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Utility Financial and Operational Dashboards: From Prehistoric Reporting to High-tech Live Updates

Before the era of smart phones and instant messaging, information was difficult to come by and required manual, hands-on efforts to first gather the data and then process it to create some form of intelligence that could be used by decision-makers. This method was long and tedious, and a great deal of time could pass before a trend or emerging problem could be identified and resolved. In ancient times, the sign of a serious problem was usually when the well was dry or the color or taste of the water changed. Although to a degree the water industry may still rely on some customer feedback, utilities have made huge strides in developing early warning systems to monitor not only their water reliability and quality, but also their financial and operational performance. Financial dashboards have been called many things over the years, but the significance of their development has been the effect they have had on city councils, water commissions and boards, and citizen's committees. Financial dashboards are used for a variety of high-level reporting purposes, including rates and revenues, credit and financial metric monitoring, project and infrastructure tracking, and even consumer services and operational compliance.

EARLY COMPUTERIZED REPORTING

Edward Donahue III established the Municipal & Financial Services Group in Annapolis, Md., more than 30 years ago. The company's practice is to always provide a dashboard for the front end of every financial model the organization designs—whether it's a cost-of-service study, a system development charge study, a feasibility study, or an acquisition/sale study. The dashboard makes it easier for the client to use the model, sets forth the important assumptions that underlie the analysis, and typically includes graphic depictions of important findings, conclusions, or recommendations.

In the early 1980s Donahue first used a crude dashboard on an early-version spreadsheet for a California utility to make financial projections and develop various equations in an effort to resolve a dispute on water rights and rates. Using computers to report on utility finances and operations is a practice that today's financial managers could not live without. Competitive rate and fee calculation firms also have built several types of financial and rate models with dashboards. These models are used as a tool for budgeting and financial analysis to review the relationship between rates and revenues and provide the ability to play different "what if" scenarios. These rate and revenue snapshots are used by oversight boards and councils to demonstrate the relationships between various budget inputs and the resulting rate requirements. Financial models can also be used to optimize repair and replacement programs and prioritize capital improvement plans' budgets.

Digital dashboards have been around since at least the 1970s and today have many uses in a wide variety of industries, including financial management for water utilities.

Donahue explains that "to be an effective tool both engineers and accountants should have some level of familiarity of the dashboard and model. It is also important to not make the model too complex, which normally happens as different interests want more and more detail and features are added until the model no longer works. Like benchmarking, a utility should pick the top six to eight items that should be highlighted. Too much detail in any format also can make people numb with the data. The model feeds the dashboard and the dashboard feeds the model." For management and operational reviews, the dashboard offers a degree of simplicity and power and eliminates the need for burdensome reporting with hundreds of pages of texts and graphs.

RATE DASHBOARDS

The US Environmental Protection Agency has funded a number of financial dashboard reporting efforts through the 10 university-based Environmental Finance Centers (EFCs) established for each US Environmental Protection Agency region in the United States. One such dashboard for water, wastewater, and storm drain utilities was developed by Boise (Idaho) State University and can be found at http://efc.boisestate.edu/Tools/Dashboard/tabid/154/Default.aspx.

The EFC at the University of North Carolina (UNC)-Chapel Hill, has produced statewide rate dashboards for North Carolina, Georgia, South Carolina, and Virginia. Jeff Hughes, the EFC director at UNC explains, "One of the main objectives has been to help utilities' management and their rate approving officials to use the dashboards to compare user rates around the state in an effort to support any required rate increases in order to maintain their infrastructure and services." UNC-Chapel Hill has also developed several other financial and operating dashboards that can be viewed at www.efc.unc.edu/tools.htm#ratesdashboards.

CREDIT AND FINANCIAL METRIC MONITORING

Chief financial officers (CFOs) are always concerned with the local public and internal operational and financial stability, but also with the external scrutiny that each utility faces every couple of years when credit agencies review the creditworthiness of a utility. In an effort to maintain bond market access and lower capital costs (interest paid on borrowing), Jason Mumm, founder and president of Colorado-based Stepwise Utility Consulting, developed a financial planning toolbox called the Credit Scorecard. The financial plan model compares utilities' metrics against the published median benchmarks for Fitch Ratings' AAA-, AA-, and A-rated credit, and against Standard & Poor's strong, average, and low indicators. An example can be found at www.stepwiseadvisors.com/stepwises-utility-credit-rating-scorecard.

MEETING CUSTOMERS' NEEDS WITH HIGH-TECH REPORTING

In 1996 the District of Columbia Water and Sewer Authority (DCW, now known as DCWater) realized a major transformation needed to take place, and plans went into place to develop new ways of reporting on all aspects of the utility, including many performance indicators. Now the DCWater board is one of the best-in-class in its efforts to be both transparent and open to the public. The result has been sophisticated dashboards such as DCWater's Organizational Performance Dashboard, which was presented to the DCWater board of directors by general manager George S. Hawkins and the CFO Olu Adebo. An example of this dashboard may be viewed in the agenda of the board's February 2012 meeting at www.dcwater.com/news/publications/Board%20Meeting%20Package%2002-02-12%20rev2.pdf.

This dashboard combines the elements of financial highlights, consumer services highlights, low income assistance programs, and organizational highlights. The DCWater dashboard was specifically developed for the board with the board members selecting the top items they deemed important. In the area of billing and customer service, customer billing surveys are intermittently completed through focus group discussions about what can be improved. The low income assistance program that began in 2011 was able to be monitored closely and the lifeline even expanded during the onset of the economic decline. Similar dashboards are also used to present information to various management levels within the organization.

The operational highlights contain graphs and metrics to measure and report on regulatory issues and compliance—for example, lead concentration, excess flow, and total nitrogen—but go further to include recruitment activity, electrical use, water main leaks, sewer backups, and employee accidents. However, the model was developed to be flexible enough to add any new concerns that the board feels the need to monitor.

Adebo explains, "With cell phone technology and AMR [automatic meter reading], finance has the ability to monitor revenue and consumption on a real-time basis—two times daily—raising yellow or red flags along the way. Closely monitoring gives you a longer lead time to react to a situation that may need some kind of intervention. The 'bleeps' can be quickly addressed to the benefit of the utility and even to the individual customer that may have a new leak. Customers can also monitor their usage online and receive special alerts along the way."

Environmental Finance Centers have been established by the US Environmental Protection Agency at 10 universities, and one of these—Boise State University in Idaho—has developed a dashboard for water, wastewater and storm drain utilities.

CAPITAL PROJECT DASHBOARDS TRACK AND SAVE MILLIONS

The city of Aurora, Colo., with a population of 314,000, undertook a $754 million project known as the Prairie Waters Project (PWP) in 2005. The PWP employed more than 15 contractors for the design and construction of 34 miles of 60-in. pipeline that crosses multiple jurisdictions to transport water drawn from a vast series of wells, through three pumping stations, on to a new $200 million purification facility, and ultimately to residents.

Aurora Water Director Peter Binney devised the project when significant population and business growth coupled with a historic regional drought during 2002–03 threatened the survival of the city's water and left it with only a three-month supply. Completion of the first phase of the PWP in 2010 increased the city's water supply by 20%, yielding an additional 10,000 acre-feet of water per year. Capitalizing on South Platte River water rights already owned by the city, PWP innovatively captured water and return flows and now pipes them 34 miles to a new purification facility near the Aurora Reservoir where the water is treated and then distributed to Aurora Water customers. Aurora was faced with a unique challenge of managing the financial aspect of the project, which included significant water rate and fee impacts, bond-sizing and -timing, continued debt drawdown and investment, risk management, and credit ratings as well as the financial effect PWP would have on other capital improvement projects. The project included the financial challenge of increasing the utility's total asset value by a third in a short period. Although the city has an established

financial and accounting system, its capabilities are focused on supporting the internal needs of the organization and not managing projects.

A web-enabled reporting system was built on a database loaded with all of the PWP cost and schedule data from the various contractors as well as cost information provided from the city's internal accounting system. Hosted within the program's custom-developed online platform, the project control system (PCS) succinctly showed summaries and bid-package cost and schedule data via dashboards of easy-to-read metrics gauges, data tables, cost graphs, and scheduling Gantt charts. The result was a password-protected reporting and tracking system accessible from anywhere Internet access is available. The PCS enabled the development of a financial tracking and reporting system capable of providing an appropriate level of useful information to various stakeholders—project managers, the utility director, the CFO, and city management—so decisions could be made quickly and efficiently.

The consistent monitoring of PCS outputs during the construction between 2007 and 2010 allowed the CFO to create a budget plan, spending plan, and also a water rate–impact plan. The PCS drills down into the data, enabling the entire project to be parsed into bid-package summaries that allow analysis of the encumbrance and spending levels of each bid package, monitoring and updating of risk assessments, and tracking of change orders. As a result, cost savings could be pinpointed, and the overall project budget incrementally reduced, resulting in approximately $95 million in project-cost savings from the original approved budget. These cost savings ultimately resulted in lower annual rate increases for Aurora Water customers. Additionally, the PCS ultimately protected the encumbrance level of the utility, avoiding the unnecessary use of contingency dollars, which played a crucial role in passing along smaller rate increases to customers.

The PCS used the principles of project controls and earned value management, the use of which is standard practice for federal programs in planning budget, encumbrance, and cash flow projections as well as controlling costs through constant monitoring of cost and schedule performance presented through a web-based portal. The PWP contract awards were based on funding availability while monitoring individual bid packages. Funds were appropriated on both an annual and semiannual basis. As a result, adequate cash and bond proceeds were required to meet all encumbrance amounts in order to avoid prematurely issuing additional debt for contingency funding. This practice avoided higher rate increases while managing risks and potential cost overruns and provided the ability to accelerate some project-bid packages and appropriate additional dollars to meet new construction timetables. This could only happen as each project's financial risks were being evaluated (for example, using trenchless technologies to go under the South Platte River, freeways, and railroad crossings) in addition to monitoring and evaluating the project as a whole.

The PCS and dashboards enabled Aurora Water to manage multiple funding sources, adjust the time of the drawdown of bond proceeds, capture the best interest rates, and adjust project considerations according to current market conditions and risks balanced with the use of other funding sources all during the time of heavy financial market swings and a declining economy. Initial estimates placed the cost of the program at $850 million. This estimate was value engineered to the $754.8 million approved budget. The final costs of the PWP were estimated at $660 million expended over five years.

THE HUMAN TOUCH

Although financial dashboards can be helpful in communicating financial and operational data, utilities should continue to focus on teamwork and collaboration between reporting silos. Louisville (Ky.) Water Company's CFO Amber Halloran points out, "The human contact and collaborative effort should not get lost in the new wave of technology." Louisville Water has adopted an online business intelligence platform in which the project-proposal process is embedded into the business case analysis. The results of this process are reviewed by a capital project advisory committee comprising the utility's chief engineer, the CFO, a capital projects analyst, the head of utility planning, and a rotating member. Projects costing more than $100,000 are reviewed through the process; the capital budget is developed and passed to the chief operating officer and then to the board of directors. This process served the utility well through the economic challenges of recent years when swift coordinated efforts were required. During this time cash flows were monitored, and the committee worked together to stabilize the financial and operational conditions of the utility. As a result, bonds issued in 2009 will stretch into 2013 to cover prioritized items in the capital budget as part of the utility's 20-year capital plan. Halloran explains, "The collaborative effort is across all our organizations, we use the same books, the same numbers and the team is more unified and focuses on the right solution. Through this strong team process the CFO, chief engineer, and the head of planning are even present at bond rating presentations to demonstrate the strong management-team concept."

As technology improves, it seems that our collective appetite for additional information increases. However, as many utility finance experts have suggested, it is important to not get to the point of information overload in which the audience becomes numb to the important messages and to never forget that human interaction is what really creates collaborative problem solving teams. Robert Miller, deputy director of the Sewerage and Water Board of New Orleans, reminds us that staff members typically do a good job of measuring things, but it's important to make sure the data are well interpreted and that the critical questions—"What do the numbers mean?" and "What are we going to do about it?"—are asked. At the board level, dashboards must be turned into an action plan. As we continue to share our experiences and work and plan together, each utility will be able to discover the solutions to meet its unique operational, financial, and political circumstances.

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