building a data-driven corporate culture is the way forward for utilities to achieve their business imperatives effectively.

Integrating and Operationalizing Analytics

Analytics opens up abundant opportunities for utilities to strengthen their businesses and customer relationships by supporting and enhancing metering operations, billing and call center services, demand management, and distribution operations and planning.

The way forward is to embrace a bottom-up approach to implementing analytics in focused business areas, and then gradually push for broader adoption across the enterprise. Utilities should also allow business users and needs to drive analytics solutions, and ensure that IT executes and supports systems relevant to each opportunity. Deploying solutions that yield quick ROI is another key imperative.

Utilities also need to adopt an open and collaborative approach to gathering, collating, analyzing, and leveraging data. This is possible only if all players across an organization have easy access to the right data at the right time to augment their decision-making.

Here is how utilities can adopt enterprise-wide analytics to achieve this goal.

Adopt pre-built analytical models and solutions

Traditionally, enterprise analytics was driven by IT. Business needs and objectives were often not adequately considered in the design of data warehouses. Today, we see a gradual move towards enterprises analytics solutions with pre-built functionality, data models, and use cases, including pre-built integration and data cleansing algorithms. Such solutions and models speed up deployment and reduce cost, while providing greater value to the business.

For instance, statistical methods such as Artificial Neural Networks (ANN) and Logistic Regression (LR) can be used to manage credit risk and identify early indicators of an impending default. Based on the results derived from the models, utility providers can adopt suitable strategies to approach their customers and minimize loss.

Leverage granular data

Sophisticated systems and granular data support decision-making in tough business environments. Utilities need to focus on gathering granular data, and aggregating and disaggregating it as needed to cater to the diverse requirements of different users.

For instance, advanced load forecasting solutions provide forecasts for individual premises, meters, and houses. The collated data can be analyzed using aggregation engines to improve forecasting and address regional transmission challenges such as data availability and management.

Integrate data from diverse sources

Utilities should use a reliable enterprise analytics solution that integrates data from different functions to provide a holistic picture. They also need to combine data from external sources to derive valuable insights across the value chain.

Effectively analyze enterprise-wide data

Providing seamless access to accurate data and information across the organization can result in utilities acquiring the following capabilities:

- Predicting revenue or load for substations or by rate tariffs
- Calculating the total P & L for a specific hour or day
- Analyzing usage patterns to understand the type of load on the system
- Evaluating load shedding opportunities
- Studying how demand-side management affects the system
- Funneling lower-level forecasts into operational systems

Manage and mitigate risk

A well-documented risk management strategy is key to ensuring compliance with data privacy and cyber security laws and requirements. Attention must be paid to creating, reviewing, and constantly updating the company's risk profile. Through risk planning, scenario mapping, and continuous monitoring of risk trends and events, utilities can proactively minimize and mitigate data related risk on an ongoing basis. Aggregation of data from internal and external sources is critical to gain vital insights and real-time guidance on risk exposures.

For instance, customer account information acts as a primary tool in identifying demand-consumption mismatch. Based on criteria such as consumption slabs, billing cycles, consumption area, and nature of consumption, data can be compartmentalized. Historical data combined with real-time forecasting can be utilized to identify outliers or huge anomalies. This practice can be applied for both commercial and residential meters, where meter reading and billing are conducted only in stipulated intervals. Anomalies including rudimentary methods of unauthorized energy diversion and unmetered current that fall outside the statistical norms can also be identified with analytics.

Making Analytics a Part of the Organizational Ethos

By drawing upon enterprise analytics solutions, utilities can establish a flexible and configurable data analytics environment. Defining clear metrics for gathering and analyzing data related to reliability, safety, efficiencies, and customer satisfaction, and sharing relevant information and insights with stakeholders within the organization should become a top priority.

Establishing centers of excellence allows employees to explore the various facets of analytics, and adopt innovative methods of delivering better results. The fundamental need here is to break down information silos and cultural barriers to fully leverage analytics, so that people make informed decisions as opposed to relying on intuition and guesswork.

Two aspects play a key role in the smooth and efficient adoption of analytics in an enterprise. They are:

- Business case: The analytics team must accurately quantify the benefits and ROI from analytics in order to win the buy-in of senior management for the sanction of adequate budgets.
- Change management: The team should also focus on creating a definite change management plan and strategy that hinges on collaborative efforts, and adopt a result-oriented approach that delivers anticipated results for defined challenges.

While leveraging data, utilities must also adhere to compliance mandates:

The European Union's data privacy regulation emphasizes that 'personal data must be adequate, relevant, and not excessive in relation to the purpose for which it is collected or further processed.'[1]

[1]Library of Congress, Online Privacy Law, European Union, (Nov 2014), accessed Nov 2014, http://www.loc.gov/law/help/online-privacy-law/eu.php

Selecting the Best Analytics Implementation Model

To implement a successful analytics program, utilities require sophisticated analytics portals and tools, a sound data model, and appropriate systems and processes for data extraction, preparation, validation

and analysis. A reliable technology platform is essential to implement data analytics in a safe and secure manner in line with business objectives. Third parties offer a range of end-to-end analytics solutions comprising advanced data mining and analytics tools.

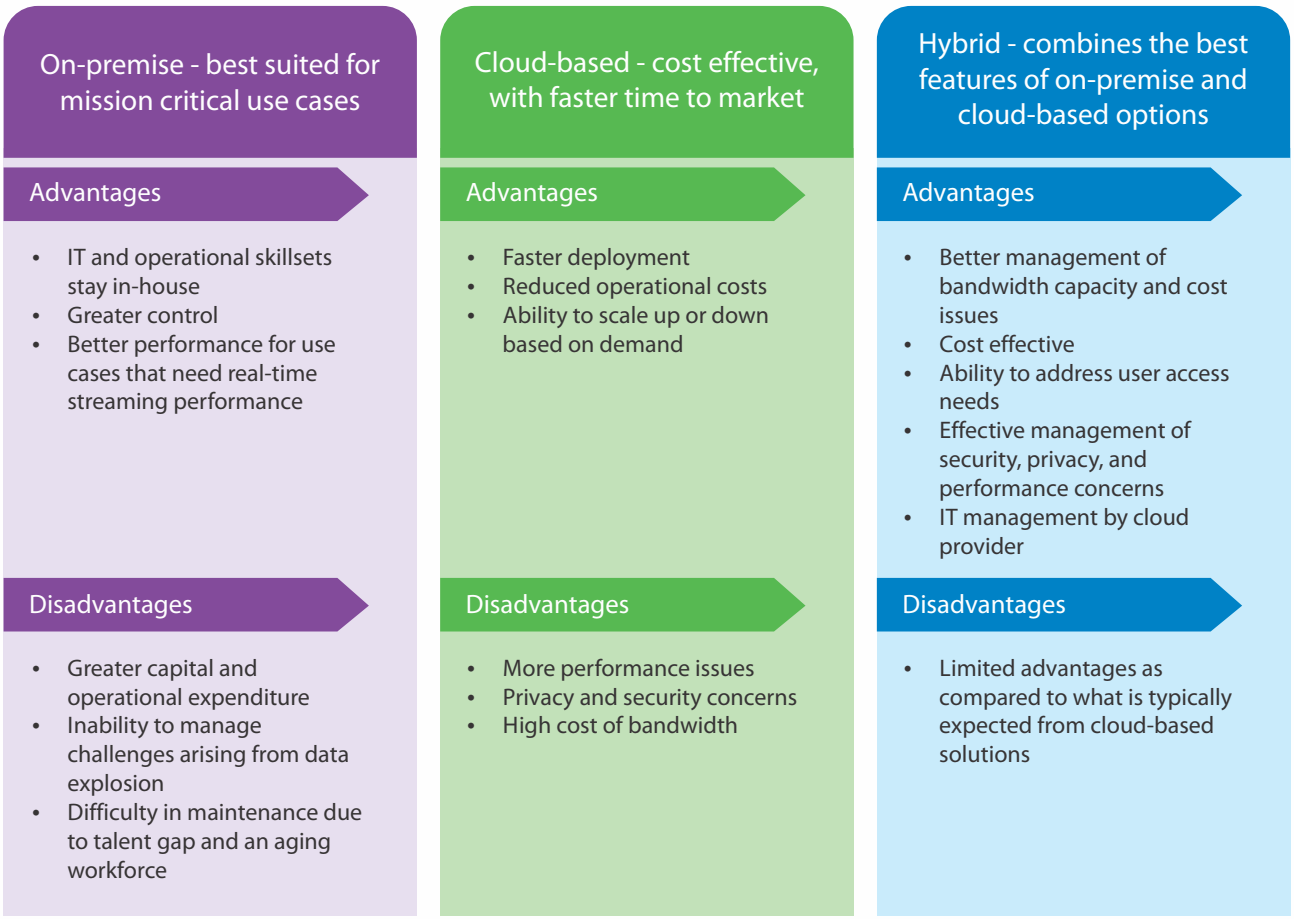

Figure 1: The advantages and disadvantages of the three analytics platform delivery models

Utilities can choose from three analytics platform models – on-premise, cloud-based, and the hybrid model. Figure 1 lists the pros and cons of each model. The specific requirements of the organization should drive the decision. Answers to a few critical questions will enable utilities to choose the most relevant analytics implementation model that suits their goals, budget, and business objectives:

- How mission-critical is the use case?
- Who needs access to information and how frequently?
- What is the cost involved?
- What are the anticipated results?

Utilities should also weigh the pros and cons of each model, as listed out in Figure 1, before making a decision. These best practices can help with the decision:

- Retain grid domain data and analytics on-premise
- Go for an enterprise-wide overlay approach
- Create an analytics strategy that factors in technology, people, and processes
- Engage with reliable vendors with excellent domain knowledge

Key Advantages of Embracing Analytics

Here is a look at four critical areas where analytics helps generate value.

Enhancing Customer Engagement

The key to superior, cohesive engagement with customers is a clear understanding of customer needs and usage patterns. Utilities can gain a robust picture of their customers through the following ways:

- Process millions of data points provided every year by Advanced Metering Infrastructure (AMI) to analyze and understand how customers use energy, and how they interact with the grid
- Integrate call center operations with digital solutions to enhance customer experience
- Customize interactions using a web or mobile application
- Leverage data from outbound marketing campaigns on how customers respond to emails and other communications
- Analyze customer-related data along with data provided by third parties on weather and demographics to gain a complete understanding of customers and their usage patterns

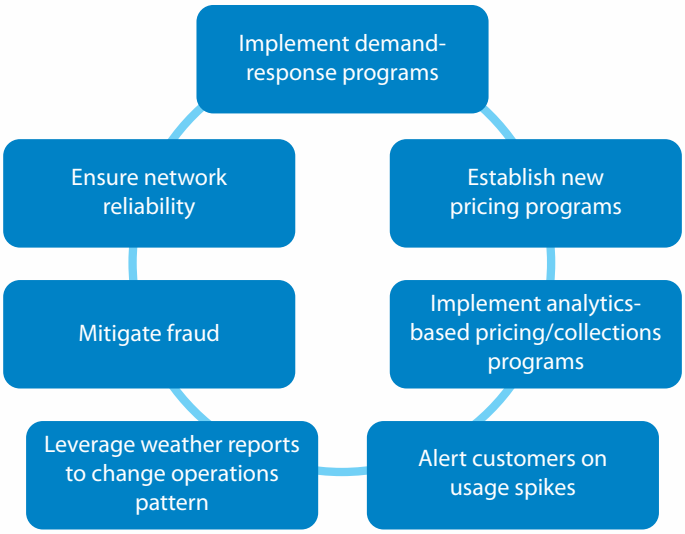

Figure 2: Deliver superior customer experience by leveraging analytics

By gaining comprehensive knowledge about customers, utilities can deliver several benefits, as presented in Figure 2. They can also improve public safety by analyzing usage spikes that might indicate potential leakage or an appliance disorder.

Implementing Effective Marketing Programs

Armed with in-depth information and insights from analytical tools, AMI, as well as customer segmentation data, utilities can plan and implement effective outbound communications on energy programs and services.

Personalized reports on energy consumption and detailed recommendations for achieving energy efficiency can be sent out to customers through their preferred channels. For instance, utilities can provide commercial small and mid-sized enterprise customers a normalized performance benchmark of their energy consumption compared to their peers. This is likely to motivate customers to optimize energy use and match or exceed the performance of their peers to reduce costs and improve their bottom line.

This will enable utilities in regulated markets to effectively meet energy efficiency requirements as mandated by regulatory bodies. Personalized campaigns also help boost customer trust and reduce churn in deregulated markets. In addition, with the right data on customers and their preferences, utilities can design compelling, cost-effective, and well-targeted campaigns that help in cross-selling existing programs and services.

Improving Operational Efficiency

By integrating analytics into business, transactional, and operational systems and processes across functions, including supply chain and HR, utilities can effectively cut costs and build an efficient and proactive enterprise. Figure 3 indicates a simple process to achieve this goal efficiently.

Readings from smart meters can be systematically utilized to make informed operational decisions. An analysis of the rich streams of data on intricate energy networks and assets provides a real-time view into system operations. Utilities can leverage this data to track and improve the health and security of the networks. Operational data analytics also offers utilities the ability to deploy and leverage resources more effectively to enable substantial savings on outage management, storm restoration, and asset and resource management. It provides historical as well as real-time views of a utility's operations that facilitate remedial actions wherever necessary.

By combining predictive analytics with operational data analytics, it is also possible to predict usage trends and forecast demand accurately. Utilities can make a paradigm shift in their approach to asset and outage management by better analyzing and predicting asset health, and effectively managing potential outages or leaks.

Here are some of the key operational benefits delivered by analytics:

- Improved reliability through continuous monitoring and proactive maintenance
- Enhanced operational efficiency and performance through better planning and execution
- Optimized resource utilization and increased revenue assurance by leveraging operational performance data from multiple sources across the organization
- Reduced infrastructure and asset replacement costs through proactive monitoring

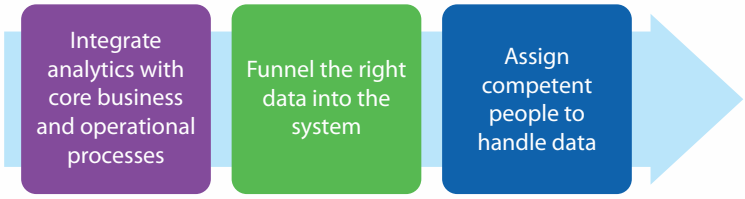

Figure 3: Follow a three-step process to maximize benefits from operational data analytics

Redefining Business Interactions with Stakeholders

An effective analytics program enables utilities to disseminate relevant information and insights to their key internal and external stakeholders including employees, customers, vendors, and regulatory and government bodies.

Utilities can provide information to vendors through comprehensive dashboards to help them benchmark themselves against their peers on metrics such as delivery schedules, billing accuracy, and cost benchmarks. In the same vein, based on the data reported by utilities, the government or regulatory bodies will be able to proactively manage their interaction with the organization.

Conclusion

As in the case of other industries, utilities are also witnessing a phenomenal explosion in data volumes. Large numbers of small renewable assets have been created in recent times to cater to the need for decentralization of supply, each generating voluminous data. Apart from sensors and monitoring equipment used for transmitting data, online smart meters and smart appliances are also adding to the data pile. Despite this, adoption of data analytics is still in its infancy in the industry.

However, far-sighted companies are leveraging analytics to address challenges such as customer service, outage management, asset management, and workforce deployment. They are utilizing analytics to build propensity models to evaluate and understand customers who are likely to participate in energy efficiency programs. Advanced analytics and modeling techniques are also being used in commercial and industrial segments to enhance customer satisfaction.

Recognizing the strategic benefits delivered by analytics, many companies are gradually closing their data analytics skills gap through targeted hiring, effective training, and partnerships with third-party service providers. While utilities chase their analytics goals with rigor, they must not lose sight of the data security challenge. Future data protection laws are predicted to become more stringent. Therefore, analytics strategies and programs must be clearly guided by well thought out and comprehensive road maps that include risk policies and processes.

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TCS Business Process Services (BPS) include core industry-specific processes, analytics and insights, and enterprise services such as finance and accounting, HR, and supply chain management. TCS creates value through its FORE™ simplification and transformation methodology, backed by its deep domain expertise, extensive technology experience, and TRAPEZE™ governance enablers and solutions. TCS complements its experience and expertise with innovative delivery models such as using robotic automation and providing Business Processes as a Service (BPaaS).

TCS' BPS unit has been positioned in the leaders' quadrant for various service lines by many leading analyst firms. With over four decades of global experience and a delivery footprint spanning six continents, TCS is one of the largest BPS providers today.

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