1 Hydro Utility Automation Using Fortech's A2S Model

Executive Summary

The client is a consortium of 26 cities and water districts that provides drinking water to nearly 18 million people in parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino and Ventura counties.

The mission of the company is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way. The Company currently delivers an average of 1.7 billion gallons of water per day to a 5,200-square-mile service area.

Company:
The client is one of the largest Water & Electric utility services providers in S. California.

Solutions:
- Fortech's A2S Model
- ForTag (Fortech's E-Tag)
- Power Management System
- Fortech's Consulting Services

Industry:
Water/Energy/Utility

Challenge:
Analyze & Automate various disjointed manual processes into an integrated web based solution.

Apart from providing water to its clients, the client has hydro energy generation stations at various locations. All together, they have 16 Hydro Energy Generation locations with a total generation capacity of around 140 MW. The energy generated is sold to various customers based on long-term contracts that the company signed with them.

Fortech was awarded the contract of providing the client with a completely automated, integrated web based solution that will dramatically enhance the efficiency of the daily operations and also provide the company with a long term solution that supports their future requirements using **Fortech's Analysis to Solution Model** (Fortech's A2S Model).

The solution proposed and delivered by Fortech also facilitates open, seamless communications between all systems involved in the process, and has allowed the company to accommodate a rapid increase in trading activities.

Problem:

The client's problems included performing day-to-day activities, which involved scheduling, transaction management, accounting & billing function using disjointed and multiple manuals processes, which were inefficient, and error prone. The client was looking for an enterprise web based solution to overcome the issues.

Solution:

A combination of Fortech's consulting services, automation of existing systems and processes, and utilizing Fortech's A2S Model to create a highly reliable mechanism to create a new integrated Web services infrastructure to handle energy transactions.

Results:

The integrated solution went live on time, on budget and has had no failures. Benefits include increased efficiencies, elimination of manual processes, elimination of multiple data entry's and the ability to handle a marked increase in the quantity and frequency of transactions with a clear visibility into details.

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CASE STUDY DETAILS:
About Fortech:

Fortech provides utility related software solutions and services. As part of its Custom Application Development Services, Fortech also provides Business Process Re-Engineering & Modeling and Web Services Infrastructure Development. Fortech's solutions make it easy for enterprises to build, deploy, manage, and secure reliable web services & applications for the Utility Industry. Fortech has about 75 employees and is headquartered in Tempe, AZ.

OVERVIEW

BUSINESS PROBLEM

Providing a highly Reliable and Efficient Mechanism to Track and Manage Energy Transactions:

The company is one of the largest hydro utilities. The company owns, manages or has a financial interest in various federal hydro resources and has hydro energy generation installations on these resources. Energy is produced as a by-product of the water flow. The company's operations are performed from various locations serving various functions, such as, energy trading, scheduling, accounting and billing. Energy trading is a core requirement for the business, and is heavily regulated. Most of the energy generated off these plants is scheduled based on long-term contracts the client has setup with its customers. A normal business process flow would be as below:

- **Real Time Scheduler:**
  - o Receives requests for water
  - o Performs manual calculations based on business knowledge
  - o Enters forecast generation in Excel sheets
  - o E-mails the Excel sheet to the Pre-Scheduler

  In real time, the Real Time Scheduler also keeps track of the customer schedules and energy generated

- **Pre-Scheduler:**
  - o Copies schedule from the forecast sheet received from the Real Time Scheduler
  - o Creates & saves a new Excel sheet for each customer massaging the forecast schedule
  - o E-mails the Excel sheet to the corresponding customer, back to the Real Time Scheduler and also to the accounting department along with NERC E-Tag sent to appropriate parties.

  After the fact, the Post Scheduler imports all meter data from CSV files and manually calculate the deviation. The meter data Excel sheets including deviation sheets are also emailed to the accounting department.

- **Accounting:**
  - o Perform accounting using Excel sheets using variables based on business knowledge
  - o Generate accounting reports manually
  - o Send emails with invoice data as Excel sheets to billing

- **Billing:**
  - o Validates the invoice data received by email
  - o Generates individual invoices by customer
  - o Invoices sent to the customer

Disadvantages of existing system:

- In-efficient manual processes

- Multiple data entries

- Prone to unforced human errors

- Substantial effort & resources to perform reconciliation

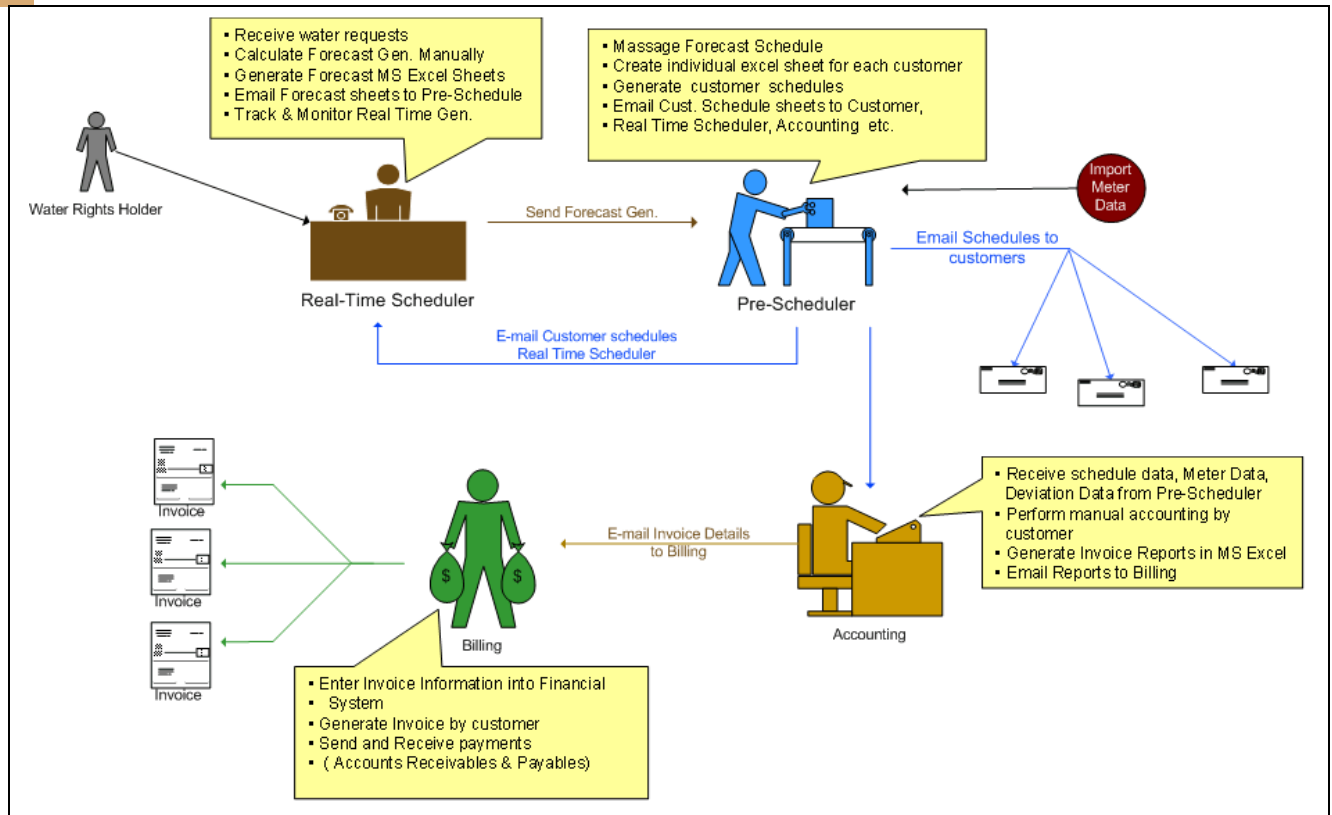- Accounting involved manual report generation etc.

Figure 1:
Existing Process before Fortech A2S Model

FORTECH'S SOLUTION

FORTECH'S A2S MODEL

The company recognized that it needed to find a partner for the project that could provide services, to analyze both the existing business & functional processes, model & perform business process re-engineering, propose a solution with enhancements and also design, develop and implement an enterprise solution based on the enhancements. The partner also needed to be flexible enough to provide on-site consulting support, plus 24/7 offsite support as needed, all on a short deadline. Figure 2, shows a simplified schematic for the chosen solution proposed using the Fortech's A2S Model.

After a detailed review of the proposed solution, the company has approved Fortech's solution. Fortech has designed, developed and delivered an enterprise class integrated system which provided the following advantages:

- Eliminated manual communication process completely such as emailing Excel sheets & phone calls
- Provided a clear workflow.
- Being a web based system, provided simultaneous access capability from anywhere
- Provided a central source of real-time transaction information
- Provided a secure access to the system and also an enterprise transaction log to keep track of all transactions and changes.
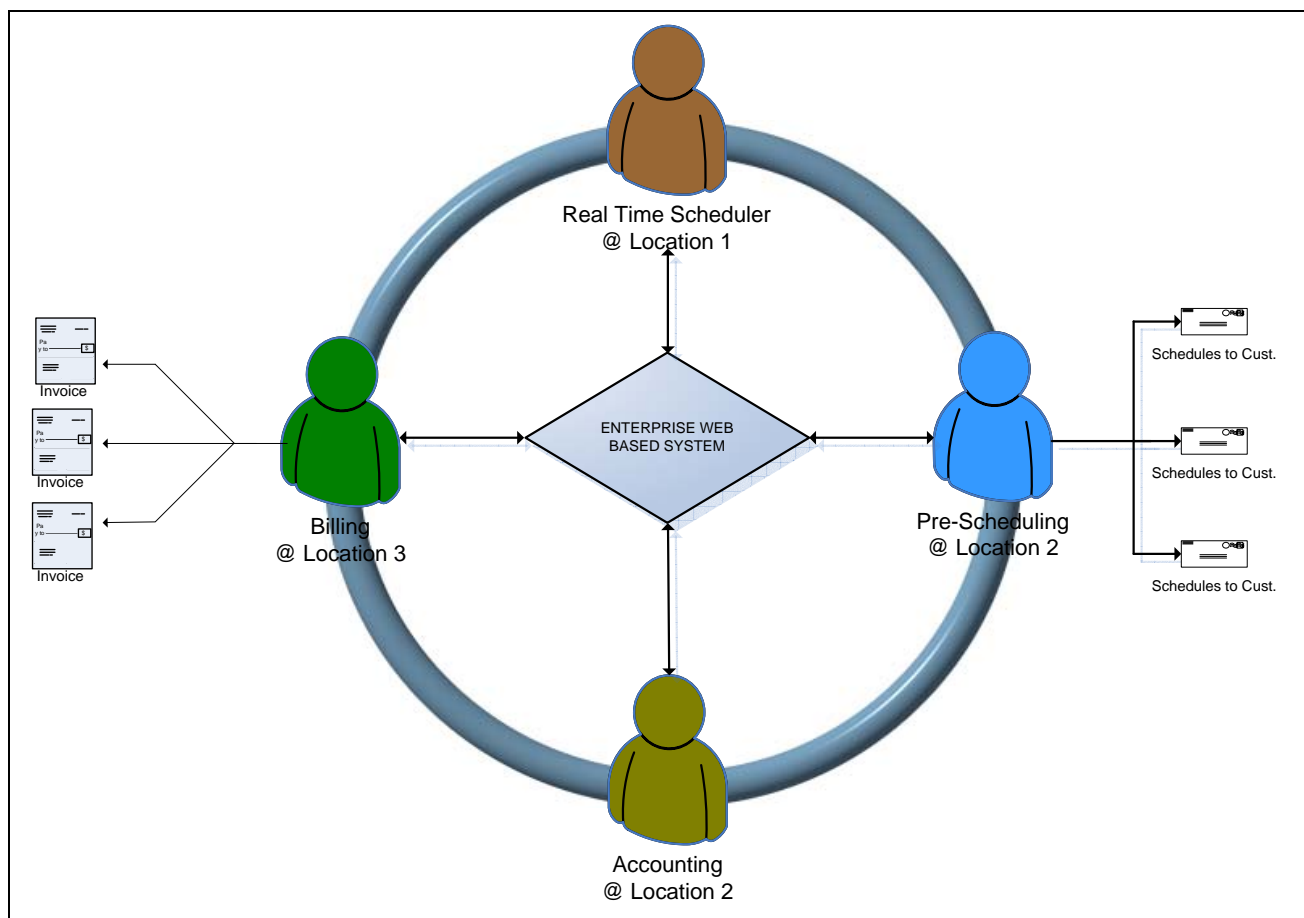

Figure 2:
Simplified Schematic of Proposed Solution

Deployment & Knowledge transfer

Fortech provided support and onsite maintenance for the client, through the initial deployment and trail phase. The deployment met all performance requirements specified by the company, going live ahead of schedule.

Fortech provided necessary development and consulting services throughout the engagement. The company and Fortech jointly deployed the application that is currently running on ORACLE™ application server. The whole application was developed using platform independent J2EE Framework.

Fortech also created a hot backup system for fault tolerance. The platform independence was attractive because of it is flexibility and portability. The application was designed to provide real time scalability, supporting an unlimited number of concurrent users, and has a comprehensive security framework that easily supported the encryption technology using SHA-1 secure framework.

Fortech's solution has provided various advantages and business benefits that include:

- **Enhanced efficiency**

    The web service-based architecture has further automated the forecast, scheduling, accounting & tagging process, and proved to be a relatively simple, low-cost approach to meeting all the standards and specifications.

- **Improved reliability**

    The new system automates much of the error handling process and has reduced error rates

- **Scalability**

    The new system has the ability to handle markedly increased requests for transactions

- **Improved Flexibility**

    The system is flexible enough to integrate with any external system or 3rd party solutions quickly and efficiently using a standard XML interface

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