

## **2010 NASCIO Nomination**

### **Digital Government: Government to Government (G to G)**

*Water Information System (WINS):*

*Improving the Efficiency and Transparency of Water Billing*

*State of California*

## **B. Executive Summary**

Nearly 19 million people live and work in the Los Angeles, Orange, San Diego, Riverside, San Bernardino and Ventura counties area – and they consume 1.7 billion gallons of water per day on average. Ensuring the adequate and reliable supply of this high-quality water in an environmentally and economically responsible way is the mission of the Metropolitan Water District of Southern California (MWD).

The MWD is a consortium of 26 cities and water districts (referred to as Member Agencies) and the approximately \$1.3 billion in annual water sales is invoiced using the Water Information System (WINS). WINS collects information from four systems (Automated Meter Reading, Supervisory Control and Data Acquisition, Enterprise Geographical Information, and the Oracle financials) to generate invoices based on water usage and certifications for each member agency and ultimately reports the collected data to the California State Controller's Office (SCO).

In the past, certification and invoicing for water lengthy and labor-intensive. Paper invoices were generated and mailed to the member agencies. Member agencies then reviewed the invoices, marked any necessary changes on the physical invoice, and faxed these change requests back to MWD for processing. Corrections were made, and corrected invoices were faxed back to the member agencies for their review and approval. It took as much as 45 days to process a monthly invoice.

In response, MWD analyzed the flow of information and determined that not only the collaboration model had to evolve, but also the enabling processes and technologies. As a result, the WINS application was rewritten to encourage collaboration between governmental agencies and partners, improve operational processes and technologies, and achieve a measure of transparency as to how water is being used and billed in Southern California. In August 2009, the revised WINS was made operational.

The new WINS transformed the collaboration. Invoices are now delivered electronically, eliminating manual errors. Self-service capabilities allow member agencies to view their water certifications and usage within the same month of billing. Invoices can be corrected immediately online, rather than waiting months for adjustments to appear. This affects member agencies' fiscal performance. Invoice processing time went from 45 to 5 days. Past invoice information is available online, and legally-approved electronic signature capability now allows member agencies to submit certified water transactions online via a secure Internet connection. These changes in WINS have strengthened the confidence in water billing validity and have improved relations between MWD and its member agencies.

## C. Description of Business Problem and Solution

### C.1 Business Problem

The old WINS billing system provided the ability to reclassify water usage and provide the billed agencies dollar incentives for taking part in approved water programs. This is called certification. WINS sent invoices to its 26 member agencies through a paper process that was time-consuming, labor-intensive, expensive, and was vulnerable to human error. It took up to 45 days to process monthly invoices. Paper documents relating to water usage, certifications, and wheeling (water transportation) charges were faxed back and forth between MWD and each member agency. Data was entered and reentered as the faxes traveled back and forth. This increased the opportunity for data entry errors. An additional problem was caused by the fact that billing logic was hard-coded into the program code, resulting in manual manipulation each month for each agency.

The challenges associated with WINS can be summarized as follows:

- There was a lack of confidence in the billing process.
- The billing process was not transparent.
- It took too long to process monthly invoices.
- There were too many opportunities for human error and it was not secure.
- The system needed more flexibility to handle changes in the billing rules.

### C.2 Business Solution

The solution to these business challenges was comprised of improving not only the computer software and technology, but also the invoicing process itself. A new billing system was needed to:

- Improve the relationship between MWD and its member agencies.
- Improve the monthly invoicing and water certification process.
- Improve the technology to support the revised process.

#### C.2.1 *Improve the relationship*

The WINS project provided an opportunity to improve and enhance the relationships MWD staff has with its member agencies. MWD used a collaborative approach to solve this business problem. The WINS team membership included customers, senior MWD management, consultants, and technicians. As part of the collaboration effort, member agencies assisted with the design and testing of the new water billing system, as well as providing and verifying requirements. Senior MWD management provided executive oversight and strategic direction, and technical staff and consultants used web-based technologies to develop and deliver the application. This collaboration technique was also used to determine the solution concerning data security. The initial design

proposed Juniper SSL for encryption, which required the member agencies to have current antivirus protection and security patches applied to their computers. Since many of the agencies did not maintain current licensing during piloting, the team met, and collaboratively decided to use an alternate option, which ensured security without impacting the member agencies.

Each member agency determined its training date for the new WINS application, and when it would cut over to the new system. This fostered a feeling of trust between MWD and each agency. The collaborative approach used during development and deployment resulted in an improvement in the overall relationship with MWD.

WINS ran in parallel with the old paper-based system for four months. This ensured accuracy and reporting validity. Only after the MWD and the agencies were confident in the new system was it made fully operational.

The improved WINS solution cost \$3.1 million to build and took 20 months to implement.

#### *C.2.2. Improve the process*

The second improvement was focused on the process improvement. The process of water billing itself needed to evolve. Since the WINS application is web-based, member agencies can access and certify their water types and usages from any computer platform. Faxing and photocopying is no longer necessary, as the member agencies have full online access to their information. This has drastically reduced rework and redundancy of effort and data. It also helps the MWD report its financial data to the California SCO.


Even the process of developing and deployment software systems was improved. The WINS team used best practices for systems development, which improved the quality of the end product. Requirements were obtained collaboratively, and the design and verification could be traced back to the requirements. Testing was performed by internal MWD staff, as well as final customer acceptance by the member agencies.

#### *C.2.3 Improve the technology*

The previous invoicing system was client/server based and had hard-coded logic regarding billing rates embedded in the code. Each month, the programs had to be manually changed and tested in order to produce water invoices for the member agencies. The new WINS application is a web-based .NET application that certifies water usage and rates, produces/delivers invoices, and provides reports on water usage for the general public. The information is presented in tabular and graphic formats that are clear, concise, and up-to-date. Each year 1.7 billion gallons of water flow through these meters, and the volume and rates are visible to the general public. Water usage is a major issue of interest to all inhabitants of Southern California.

**Hi/Lo/Avg Daily Flows & Volumes**

**Summary of Volumes by Meter**



Member Agency	From Date	To Date	Meter
SD	02/01/2010	03/01/2010	SD-01A

Meter ID	Meter Date	Hi Flow CFS	Lo Flow CFS	Avg Flow CFS	Meter Vol AF	Max Penalty	Min Penalty	Total Volume
SD-01A	02/01/2010	20.00	16.7	18.73	37.1	0.0	0.0	37.1
SD-01A	02/02/2010	17.78	13.3	16.40	32.5	0.0	0.0	32.5
SD-01A	02/03/2010	21.11	12.2	17.49	34.7	0.0	0.0	34.7
SD-01A	02/04/2010	21.11	13.3	16.42	32.6	0.0	0.0	32.6
SD-01A	02/05/2010	14.44	13.3	13.74	27.2	0.0	0.0	27.2
SD-01A	02/06/2010	14.44	13.3	13.78	27.3	0.0	0.0	27.3
SD-01A	02/07/2010	14.44	0.0	8.44	16.7	0.0	0.0	16.7
SD-01A	02/08/2010	0.00	0.0	0.00	0.0	0.0	0.0	0.0
SD-01A	02/09/2010	0.00	0.0	0.00	0.0	0.0	0.0	0.0

WINS receives usage information from four other systems (Automated Meter Reading, Supervisory Control and Data Acquisition, enterprise geographical information, and the Oracle financials). This ensures that the invoices are current and accurate. To provide added security, a security schema was designed and implemented that involves a firewall, placing the web server in the DMZ, and VeriSign certification. This replaces the manual faxing and re-faxing, and the questionable security related to that method of information sharing and communication.

#### D. Significance of the Project

The significance of the WINS project was to *improve and streamline the operations of government*. Upon completion, it helped MWD meet a strategic priority of *improving reliability, security and efficiency*. It also meets the customer goals of *increasing satisfaction and improving coordination of water delivery and billing*. This supports the long-term goal of public participation and support for water conservation and is in line with supporting the *Governor’s special legislative session on Water*.

Increasing the accuracy and timeliness of water invoicing allows both the member agencies and MWD to exercise more control over their budgets. Monthly labor costs associated were reduced for both MWD and its member agencies. Invoicing transactions are now done electronically, rather than with paper invoices, which decreases the cycle time and amount of paper consumed. Collaboration during the development and deployment of WINS improved the relationship between these government entities.

Public transparency of water rates and consumption was another important achievement for the WINS project. The public can view current and historical information about the activity and usage of water in their area by their water agency. When the public is knowledgeable about water usage, they are more supportive and more likely to practice water conservation.

## **E. Benefits of the Project**

The benefits achieved from implementing WINS can be seen from three different, yet converging, viewpoints: that of the member agencies, MWD, and the general public.

WINS aligns with NASCIOS's priorities of *Budget and Costs Control* by reducing system operating, data entry, and printing costs; *Transparency* by making all data available to its customers online in a prompt and easy to understand format; and *Security* by eliminating the "human" process in the billing cycle. It aligns to the OCIO's strategic priorities of *IT as Reliable as a Utility* by implementing a web-based solution that is available to all its members; *Self-governance in the Digital Age* by allowing members to access WINS regardless of their operating systems or configurations; *Information as an Asset* by providing 30 years of water billing data online; *Economic and Sustainable* by implementing a paperless billing process; and finally *Facilitating Collaboration that Breeds Better Solutions* by using collaboration throughout the lifecycle to not only create a better product but improve the relationship between MWD and its members.

### **E.1 From the member agency viewpoint**

There are major benefits WINS provides our member agencies. The first benefit is that each agency is better able to manage their budgets. Due to the significant reduction in invoicing processing time, and a significant increase in data accuracy, the invoices are more current and reflect true consumption and certifications. This, in turn, improves the member agencies' confidence level of the billing process. Art Valenzuela, the water administrator from the City of Tustin said, "[WINS] is easy to use and understand. It's a great time saver." Jeffrey Stalvey, from The Municipal Water District of Orange County, said that WINS "is very user friendly, comprehensive, and has streamlined the certification process." Carolyn Rynda, the water administrator from the South Coast Water District, said that "WINS will save a lot of time and paper."

If a change to the data is necessary, it can be made and verified within minutes, instead of weeks. The entire billing process was cut from 45 days to 5 days; a 90% reduction in processing time.

Another benefit is that traceability and accountability of water usage and certifications have improved, which assists them with any internal audit or oversight activities.

### **E.2 From MWD's viewpoint**

In addition to the benefits enjoyed by the member agencies, MWD also benefits from the flexibility of its technical infrastructure. The new platform is more robust, agile, maintainable, and able to evolve with changes in the billing structure and rules. This reduces MWD support costs while allowing options for using the new infrastructure to support the next generation of applications. This allows MWD to provide and support

systems in a more economical manner. Some examples of annual savings MWD has realized are:

- \$468,000 through the streamlining of invoice processing
- \$43,200 from the reduction of mail services
- \$312,000 from the reduction of invoice preparation
- \$54,264 from the reduction of fax, invoice and forms paper use

In addition, confidential or sensitive data are protected through secure and proven technology that is not dependent on frequent human intervention.

MWD's use of a web-based application ensures that the user can access the application regardless of operating systems or configurations. The new application is rules-based, so hard-coding of billing parameters is no longer required.

### **E.3 From the public viewpoint**

The public also benefits from the implementation of WINS. People can see operational data regarding water usage via the Internet. This allows the public to hold their public utilities more accountable, and bolsters the public faith in their local water agencies.

The relationship to the general public was also improved by the delivery of WINS, thus contributing to governmental transparency. WINS provided a method for members of the public to view operational information about Southern California water usage via the Internet. Through this web portal, the public can view up to 30 years of water usage, water rates, and water sales information.

### **E.4 Summation**

The WINS project was a great example of improving government-to-government transactions digitally. There was a 90 percent improvement in processing time, a reduction in paper usage, an increase in security, and an overall improvement in the relationship between government entities. Invoices are now sent electronically, and are reconciled quickly. Current and historical reports are also available via the Internet. WINS enhances intergovernmental collaboration and transparency. It helps the member agencies be more fiscally responsible and helps the public be more aware of a critical resource that needs to be conserved.