

Web-Based Integration Streamlines Processes

Truckee-Donner PUD integrates disparate IT tools to provide collective value.

By **Ian Fitzgerald**, *Truckee-Donner Public Utility District*

Although electric utilities may delay, time will not. Today, it is not about inventing new technologies; instead, it is time for a utility's individual information technologies to be unified in a single system, integrating each technology's unique capabilities. On their own, many of today's technologies provide useful functions to the business environment:

- Business intelligent (BI) software can mine many types of data storage and display meaningful data and charts in real-time dynamic dashboards.
- Business process management (BPM) software has the ability to organize data workflow, applying rules and roles that define how and when information moves through a cyclical process.
- Geographic information system (GIS) software is capable of defining spatial relationships between people, places and

time using geo-processing abilities to find complex associations no other software has the means of recognizing.

Now it is possible to take service-oriented architecture (SOA) software and integrate these widely disparate applications within a single Web-based environment. The result is a valuable tool with a vast number of functions and abilities that no consumer off-the-shelf enterprise resource planning software can match.

California Electric Regulatory Compliance

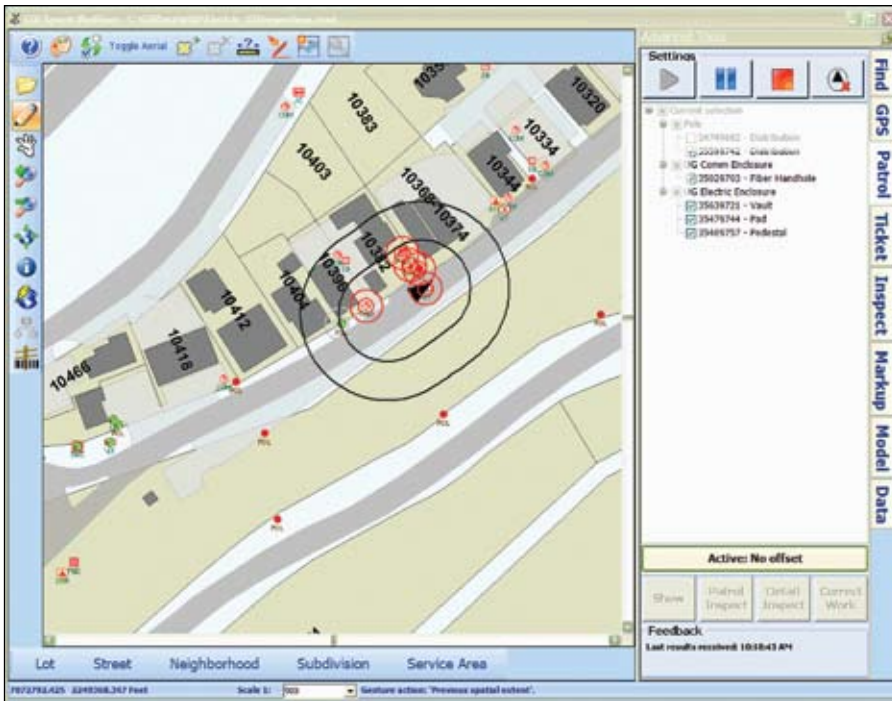
Truckee-Donner, a public utility district located north of Lake Tahoe, in Truckee, California, U.S., decided to think outside the box when trying to tackle a complex business requirement. Like all utilities in the state of California, Truckee-Donner has an obligation to its ratepayers to operate and maintain a safe electrical environment. This means that every electrical facility must meet, at a minimum, the construction standards laid out by State General Orders 95 and 128.

To accomplish this, Truckee-Donner must perform yearly patrol inspections of every facility (currently more than 12,000 and increasing), detailed inspections every five years and intrusive inspections of electric poles every 10 to 25 years. For each and every facility, Truckee-Donner is required to document when an inspection is completed, who completed the inspection and what, if any, conditions were found that need correction.

When conditions calling for corrections are identified, the utility must maintain a historical paper trail, describing how long it took for the condition to be corrected, who corrected the condition and what work functions were performed to facilitate the rectification. Utility staff must be



Recovery from significant storms is, in addition to being serious work for linemen, a considerable exercise for the supporting IT systems.



GPS-enabled software automatically assigns a "passed" status for patrol inspections of facilities that are within sight of a vehicle.

able to access this data accurately and at a moment's notice.

Now imagine doing all of this with only 10 staff members, part time. The staff also does all-new construction, outage-management response, tree-trimming management and facility upgrades, among other duties — a lot of work for such a small amount of available resource.

Solution of Making Technology Work

In order to improve on its past work environment in which the utility had one full-time employee manually documenting every condition, in poorly accessible paper binders, Truckee-Donner decided to let technology automate a majority of the documentation, notification and reporting of every inspection. Knowing that no one software had the ability to accomplish everything the utility wanted to achieve, it turned to merging individual technologies, bringing together a vast number of abilities that can feed and build on one another, making the

time inspecting facilities and much less time entering data.

Now, as a vehicle passes within a configurable distance of 90 ft (27 m) of a utility pole or 25 ft (8 m) of a utility underground structure, the system automatically assigns a passed patrol inspection, containing the facility identification, date, inspector name and status of "no conditions identified" to every facility.

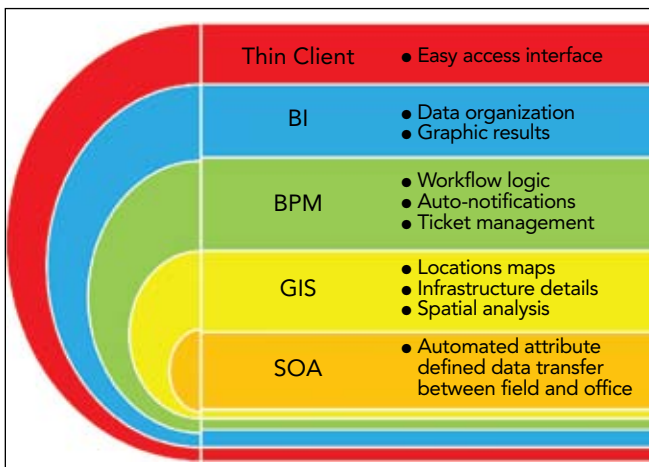
For facilities where conditions are found, the inspector selects the faulty facility and changes the status to a priority-one or priority-two condition-found status, allowing for correction work to be followed up in a timely manner. Previously, inspected facilities were marked as completed and never automatically documented a second time for the year, but could be manually documented if required.

Sorting Through the Inspections

More than 100 records per inspector per hour is a lot of records to sift through in a short amount of time. In past field documentation setups, this data often had to be filtered through database tables, cryptic and unreadable to the untrained user. Truckee-Donner, again understanding the limited resources at its disposal for such a menial task, needed a software interface that made deciphering the data quick, easy and sensible. Enter technology like BI, BPM, GIS and thin-client Web interfaces.

Using a well-known technology like a Web browser, Truckee-Donner provided a software interface to the user that was instantly recognizable and unthreatening. Running BI, BPM and GIS engines behind the browser, the mined data is now well organized and easily decipherable, whether in a graph, table, map or report. Diving deeper into the data is as simple as mouse clicking on a graph or table entry.

A user can click on a ticket status and bring up the num-



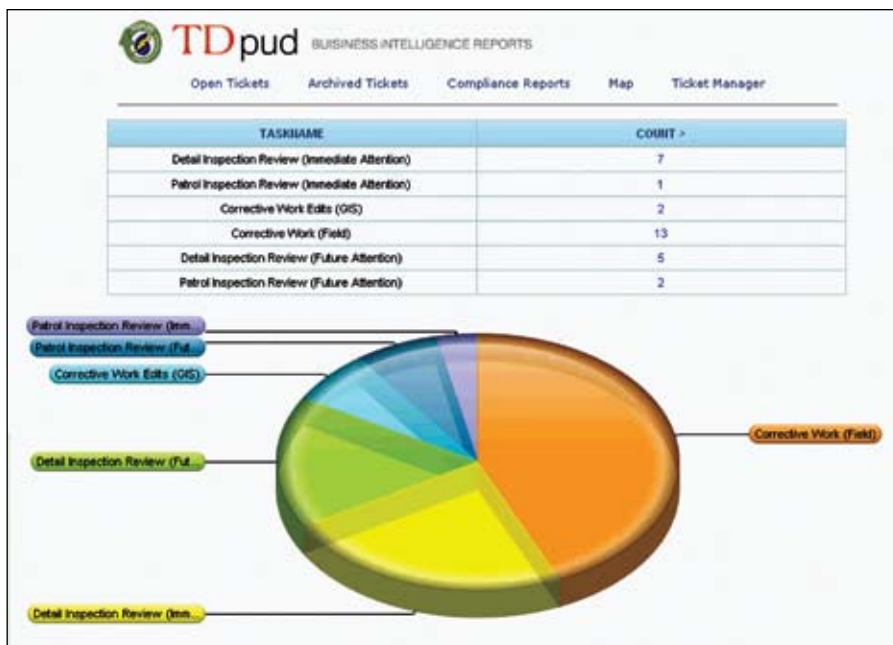
By combining technologies, each can bring a unique component.

ber of tickets assigned to each user, then view tickets assigned to individual users, access the history of that ticket, map the location and, finally, assign an outstanding ticket to a utility crew as a work order. The final interface design provides the maximum amount of data with a minimum amount of effort and is only accomplished through the combined effort of multiple technologies running behind the Web browser.

Managing the Work

As important as it is to have a simple, clean and functional interface for office staff, it is equally important to have a similarly well-designed interface for field personnel. Considering tens of thousands of inspections are performed yearly, it is more than conceivable that hundreds of those inspections will result in work orders assigned to field crews for rectification.

As a result, Truckee-Donner again applied the notion of harnessing multiple technologies to simplify the task of its crews in identifying tickets assigned to them, understanding



Data mining with separate BI, BPM and GIS engines helps to organize and provide accessibility to the data.

what state those tickets were in (priority one or two), showing geographically where those tickets were located and making vehicle-routing abilities available to minimize travel time to those work orders.

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One of the biggest benefits gained by merging multiple technologies together is how easy it is to make changes after the project begins. Because most of the technology applied by Truckee-Donner is configurable, without the need for software coding, altering the program by adding a process stage, removing a retired employee or modifying the information recorded on a work order form takes under an hour to develop and deploy. Since it is inevitable that a project will evolve after it begins, this functionality was critical in the program's development. It also became apparent how easy it would be to transcend a general order inspection program to other business cases within the utility, like vegetation management, meter replacement, leak identification and repair, and outage damage assessments, to name a few.

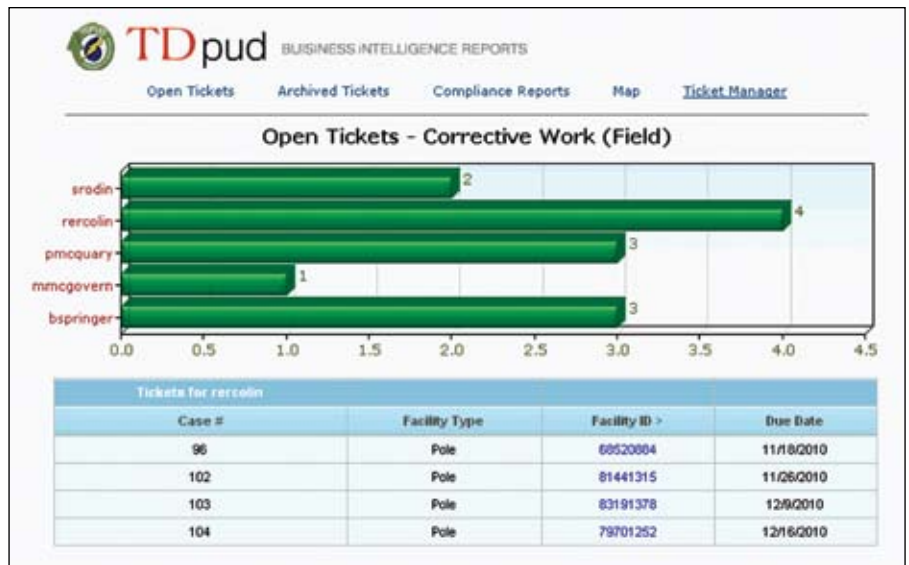
Ready for the Questions

As hard as every utility tries to maintain and operate a safe electrical system, inevitably there will be occasions when these efforts are called into question. Be it something as minor as a television breaking as a result of a power surge or as significant as a loss of life, not only having the ability to know the utility has done everything in its ability to maintain a safe environment, but also being able to prove it is critical when questions to that effect start getting asked.

Truckee-Donner ensured this was possible by combining one-click data review and analysis of all inspections ever collected within this program, using BPM and GIS for the historical record archiving of individual locations and a BI engine as a front-end reporting tool. Be it a canned report showing the number of conditions identified by facility equipment, determining the number of priority-one conditions discovered for the month, or reviewing the entire inspection and rectification history of an individual facility location, the utility can quickly and easily prove it is working to maintain a safe electrical environment each and every year.

A Complete System

The resulting system Truckee-Donner implemented encompasses a complete cyclical workflow that includes the ability to document, review, manage and report every general order condition and rectification in the life of a facility. Underneath the hood, the program can be deemed vast and complex. This might be true for most, but for an IT professional, the management and configuration of the system is straightforward and simple. The power of combining the technologies is in both the ability to let the technologies automate much of the work and, at the same time, provide a simple, easy and sensible interface for non-technical users. It is these users that can make



With BPM software, a workflow can be customized for every business process imaginable.

or break a software system's success in a utility.

Truckee-Donner's original perception was to take advantage of differing technologies, unifying them into a system that takes much of the mundane work out of the user's hands and moves it into high-tech automation. The result is a system that has proven to do this and a whole lot more. It is no longer a viable option to spend tens of thousands of dollars for software to sit on an island and be content to work within its own abilities. Technology must learn to work together, each combining its unique capacities, to complete a business environment that is truly whole. TDW

Acknowledgment

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Companies mentioned:
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