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Utilities and Big Data: Accelerating the Drive to Value

July 23, 2013

A Utilities Transformation Study
from Oracle Utilities



Contents

- Introduction 3
- Methodology 4
- Executive Summary 5
- Findings 6
- Our Take 18

Introduction

Oracle's "Utilities and Big Data" study is the second annual in a series examining how North American electrical utilities are using increasing volumes of smart grid data.

The 2013 "Utilities and Big Data" study picks up where the 2012 "Big Data: Bigger Opportunities" study left off: examining how utilities are using data to improve operations and the customer experience. Today, more utilities say they are completely prepared to deal with the big data influx, but most still grapple to manage, analyze and fully leverage the information.

The "Utilities and Big Data" study explores:

- Preparedness to handle the big data influx
- How data is being used to improve operations and customer service
- Future short- and long-term plans to use smart grid data
- The potential of cloud-based solutions for data management and analysis
- Where utilities will derive the greatest value from predictive analytics

The resulting report is based on the views of more than 150 North American senior-level electrical utility executives surveyed by Oracle.



Methodology

- Oracle conducted telephone interviews with 151 North American senior-level electrical utility executives in April and May 2013. The sample consists of 136 U.S. and 15 Canadian responses¹

Current Smart Meter Status

■ **29%**

Completed a pilot program

■ **24%**

Completed a partial rollout

■ **47%**

Completed a full rollout to all customers/service points

¹This report has a margin of error of $\pm 7.95\%$ at a 95% confidence level

Executive Summary

▪ The Good News:

- Utilities are making some progress in **preparing for the smart grid data influx**. More utilities say they are completely prepared this year compared to one year ago
- Utilities are accessing valuable data from a variety of sources in addition to smart meters, including **outage management systems, supervisory control and data acquisition (SCADA) history and customer data and feedback**

▪ The Opportunity:

- While utilities are using more data today, significant opportunity remains to harness data to improve grid performance and customer service. Less than half of utilities are using smart grid data to **improve customer service** today. Big opportunities also remain in **operational analytics** to improve asset performance, reduce operations costs, and improve network reliability
- Utilities expect predictive analytics will drive **operational efficiency** and boost the bottom line. **Seventy percent** of utilities said they expect predictive analytics to **improve revenue protection**, and **61 percent** said they expect it to **reduce asset maintenance costs**
- Most utilities lack sufficient **data analytics expertise**. Recruiting, training and third-party solutions can help close the skills gap
- **More than 80 percent** of utilities see potential benefits in **cloud-based solutions**. More than **a quarter (26%)** of utilities are either planning, implementing or maintaining cloud-based solutions for data management and analysis. Another **38%** are in the initial discovery phase

Utilities Are Improving, but Underprepared

- While almost twice as many utilities say they are completely prepared for smart grid data today vs. one year ago, **the majority still say they are underprepared**. Utilities report slight improvements in information sharing and strategic decision making

How would you **grade your utility's preparedness** to manage the smart grid/smart meter data influx?

Percentage who said completely prepared:¹

2012 – 9%

2013 – 17%

How effective is your utility in handling the data influx?

| Percentage doing an excellent job: ¹ | 2012 | 2013 |
|--|------|------|
| Putting timely information into the hands of people who need it most | 8% | 20% |
| Making strategic decisions based on the information | 4% | 11% |

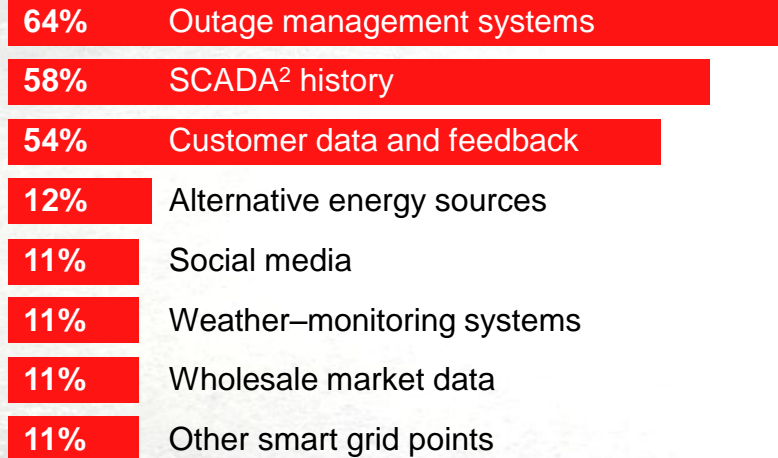
UTILITIES TAKE AWAY More Aggressive Analytics Approaches are Needed to Drive Significant Value

¹Those who rated their utility a 10 on a scale of 1 to 10, where 1 was very poor and 10 was excellent

Multiple Data Flows Contribute to the Influx

- 95% of utilities gather valuable data from sources other than smart meters. They have significant potential to harness data to improve grid performance and customer service

In addition to smart meters, which of the following data sources provide the most valuable information to your organization?¹

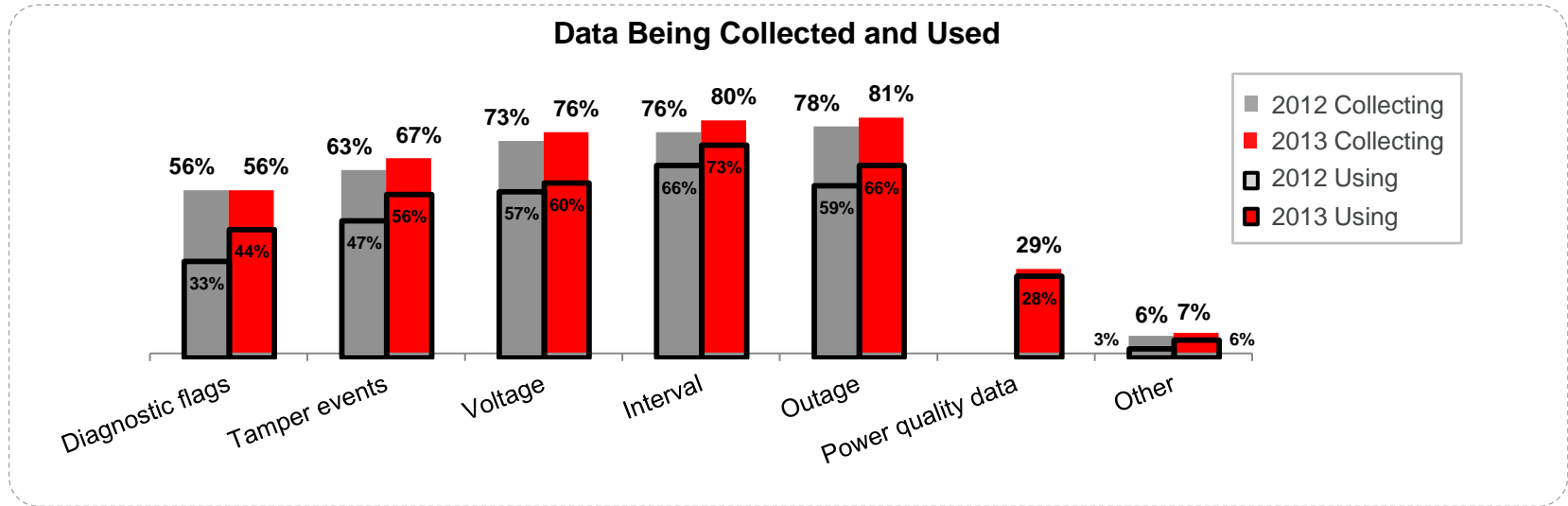


UTILITIES TAKE AWAY Utilities Must Look Beyond Traditional Information Sources to Significantly Improve Operational Performance

¹Respondents asked to name their top three additional data sources ²Supervisory control and data acquisition

Utilities Are Not Taking Full Advantage of Data

- Utilities collect and use slightly more information today than one year ago, but they still collect far more than they use.¹ Utilities have significant opportunity to do more



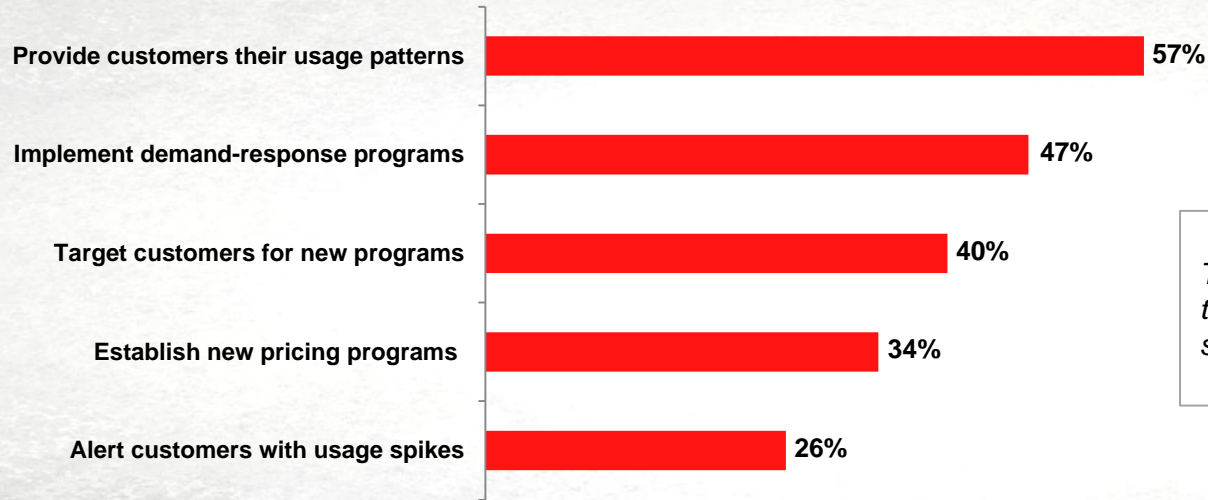
UTILITIES TAKE AWAY Utilities Collecting More Data Have the Greatest Value Opportunities

¹Some year-over-year changes are not statistically significant ² Power quality data response option was not used in 2012 survey

Opportunities to Drive Greater Customer Value

- Fewer than half of utilities today use smart grid data to provide alerts or make other direct customer service improvements

How are utilities leveraging smart grid data to improve customer service today?¹



The average utility has taken just **two** of these steps.

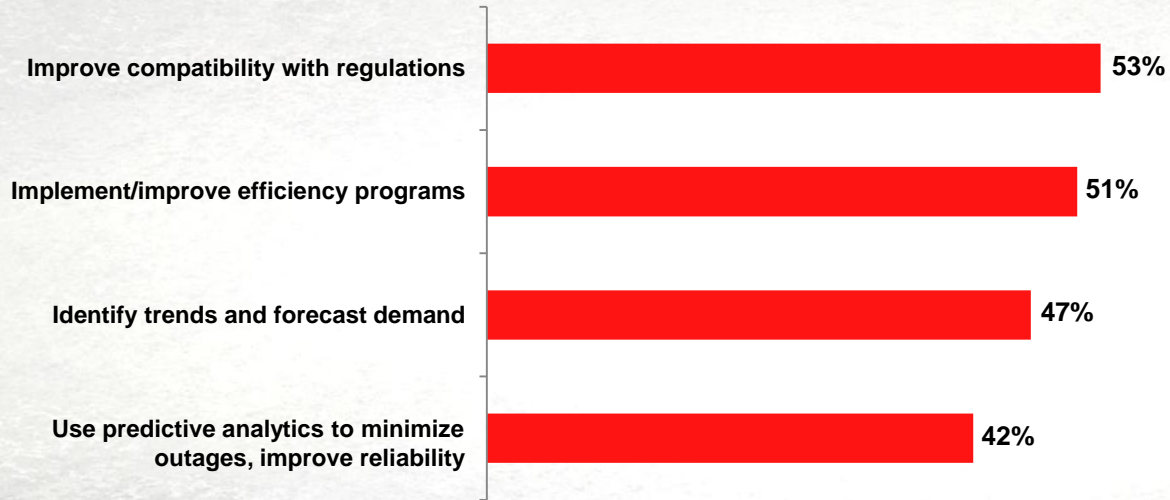
UTILITIES TAKE AWAY Use Data to Design Programs That Will Lead to Higher Customer Adoption

¹ Respondents asked to select all that apply

Opportunities to Drive Greater Operational Value

- Currently, just half of utilities are fully leveraging smart grid data to improve customer service through forecasting, demand management and improved reliability

How are utilities leveraging smart grid data to improve customer service today?¹



*The average utility has taken just **two** of these steps.*

UTILITIES TAKE AWAY Incorporate Predictive Analytics Capabilities to Drive Operational Value

¹ Respondents asked to select all that apply

Modest Incremental Transformation

- Utilities grapple with each step of the data review and reporting cycle, especially extracting data value

Percentage who gave themselves an “A” in the following measures:¹



UTILITIES TAKE AWAY

Utilities Must Look for Step Change vs. Incremental Improvement, to Take Analytics to the Next Level Now

¹Those who gave themselves a 9 or 10 on a scale of 1 to 10, where 1 was very poor and 10 was excellent; ² Did not ask in 2012

Necessary Expertise is in Short Supply

- Fewer than one in three utilities say they have sufficient expertise around smart grid data analytics or data science

Do you believe your utility has a **skills gap** around smart grid data analytics or data science?

62% Yes
31% No
7% Unsure



- *Utilities in all phases of smart meter rollouts are equally likely to have a data analytics skills gap*
- *Additionally, **58%** of respondents who gave themselves a **9 or 10** in overall preparedness see a skills gap*

UTILITIES TAKE AWAY Create an Action Plan for Internal Training and Emerging Collaborative Models to Derive Immediate Value

Skills Gap Requires Internal, External Remedies

- To address the skills gap, utilities are combining training and hiring with packaged solutions and third parties

Those with a gap:

Which of the following steps is your utility taking to address this skills gap?¹

Training our current employees



Hiring/building our internal capability



Investing in pre-packaged analytics solutions



Outsourcing analytics to a third party



Those that have closed the gap:

Which of the following steps did your utility take to eliminate or avoid this skills gap?¹

Training our current employees



Hiring/building our internal capability



Investing in pre-packaged analytics solutions



Outsourcing analytics to a third party



UTILITIES TAKE AWAY

Close the Skills Gap Through Recruitment, Training, Collaborative Models and Third-Party Solutions

¹Respondents asked to select all that apply

Many See Potential in Cloud-Based Solutions

- Two out of three utilities are considering cloud-based solutions for smart grid/smart meter data management and analysis

What is your utility's status regarding cloud-based solutions for smart grid/smart meter data management and analysis?

- 38% Discovery
- 7% Planning
- 11% Implementing
- 8% Maintaining
- 36% None of the above – we are not currently considering cloud-based solutions



Those planning, implementing or maintaining: What do you expect to see as the top benefits of your cloud-based solution?¹

- #1 Improved speed of service and application deployment (44%)
- #2 Improved information security (38%)
- #3 Increased flexibility/scalability to handle peak computing needs on demand (34%)
- #4 Improved data storage capabilities/capacity (31%)
- #5 Reduced IT capital expenditure (28%)

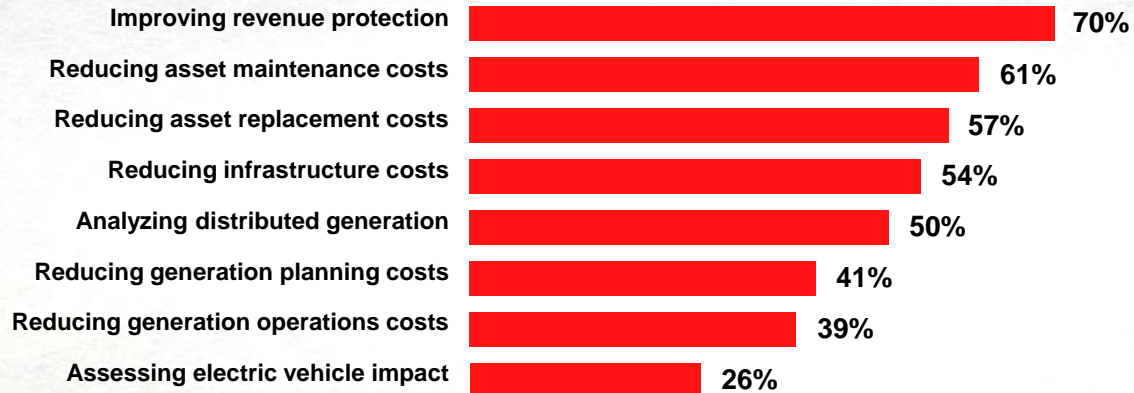
UTILITIES TAKE AWAY Leverage the Cloud for Growing Data Management, Collaboration and Analysis Needs

¹Respondents asked to select all that apply

Bigger Opportunities with Operational Analytics

- Utilities expect smart grid rollout and the corresponding implementation of predictive analytics to improve revenue protection and reduce asset maintenance costs

In what utility processes do you expect to achieve the greatest value from predictive analytics?¹



UTILITIES TAKE AWAY Become a Data-Driven Business to Improve Asset Investment Planning, Reduce Costs and Improve Network Reliability

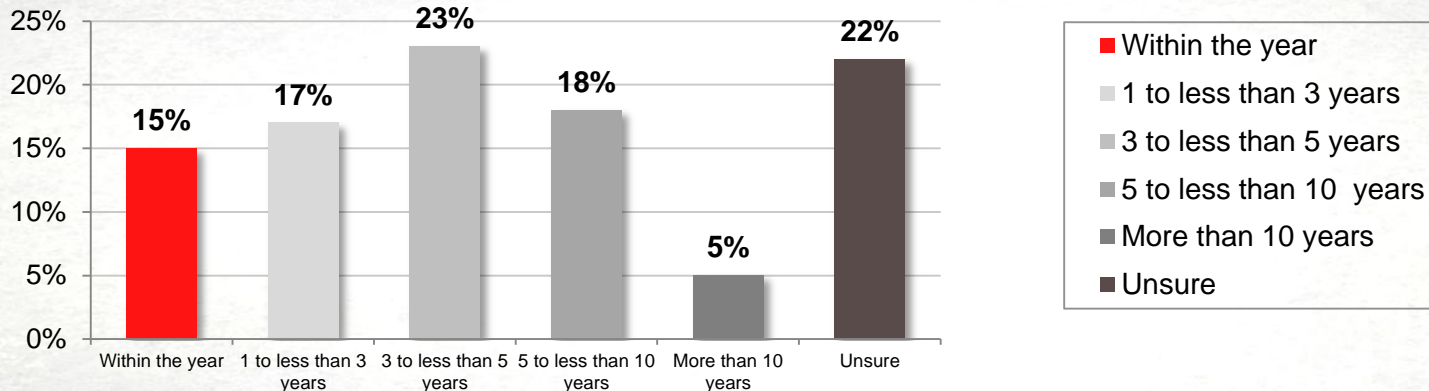
¹Respondents asked to select all that apply

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Positive ROI Expected From Analytics

- More than half expect positive ROI within five years. Still, 22 percent are unsure

How long do you think it will take your utility to realize a positive return on its smart grid analytics investment?



UTILITIES TAKE AWAY

Incremental Approaches Take Too Long; Utilities Must Consider New Approaches to Achieve Immediate Value and Return

Utilities Plot Short- and Long-Term Gains

- Smart grid infrastructure and data will enable more reliable energy, more intelligent usage information and custom pricing programs

The average utility with more than one million customers will invest approximately **\$180 million** in the smart grid and smart metering over the next five years

Short Term: Utilities' top three smart grid data plans for the next 1-2 years:

- #1** Compare historical data to **identify trends** and **forecast demand**
- #2** Provide **customers** with information about their **usage patterns**
- #3** Use **predictive analytics** to minimize outages or **improve service** delivery and reliability

Long Term: Utilities' top three smart grid data plans for the next 3+ years:

- #1** Alert customers of **usage spikes**
- #2** Establish new **pricing programs** (e.g., time variable pricing)
- #3** Use **predictive analytics** to minimize outages or **improve service** delivery and reliability

UTILITIES TAKE AWAY Grid Analytics Creates Near- and Long-Term Opportunity to Improve Utility Operational Performance

Our Take ...

- **We're Not Done with Smart Grid Yet:** Most utilities are not using their data as efficiently as possible. As a result, they are not realizing the economic benefits of analytics as quickly as they could be. Make strategic plans and get on board. The time is now.
- **Enhance Customer Value through Data:** Utilities should expand efforts to use smart meter and smart grid data to improve customer service and the customer experience. They should seize opportunities to make direct improvements today and, to build lasting relationships, ask customers what information would be helpful in the future
- **Use Data in Combination:** Utilities are collecting data from multiple sources. Combinations of data sources will deliver greater opportunities to improve reliability and customer service as well as reduce cost
- **Leverage the Right Talent:** Fewer than one in three utilities have sufficient expertise in smart grid data or general data science today. A three-pronged approach will help close the gap: recruitment, training and third-party solutions
- **Consider the Cloud:** Cloud-based solutions can improve the speed, security, and scalability of data management systems. As data volumes grow, so will the need for cloud-based solutions for data management and analysis



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