Yarra Valley Water
Melbourne, Victoria, Australia

Asia Excellence Award: Workflow and Imaging, Gold

Executive Summary

Corporatizing the supply of water in Australia's second largest city and breaking away from an expensive mainframe environment provided the impetus for water supplier Yarra Valley Water to develop and implement image and data retrieval systems in a cost-effective client/server environment.

When the Victorian Government restructured Melbourne's water industry (Melbourne Water) on 1 January 1995, it was evident the three retail water companies formed by the split—Yarra Valley Water, City West Water and South East Water—would have to sever ties with the archaic and expensive mainframe-based system owned by the parent company. This system was costing Yarra Valley Water a massive $A10 million a year to support. In addition, any customer query took days to be answered.

Yarra Valley Water was determined to turn that situation around. This was an opportunity to develop an IT strategy that would fulfill its service delivery objectives of increasing customer service and profitability while reducing costs. It also provided them with the opportunity to excel against their competition in meeting the Victorian Government measurement criteria against which each of the three are to compete and be measured and ranked upon:

- Level of customer service and satisfaction
- Financial bottom line performance
- Environmental capabilities

Installation

Yarra Valley Water moved to a client/server-based environment using Sun servers and PCs. This new client/server platform reduced the annual support cost by more than 50 percent to an approximate $A4.9m per annum. The platform was used as the basis for the installation of Wang Laboratories, Inc. (Wang)'s OPEN/Image^{TM} sofware and OPEN/^{coldplusTM} sofware (computer output to laser disk) products which enabled further systems integration for an electronic workflow environment for internal business management and customer requests. In this environment, Yarra Valley Water developed "EasyAccess" and "Propertyflow" which include Wang's OPEN/image, Staffware's workflow product, to assist two of Yarra Valley Water's vital customer groups—plumbers and lawyers.

These customers use Yarra Valley Water's property sewerage plans and associated mapping information as part of their day-to-day plumbing and conveyancing services.

Not surprisingly, plumbers and lawyers want quick and convenient access to property information. The short turnaround of this information has allowed them to be more flexible in servicing their end customers.

Using EasyAccess, Melbourne plumbers now receive property sewerage plans and approvals from their local plumber supplier in less than 15 minutes. With Propertyflow, lawyers send requests by modem and have a conveyancing package delivered back within a time period as short as 30 minutes if requested. These times are a vast improvement on what customers previously faced—10 days and two weeks respectively.

Each customer service system is integrated with the OPEN/image system which interfaces with Yarra Valley Water's workflow mapping, billing and document management systems for the quick collation of information requested by customers. Wang's OPEN/^{coldplus}TM software is utilized for on-line financial and billing history.

The benefits to plumbers using EasyAccess include:

• Enhanced client satisfaction levels through the speed of process realized by their own end customers;

• The automation of the way plumbers do business with Yarra Valley Water by reducing the time spent processing standard applications from ten days to less than 15 minutes;

• Greater access geographically to services and property data via any one of ten plumbing suppliers who are linked to the Yarra Valley Water computer system;

• The relevant approval, copy of the property sewerage plan and any other information such as special conditions of connection are automatically sent back electronically to the plumbing outlet without any manual intervention from Yarra Valley Water;

• Paperwork is reduced and plumbers can pay on-the-spot for the service;

• Plumbers realize the added convenience of picking up supplies while waiting for the application to process;

• EasyAccess is available to plumbers outside regular business hours.

• Reduction in operating expense of an approximate $A3, 000 per annum as a result of the improved service provided.

Benefits to lawyers using Propertyflow include:

• Ability to generate a faster, more efficient method of providing property information to the conveyancing industry;

• Enhanced client satisfaction levels through the speed of process offered;

• Standard requests have been reduced from two weeks to a 30 minute response time if requested;

- The incorporation of a billing module for convenient monthly customer accounts;
- Money back guarantee for service delivery;
- Reduction in operating expense of an approximate $A3, 000 per annum as a result of the improved service provided.

In-house benefits to Yarra Valley Water include:

- An approximate 50 percent reduction in per annum system support costs (approximately $A4.9M), as compared to the prior $A10M per annum for mainframe support;
- EasyAccess and Propertyflow generating $A1.2M, a 40 percent increase in revenue per annum for the products;
- Work management solutions have realized Yarra Valley Water an 8.5 percent reduction in staff for the overall company, realizing $A1.3M salary saving per annum;
- Efficiency savings passed on to customers of $A3 per application, an approximate $A3,000 savings per customer per annum;
- Significant gains in customer satisfaction levels, which has also provided a "food chain" effect to their customer base whose own clients are also realizing higher levels;
- System ability to be transplanted to any number of government utilities such as water, electricity and roads, offering greater efficiencies to the public at large, and additional future revenue stream potential for Yarra Valley Water;
- The system is measurably allowing them to meet the ranking goals as stated by the Victorian Government: customer service and satisfaction, financial performance, environmental betterment.

In-house benefits to Yarra Valley Water using OPEN/^{coldplus} include:

- Monthly financial reports have gone from being presented as bulky paper documents to real-time on-line data;
- Managers no longer wait for several days for reports, but have immediate on-line access to financial, billing history and ratepayer correspondence;
- Response time across 4.4 million pages of information is within 1.5 seconds;
- Management efficiencies include tighter controls of financials and internal resources;
- Access to seven years of data on-line.

Substantial Benefits: Access by plumbers and lawyers to vital property information has been substantially increased making Yarra Valley Water's service to its customers not only more efficient, but enabling substantial savings and workflow efficiencies for all concerned. Customers receive a greater level of customer satisfaction because of the easy to use front-end

system. It is tightly integrated with all other systems, enabling immediate feedback and billing.

System Scope: Yarra Valley Water is responsible for supplying water to more than 600,000 customers in the Melbourne area. Any plumbers servicing the region can access approvals, property information and any other information electronically from EasyAccess outlets at plumbing supply stores. Any lawyer servicing the area can make inquiries to Yarra Valley Water's Propertyflow application—via modem, mail or fax. Internally, both Wang's OPEN/image and OPEN/^{coldplus} software have been licensed to 100 users with appropriate access rights. Installed this year 1996, the system currently maintains 1.5 million customer-related documents. Additionally, the new electronic fee-based services are generating $A1.2M per annum, or a gain of 40 percent in revenue for the same products in the prior period.

Technology Innovation: Yarra Valley Water assigned Wang and Staffware the job of developing alternatives to nominated applications resident on the legacy mainframe hardware. Wang and Staffware integrated the output from several of Yarra Valley Water's existing core applications and developed packaging and delivery mechanisms for customer service applications. Wang provided the imaging system, OPEN/image, and computer output to laser disk system, OPEN/^{coldplus}. OPEN/image system holds Yarra Valley Water's key imaging data such as property sewerage plans and agreements and indemnities for over 600,000 properties. This system resides within the Yarra Valley Water Company, but is accessible to plumbers and lawyers. In this first year of electronic access, plumbers alone will processe approximately 10,000 applications, or 50 percent of all transactions by plumbers, through EasyAccess.

The EasyAccess solution was developed using Wang's Open/image and Staffware's workflow software for plumbers to efficiently lodge plumbing applications which involved drawing on property information held by Yarra Valley Water. The Propertyflow system, also integrated by Wang and Staffware, enables Yarra Valley Water to respond quickly to lawyers' requests for property sewerage plans, encumbrances, rate assessments and images of any indemnities or agreements on the property.

Wang also integrated its OPEN/image and OPEN/^{coldplus} systems to Yarra Valley Water's financial system. This gives Yarra Valley Water's business managers immediate on-line access to financial and billing information. Yarra Valley Water can, within seconds, go back seven years to view customer-billing records. Financial information can be shared, modified and checked before monthly and end-of-year financial reports are electronically produced. This saves time and paper.

Implementation Approach: Wang Australia and Staffware were called in to discuss options and tender solutions to assist in developing a strategy that would enable Yarra Valley Water to move to a more cost-effective computer platform with improved customer service.

Part of this strategy involved developing innovative solutions to make disparate pre-existing applications work together. The implementation team consisted of Yarra Valley Water staff, plumbing and lawyer customers, Wang, Staffware and other system solution providers.

Yarra Valley Water provided very broad specifications in the first place. This was important to enable customers to have a high level of input into the final solution. It was realized that without customer input the systems could potentially have a disappointing level of functionality and not meet customer needs.

A roundtable approach with all interested parties meant that the original specifications were continually modified and added to as its contributors realized what was achievable. Interestingly, the client and the customer's expectation of what could be achieved in the final solution greatly increased. The more they discussed what they needed, the closer they came to achieving a very useful customer support system which was tightly integrated with Yarra Valley Water's business requirements.

Once the team established database requirements and data streams, it then undertook a prototype program. This was a pilot situation involving all users to test the initial validity of the system. Immediate user feedback was attained, and modifications made to provide early delivery of those features. Upon stabilization of the product Yarra Valley Water commenced marketing it to its customers in early 1996.

1.) Describe the system application. What the system is used for, who are the users and what does the job entail? How often or how many hours is the system in use on a daily basis.

Overview

To boost customer service, Yarra Valley Water utilized Wang's OPEN/image and OPEN/^{coldplus} (computer output to laser disk) products.

These systems interface with Yarra Valley Water workflow mapping, billing and document management systems to collate the information requested by its plumbing and lawyer customers. The system providing direct property information to plumbers is called EasyAccess and to lawyers, Propertyflow.

EasyAccess

EasyAccess has automated the way plumbers do business with Yarra Valley Water by reducing the time spent processing applications. For example, to build an extension to a house that involves altering the plumbing, a plumber is required to lodge an application and obtain approval before commencing work.

With the old manual processes and legacy systems, it could take two weeks to process an application. Not only that, the plumbers had to come into Yarra Valley Water offices in person to sign the necessary forms and pay application fees up front. Once lodged, applications were checked

manually, which took up a lot of resources internally. That would then be followed by phone calls inquiring about progress.

Now a plumber can go into any one of ten plumbing suppliers located over a wide geographical area to access the Yarra Valley Water computer system. After answering a few straightforward questions, the completed request is transmitted to Yarra Valley Water where a workflow case is automatically initiated.

The relevant approval, copy of the property sewerage plan and any other information such as special conditions of connection are automatically sent back electronically to the plumbing outlet without any manual intervention from Yarra Valley Water.

The service now provides a 15-minute turnaround for a standard request compared to ten days previously. Yarra Valley Water has simplified the process and then automated it so there is no need for manual checks of map bases, property, customer or plumber records. There is a lot less paperwork and the plumbers pay the plumbing shop a fee for the service. The result is that plumbers are keen to work with Yarra Valley Water and the level of service has improved dramatically. EasyAccess is also available to plumbers outside of the company's regular business hours.

Propertyflow

Yarra Valley Water has applied electronic technology to generate a faster, more efficient method of providing important property information to the conveyancing industry. Previously, a lawyer had to mail an application or send a clerk to Yarra Valley Water offices to make the application and pay for the service in advance. Handling requests manually by several different departments could take weeks before the package became available.

Now, inquiries come either via modem, mail or fax. Driven by Staffware's workflow software each item requested is accessed automatically from the Wang imaging system, for billing and encumbrance and mapping systems, and compiled in a file which can be either faxed directly or printed out and mailed to the lawyer. A standard request is for an eight-hour turnaround in a service that used to take up to two weeks. If you are buying a property at an auction, for example, and require a faster turnaround, the lawyer can request the information within half an hour for an appropriate fee. The service is also supported by a money-back guarantee if the information is not delivered in the time required.

The property information package includes evidence of any encumbrances, a rates assessment, including any arrears which will be part of settlement, a copy of the property sewerage plan, including sewerage pipes and drains, and an image of any indemnities or agreements on the property. The Propertyflow system also incorporates a billing module. At month's end, an itemized account of all services provided is sent to the customer.

Storage savings

Wang's systems integration has also enabled management efficiencies such as tighter controls of financials and internal resources within Yarra Valley Water's own operations. The OPEN/^{coldplus} software, for example, contains records of current bills and billing history more than seven years old. In effect, the system compresses a print file to take out white space and standard forms, and stores the data.

Historically it has been very expensive to have all the necessary data on-line. It not only takes time to retrieve the document, but it can affect the on-line performance of core applications. OPEN/^{coldplus} software is a much more cost-effective and efficient storage system.

When a user needs to access the financial history of a property or a customer has a query in relation to their bill, customer service staff can access the OPEN/^{coldplus} system to retrieve the billing history. In the future, cold technology will be used to store electronic copies of bills so that both the customer and customer service staff can view the same document.

At each month's end in the mainframe days, managers would receive financial reports from the general ledger presented as thick wads of paper. Now management with appropriate access receives an electronic message telling them that the relevant reports are on-line. Rather than waiting for several days, they can look at the data reported at the end of the financial period immediately on-screen and compare, for example, 13 months of rolling financials.

Image Capture and Indexing: The initial image capture residing on the mainframe held around 700,000 images. These showed details about sewerage and water lines on properties. It was indexed by three fields. Wang wrote an application that enabled the image and index to be imported to the OPEN/image system for automated application processing. New properties in the Yarra Valley Water district are expected to grow at a rate of three percent per annum, with each new image of any additional property being captured and stored on OPEN/image software.

Pre-Process Coding: The nature of customer requests is determined when requests enter the OPEN/image system. Workflow software is used to automatically read and allocate requests. There are a variety of pre-determined requests that customers can make. The workflow application designates which system within OPEN/image receives the request and automatically alerts the billing system to calculate the cost of the request.

Workflow Routing: The workflow software invokes Wang developed software to retrieve and package such information as property sewage plans, property maps, encumbrances, rate certificates and then presents them back to the user via modem, or in preparation for faxing or mailing.

Suspense Processing: There is no need to suspend processing as errors in customer request forms are detected and corrected on line.

Applicant Notification: Once the customer request is retrieved and automatically verified by Yarra Valley Water, it is then returned to the plumber or lawyer via fax, modem or mail.

Customer Service: Hours of operation are 7am-7pm weekdays and 7am-5pm weekends, for both Propertyflow and EasyAccess systems. If complications arise that require the intervention of a Yarra Valley Water officer, this service is available. However, such requests are virtually non-existent. The hours of operation will shortly be extended to continuous availability from 7.00am Friday to 6.00pm Sunday.

2.) What were the key motivations behind installing the system?

This was an opportunity for Yarra Valley Water to develop an IT strategy that would fulfill its service delivery objectives of increasing customer satisfaction and profitability while reducing costs.

When the Victorian Government restructured Melbourne's water industry into three retail water companies, it asked each retailer to compete and be ranked with each other on several criteria including:

- Level of customer service and satisfaction
- Financial and bottom line performance
- Environmental capabilities

Although Yarra Valley Water has not yet been rated independently on these criteria since it installed the new systems, strong anecdotal evidence indicates it has increased customer satisfaction over and above its competitors. The financial performance of the company has improved dramatically through enhanced work productivity and staff reductions. In addition, paper usage and customer time taken to travel to Yarra Valley Water has been drastically reduced, with positive impact on the environmental betterment agenda.

Yarra Valley Water's own surveys indicate customer satisfaction rose from 74 percent to 77 percent for all customers, including plumbers, lawyers and the general public. In addition, Yarra Valley Water has received many notifications thanking it for improving customer service.

Customers using the systems are receiving significant savings with reduced time in application lodging and travel times. Overall savings to each plumber and lawyer using the system is estimated to be approximately $A3,000 per year.

Yarra Valley Water unquestionably has become a primary water utility that, if privatized, would provide an attractive venture.

Further, Yarra Valley Water has developed a system which has the ability to be transplanted to any number of government utilities such as water, electricity and roads. As such, Yarra Valley Water and Wang are in discussion with other government utilities that have shown a keen interest to deliver similar cost-efficiencies and improved customer services.

3.) Please describe the current system configuration (number and type of software, servers, scanners, printers, storage devices, etc.).

Sites:	One—Yarra Valley Water
Image Systems:	One Sun Solaris server running Wang OPEN/image and OPEN/Cold^{plus}, Microsoft Windows clients.
	A further 11 servers running billing system, account system, asset management system and office automation system.
Volumes:	Plumbers: EasyAccess—12,500 transactions per annum, with expected 100 percent growth rate over 6 months.
	Lawyers—Propertyflow—40,000 per annum.
Operations:	7 am-7 pm weekdays, 7am-5pm weekends.
Scanners:	One Bell Howell 338 scanner.
	One Fujitsu 3096 scanner.
Workstations:	• EasyAccess • 10 PCs at plumbing outlets; 8 Yarra Valley Water PCs. • Propertyflow • 50 PCs at lawyer offices, with expected growth rate to 100 PCs in next six months; 5 Yarra Valley Water PCs.
Fax Gateways:	Dual Zetafax servers supporting 8 lines each.
Image Server:	One Sun 1000E4 server with 512Mb memory, 132Gb of hard disk, running Solaris and Wang OPEN/image and OPEN/^{coldplus} software.
Printers:	Five non-dedicated printers.
LAN:	10Mb Ethernet LAN.
Communications:	Via Ethernet and client/server.

4.) How is this system integrated with the company's other information processing systems?

There has been an enormous amount of integration involved in the provision of the Yarra Valley Water customer service and internal financial solution. Yarra Valley Water has integrated all database applications in order that workflow is automated and that information is passed electronically to appropriate areas of the company for business efficiencies.

Plumbing and lawyer inquiries on a property trigger the OPEN/image system to retrieve information. Databases that have been integrated with the OPEN/image system include the billing system, graphical information system and the encumbrance system.

Once a customer information package has been collated, the Wang developed software creates an entry to be posted to the core billing system to invoice the customer. The package will be passed to the document management system for archival so that history on that property can be retrieved.

At the end of the fiscal year, Yarra Valley Water produces reports on each ratepaying property. That information can be electronically transferred from the core billing system to the OPEN/^{coldplus} system that generates ratepayer bills for water, sewerage and refuse.

5.) Describe how the company has been impacted by this system. Be as specific as possible. What cost savings, increased revenues or work productivity improvements have been realized since the system was first installed?

Yarra Valley Water measures system benefits in three ways:

1. Improved customer service and satisfaction.

Since Propertyflow became operational to lawyers, approximately 50 high-volume lawyers, representing around 15 percent of lawyer volume, have begun using the system by modem or have applied to be linked by modem.

Approximately 50 percent of all lawyers in the area are either using Propertyflow via modem or facsimile.

Approximately 70 percent of applications by plumbers can be done using EasyAccess. Since EasyAccess became operational to plumbers, around 40 percent of all transactions that can be conducted by EasyAccess are being done by this system. These applications can be processed automatically without any Yarra Valley Water staff involvement. Additional services are planned that will increase the transaction rate at plumbing shops.

Response times to customers have vastly improved. Applications to lawyers previously took approximately two weeks. Applications now take between 30 minutes and three days, depending on the nature of the application and cost.

Application processing for plumbers previously took approximately ten days. Applications now take 15 minutes at a location that suits them. Plumbers no longer need to drive to Yarra Valley Water's main office to lodge an application.

Yarra Valley Water surveys indicate customer satisfaction rose from 74 percent to 77 percent for all customers, including plumbers lawyers and the general public. In addition, Yarra Valley Water has received many notifications thanking it for improving customer service.

2. Reductions in Yarra Valley Water costs.

There is estimated to be a dramatic reduction in system costs to Yarra Valley Water. The company is expecting to receive a significant return on its

systems investment within 18 months. The previous mainframe system failed to make a return.

Reduction in Yarra Valley Water staff numbers has been 50 percent for plumber application processing and lawyer information processing. The total number is approximately 30 people. Yarra Valley Water has realized an overall 8.5 percent reduction in staff for the company, representing $A1.3M in salary savings per annum.

3. Pricing restructures

Yarra Valley Water has adjusted its pricing policy for application processing which has resulted in an overall saving to the customer of approximately $3 per application, while EasyAccess and Propertyflow are generating $A1.2M, a 40 percent increase in revenue per annum for the products.

Customers are receiving significant savings with reduced time in application lodging and travel times. Overall savings to each plumber and lawyer using the system is estimated to be approximately $A3,000 per year.

How has business workflow been affected (compared to before system implementation)?

Previously plumbers and lawyers had to lodge their inquiry, including payment, by mail or in person to Yarra Valley Water's main office. Yarra Valley Water manually processed each application using data entry staff. This could take up to two weeks.

Now lawyers dispatch applications from their office either via modem, mail or fax. Electronically lodged applications enter Yarra Valley Water's Propertyflow system and are automatically processed and billed. Information processing has been integrated and streamlined for those applications lodged by mail or fax. Once in the system, the application is automatically processed, then quickly checked, before being returned to the lawyer by fax or mail. This process now takes 30 minutes to three days (reduced from two weeks), depending on the nature of the application and costs.

Yarra Valley Water established a franchise among ten plumbing supply outlets for plumber applications. Plumbing outlets were chosen to house the system as a convenient location to plumbers wanting supplies.

Today the plumbing retailers undertake the data entry. The application is a simple checkbox application that takes around two minutes to enter and dispatch to Yarra Valley Water. The approval is given and faxed back within 15 minutes (reduced from 10 days). The OPEN/image system is automatically activated to release requested property sewerage images. Applications are processed without any Yarra Valley Water staff involvement. The plumbing retailer bills the plumber and Yarra Valley Water bills the retailer.

Yarra Valley Water has technical operators that can assist in more complicated plumbing jobs. It also has sales representatives who visit plumbing retailers to ensure the system is running smoothly. Yarra Valley

Water staff morale is higher with greater customer involvement other than performing data entry work only.

6.) Describe the implementation process and methodology, the Project Team, and any change management and business process re-engineering addressed.

Methodology

Step 1—Yarra Valley Water and Wang established the database requirements. It was felt that the data elements should be independent of the business process to allow new ways of organizing data streams.

Step 2—Rapid prototyping was undertaken as proposed revised changes to business processes were tested.

Step 3—The Yarra Valley Water and the Wang and Staffware teams worked directly with key Yarra Valley Water customers to attain immediate feedback on those prototypes and to provide early delivery of those features. This was a pilot situation to test the initial validity of the system.

Step 4—The team documented the requirements on the basis of the prototypes.

Step 5—A system test cycle before formal hand over of the software to Yarra Valley Water.

Project Team

There were seven Wang, Staffware and third party specialists in the project team. This was a very fluid arrangement with many part-time participants and substantial customer input. In addition, there was continual informal interchange with participating vendors. Wang had the task of integrating the solution and delivering imaging and customer service products. Yarra Valley Water coordinated the project and delivery was reliant on the goodwill of each participating party.

Change Management and business process re-engineering

Change management procedures were an agreed process based on Wang's quality management system. This allowed users to ask for modifications to the system and nominate changes. Yarra Valley Water would then sign off prior to any changes being made. Wang used software that tracks its change management procedure. The software also tracks problems and records resolutions.

Business process reengineering was inherent in delivering the solution. The project team knew it had to think outside the existing Yarra Valley Water businesses process boundaries to improve the flow of information.

1.) Innovation
1A: Innovative use of technology to further strategic objectives

Propertyflow: The emphasis has been to push work from Yarra Valley Water out to lawyers' offices. This way Yarra Valley Water could reduce staff

numbers and give lawyers more control over their property applications. Previously lawyers would fill out a form, send it off to Yarra Valley Water with a check, and wait for a reply. Lawyers wanted more control because they are often under pressure with property settlement issues. Now that they have their contribution to a conveyancing package automated, the next step is to offer similar services to other utilities in the property industry.

EasyAccess: Yarra Valley Water wanted to reduce the need for plumbers to visit Yarra Valley Water office for plumbing approvals and property plans. Now plumbers can have their applications processed while picking out supplies from plumbing shops. The plumbing retailer has been trained by Yarra Valley Water to handle applications and accepts fees on behalf of Yarra Valley Water for the service. EasyAccess handles standard plumbing cases only (approximately 70% of all plumbing transactions) at the moment. Wang and Staffware are involved in the development of non-standard cases that are currently being tested.

1B: Degree of complexity in the underlying business process and IT architecture.
Complexity in the underlying business process involved:

In automating Yarra Valley Water's work processes, many mental barriers needed to be broken down. Many practices at Yarra Valley Water were extremely old. For example, lawyers had to pay their account before they received information and plumbers had to sign all application forms. The end result is that organizational boundaries have been broken down electronically. It used to be that several different departments would be involved in putting information together for customer information packages on topics such as property sewerage plans, drainage and encumbrances. Now this is completely automated or handled by a single person.

The EasyAccess & Propertyflow solutions have been in operation since early 1996 and Wang has been asked to provide further solutions in addition to the original specifications. In particular Wang has become involved in the preparation and customization of standard business letters as customers contact Yarra Valley Water by mail or phone.

Complexity within the IT architecture included:

Previously none of Yarra Valley Water's core business systems, including mapping, accounting and asset management systems, had ever worked together. The complexity arose out of integrating these pre-existing systems with each other and also integrating new systems, including Wang's OPEN/image and OPEN/^{coldplus} software technology.

A further complexity entailed the need to communicate with all the vendors who had provided new and pre-existing hardware applications systems. In integrating the solution and developing integrated customer service systems, Wang needed to utilize technical expertise and effective communica-

tion skills with users and vendors to make the right decisions, while maintaining high morale among each participating party.

The following applications were integrated:

- Staffware workflow software and customer interface solution;
- the billing system with read-only customer details, rates and outstanding notices;
- the Phoenix system which contains maps of Yarra Valley Water assets such as water pipes on properties;
- Wang OPEN/image with property sewerage plans showing water and drainage pipes as well as any agreements and indemnities;
- Wang's Customer Information Exchange database featuring encumbrance information and Propertyflow and EasyAccess transactional information;
- Wang OPEN/^{coldplus}running financial, billing history, ratepayer correspondence and document management systems.
- Some databases were non-compatible, which involved acquiring and installing database gateways for communication between disparate systems.

1C: Creative and successful deployment of advanced workflow and imaging concepts

- Activities/Use showing creative emphasis on imaging:
- Wang's OPEN/image allows Yarra Valley Water to store a variety of image types as part of EasyAccess. Propertyflow images from the OPEN/image repository are packaged with the output from otherwise linked systems for convenient delivery to Yarra Valley Water's customers.
- Activities demonstrating tangible success of imaging:
- If Yarra Valley Water had not undertaken the imaging of its property sewerage plans on every property in the metropolitan area, it would not be able to offer the Propertyflow and EasyAccess to its customers.
- Both the Propertyflow and the EasyAccess system operate from the property plans or the indemnities and agreements for properties. Customers need this information to be able to conduct their work. It was critical that the plans were scanned and imaged on Wang's OPEN/image system for EasyAccess to customers.

1D: Achievement of Business Process Reengineering and/or continuous improvement

Business process reengineering achievements were to reduce Yarra Valley Water staff levels and shorten the time frame in providing information to customers. The advantage in having workflow software at the front-end of the system is that this provides statistics for measuring performance of the system over time. Yarra Valley Water has developed these systems keeping

in mind key public indicators of customer service and environmental betterment.

2.) Implementation
2A: Successful implementation approach

The emphasis was on prototyping user needs, formalizing the requirements as they evolved, testing the system, and then packaging and releasing the software to Yarra Valley Water. Inherent in this approach, which ultimately resulted in a successful solution, was discourse with users and vendors from the very beginning of the project.

2B: Extent of change management process

User Education:

Lawyers—Propertyflow system: All lawyers on the Yarra Valley Water database received an information package about the installation of the Propertyflow system. Those lawyers that indicated they would link up to the system by modem were offered training by Yarra Valley Water staff in their offices. This training took approximately 30 minutes.

Plumbers—EasyAccess: All plumbers on the Yarra Valley Water database were similarly mailed an information kit notifying them of the EasyAccess system. There is an ongoing marketing process involving focus group events at the plumbing retail outlets, and across-the-counter information when plumbers come to the Yarra Valley Water site.

Yarra Valley Water surveyed all plumbers that came into the site to find out why they were not using the system. The results of this survey are being used to tailor the educational program to plumbers.

In addition, training of franchisees involved two days for at least two people, including a store manager, at the Yarra Valley Water site. Yarra Valley Water is continuing to provide on-going refresher training to the retail outlets on a needs basis.

Internal Yarra Valley Water staff training—Propertyflow: Before it was released for general use, Yarra Valley Water asked training staff to produce every application using the new system three times. This provided an opportunity for staff to learn and find faults with the system so that any glitches or inefficiencies could be overcome before it was operational. The final trial showed no failings that indicated a stable system.

Internal staff training—EasyAccess: There was an initial training period of one day for EasyAccess staff, which is continuing as new products, including increased index and customer retrieval functionality, are being added to the system. Refresher courses are available on as-needed basis.

System Documentation and Training:

Wang produced four system documents for the Yarra Valley Water system. The first three documents are mandated by Wang's software development methodologies, the fourth was requested by Yarra Valley Water.

1. The Product Functional Specification for Wang's development methodology, included formal documentation of system requirements. This document evolved throughout the prototyping period.
2. The Software Design Specification containing the internal system design.
3. The External Interface Specification which stresses the interface points of the system. Wang uses the last two documents for software maintenance purposes and for its in-house training program.
4. The Hand Over Document to Yarra Valley Water containing the site's operational characteristics for on-line operational support of the system. Yarra Valley Water help desk staff use this document for training.

2C: Level of overall system complexity

System Scope:	100 OPEN/image licensed users
	100 OPEN/Coldplus licensed users
System Processing Capacity:	One Bell Howell 338 scanner
	One Fujitsu 3096 scanner
	One Sun Solaris server.
	Five Hewlett-Packard LaserJet 4 printers.
	62,000 images for lawyer and plumbing transactions.
	600,000 site images, with growth rate of around 3 per cent per year.
System Distribution:	One—Yarra Water Valley.
	60 remote plumbing and lawyer organizations.
	Mix of dial-up and high-speed leased lines.
System Integration:	One Fujitsu mainframe system (now redundant.)
	Propertyflow and EasyAccess systems.
	One Wang OPEN/^{coldplus} system—financials, billing history, rates records.
	One OPEN/image system—property sewerage plans, Propertyflow and EasyAccess processing, integrated to workflow software, billing and maps.
	Sun server platform, IBM compatible PCs for client platform.
System upgradeability:	Adequate capacity to handle estimated business growth. If applications and users outgrow existing systems, the client/server platform can be cost-effectively enhanced

| | with new servers and PCs. |
| | Jukeboxes can be added to handle excess cold documents and images. |

2D: Level of integration with other advanced technologies

There was major integration with a number of other vendors to make Yarra Valley Water's internal and customer service systems seamless to the end users.

The vendor technologies other than Wang's OPEN/image and OPEN/Cold^{plus} technologies include:

Staffware	workflow software and for the front-end solution;
Oracle	database supplier;
Sun	Solaris hardware platform;
IBM	PC clients;
EDS	core billing and collection application;
TSW	asset management system;
Computron	financial system;
ConsulCAD	graphical information system.

3.) Impact
3A: Extent and impact of demonstrated productivity improvements

Since Propertyflow became operational to lawyers, approximately 50 high volume lawyers, representing around 15 percent of lawyer volume, have begun using the system by modem or have applied to be linked by modem.

Approximately 50 percent of all lawyers in the area are either using Propertyflow via modem or email. Approximately 70 percent of applications by plumbers can be done using EasyAccess. Since EasyAccess became operational to plumbers, around 40 percent of all transactions that can be conducted by EasyAccess are being done by this system. These applications can be processed automatically without any Yarra Valley Water staff involvement.

Response times to customers have vastly improved. Applications to lawyers previously took approximately two weeks. Applications now take between 30 minutes and three days, depending on the nature of the application and cost.

Application processing for plumbers previously took approximately ten days. Applications now take less than 15 minutes at a location that suits them. Plumbers no longer need to drive to Yarra Valley Water to lodge an application.

3B: Significance of cost savings

There is estimated to be a dramatic reduction in system costs to Yarra Valley Water. The company is expecting to receive a significant return on its

systems investment within 18 months. The previous mainframe system failed to make a return.

Reduction in Yarra Valley Water staff numbers has been 50 percent for plumber application processing and 50 percent for lawyer information. The total staff reductions were about 30 people.

Customers are receiving significant savings with reduced time in application lodging and travel times. Overall savings to each plumber and lawyer using the system is estimated to be $A3000 per year.

3C: Level of increased revenues, product enhancements, and customer service or quality improvements.
Improved Revenue/Product Opportunities:

Yarra Valley Water has commenced work to expand its system to automate non-standard plumber applications and has asked Wang and Staffware to increase functionality of customer systems.

Improved revenue opportunities for Yarra Valley Water include the opportunity to on-sell the intellectual property rights of their systems. Yarra Valley Water is currently in discussion with other utility providers about this.

Improved Customer Service:

For lawyers: Applications by lawyers previously took approximately two weeks to process. They now take between 30 minutes or three days, depending on the nature of the application, cost, and is supported by a money-back guarantee.

Now lawyers dispatch applications from their office either via modem, mail or fax. The application is automatically processed, then quickly checked, before being returned to the lawyer by fax or mail. Payments can now be made in a customary business manner after the service has been delivered.

For plumbers: Application processing for plumbers previously took approximately 10 days. Applications now take less than 15 minutes at a location that suits them. Plumbers no longer need to drive to Yarra Valley Water to lodge an application. From the one location they can access the company's services and purchase plumbing supplies.

Improved Application Processing Quality:

Previously Yarra Valley Water manually processed each application using data entry staff. Now most applications can be processed without staff involvement. If there is staff intervention, it is by one person alone, rather than numerous people handling different, specialized areas of the application.

The workflow front-end provides consistencies in data gathering, data exit and validation process and an audit trail to track the progress of every application.

Monthly financial reports have gone from being presented as bulky paper documents to real-time on-line presentations. Managers no longer wait for several days for reports, but have immediate on-line access to financial, billing history and ratepayer correspondence. Response time across 4.4 million pages of information is within 1.5 seconds.

3D: Proven strategic importance to the organization's mission

Yarra Valley Water recognizes that water is an essential commodity to society. As such, it is committed to providing world class water and sewerage services. Its EasyAccess and Propertyflow systems have enabled the organization to take giant leaps in delivering faster customer service in the provision of these products.

These systems have proven a difference can be made in the importance of improving customer services and have given it a base in continuing to provide quality solutions cost-effectively.

By operating in a corporate environment, Yarra Valley Water has been able to change its focus to customer service and core business savings.

3E: Degree to which the system enabled a cultural change within the organization

Yarra Valley Water culture has changed to provide a more significant customer focus. The company has demonstrated that it can provide top quality customer service using clever technology. Yarra Valley Water changed its thinking from believing that it had to have a hands-on approach to customer service. Those notions have given way to the knowledge that technology can offer customers what they want and even go beyond their expectations in providing excellent service. Customers now access to information at the locations that suit them achieving results in shorter time frames.

Yarra Valley Water staff now have new and more challenging roles as they are no longer involved in laborious paper processing and data entry roles, but are either liaising with customers, working with computer soft copy or negotiating for the use of the system with other utilities organizations.

By decommissioning mainframe data processing, Yarra Valley Water now has a cost-effective client/server environment enabling it to be customer focused. Its attitude now is to get the job done and to not let obstacles stand in the way.

3F: Impact of system on competitive positioning in marketplace

Melbourne water supply reforms introduced competition in the provision of services rather than customers numbers. An independent Regulator General is in the process of benchmarking the three retail suppliers. These benchmark ratings are due to be released in December 1996.

In the meantime, Yarra Valley Water believes it is leading the field in providing innovative services to customers. Feedback from lawyer and

plumbing customers, who are free to operate all over Melbourne, indicate they want other water retailers to adopt the same services and have asked Yarra Valley Water to organize that its competitors adopt the same systems.

The following matrix highlights some of the key benefits:

Corporate Overview	• Yarra Valley Water • One of 3 retail water providers in Melbourne as a result of the Victorian Government restructuring • 1.5 million customers with approximately 560,000 properties connected to the water or sewerage system, & associated 600,000 site plans on-line (property, sewerage, & service access maps) • Opportunity for Yarra Valley Water to develop an IT strategy that would fulfill its service delivery objectives of increasing customer satisfaction and profitability while reducing costs. • Wang and Staffware designated for mainframe transition to c/s • Wang and Staffware developed EasyAccess & Propertyflow Apps. • Accessible from lawyers offices and geographically dispersed plumbing supply retailers for application processing • Significant increase in customer satisfaction levels with "food chain" effect to their own customers clients due to faster processing • System ability to be transplanted to other government utilities such as water, electricity and roads potential future revenue stream • Customers requesting the other 2 water retailers automate to Yarra Valley Water system • The system is measurably allowing Yarra Valley Water to compete against the other 2 retailers based on the Victorian Government's ranking criteria—customer service and satisfaction, financial performance, environmental betterment
System Impact	• Realized approx. 50 percent per annum system support cost savings through client server architecture now $A4.9M per annum as opposed to prior (inherited) mainframe $A10.0M per annum • EasyAccess and Propertyflow generating $A1.2M, a 40 percent increase in product revenues • 8.5 percent staff reduction for company as a whole,

	realizing $A1.3M salary savings per annum • Efficiency savings of $A3 per application passed to customers representing an approximate $A3,000 per annum per customer • System ability to be transplanted to other government utilities such as water, electricity and roads potential future revenue stream • The system is measurably allowing Yarra Valley Water to compete against the other 2 retailers based on the Victorian Government's ranking criteria • Only one of the three water retailers to automate
Innovative use of technology to further strategic objectives	• Delivered application processing capabilities to the Lawyers office, shortening application processing time from 2 weeks to 30 minutes when requested • Delivered application processing for plumbers directly to geographically dispersed retail plumbing suppliers, plumbers can have application processed while picking out supplies, shortened application time from 10 days to less than 15 minutes • System available to plumbers beyond normal business hours now 7:00 am—7:00 pm weekdays and 7:00 am—5:00 pm weekends (soon to provide continuous weekend coverage) • Enhanced customer satisfaction with "food chain" to their customers' clients through faster delivery of service to their clients for improved Yarra Valley Water processing time • Operating cost savings for both plumbers and lawyers of approximate $A3K per annum • Enhanced employee job satisfaction, developed a diverse/flexible workforce with an 8.5 percent reduction of staff or $A1.3M in salary savings per annum • Product revenues up 40 percent to $A1.2M per annum • Approximate $A5M per annum system support savings from prior mainframe system • 1.5 million documents on line • 7 years of financials managed online through OPEN/^{coldplus}
Wang work management software	• OPEN/image & OPEN/^{coldplus} for Sun Solaris • 100 User licenses

Propertyflow Application /Lawyers	• Developed for needs of Lawyers • Ability to generate a faster, more efficient method of providing property information to the conveyancing industry; • Enhanced client satisfaction levels through the speed of process offered; • Standard requests have been reduced from two weeks to a 30 minute response time if requested; • The incorporation of a billing module for convenient monthly customer accounts; • Money back guarantee for service deliver; • Reduction in operating expense of an approximate $A3,000 per annum as a result of the reduced fee structure provided.
EasyAccess Application/ Plumbers	• Developed with input from Plumbers & Suppliers • Enhanced client satisfaction levels through the speed of process realized by their own end customers; • The automation of the way plumbers do business with Yarra Valley Water by reducing the time spent processing standard applications from ten days to less than 15 minutes; • Greater access geographically to services and property data via any one of ten plumbing suppliers who are linked to the Yarra Valley Water computer system; • The relevant approval, copy of the property sewerage plan and any other information such as special conditions of connection are automatically sent back electronically to the plumbing outlet without any manual intervention from Yarra Valley Water; • Paperwork is reduced and plumbers can pay on-the-spot for the service; • Plumbers realize the added convenience of picking up supplies while waiting for the application to processed; • EasyAccess is available to plumbers outside regular business hours: 7:00 am—7:00 p.m. weekdays and 7:00 am—5:00 p.m. weekends (soon to provide continuous weekend coverage) • Reduction in operating expense of an approximate $A3,000 per annum as a result of the reduced fee structure provided.
OPEN/coldplus	• Eliminated bulky paper documents and transportation

	• Real-time on-line data access • Contains records of current bills and billing history more than 7 years • Response time across 4.4M pages = 1.5 seconds • Tighter controls of financials and internal records
Implementation Approach	• Wang to assist in the development of a strategy to move from mainframe to client/server platform • Improve customer service • Integrate to all disparate systems • Encouraged high level of customer input to final solution • Pilot (customer) test by end users, real time changes prior to release • Internal pilot test by employees—complete three full application processes each—assisted in identifying bugs before release to customers • Software released to Yarra early January 1996
Implementation Team	• Round table approach • Members included staff, plumbing and lawyer customers, Wang and Staffware and other system solution providers • Team effort realized a high level of input • Client and customer expectations elevated through approach
User Education	• Minutes of training for lawyers, all mailed information package • Ongoing seminars for plumbers at the retail plumbing supply location, mailed information package, continuous market surveys at sites for system improvement plumbing supply retailers 2 days training two people minimum must include a manager • One day training for internal Yarra Water Valley employees, mandated the completion of every product application at least three times when training complete
System Documentation	• Product Functional Specification—Wang's development methodology, included formal documentation of system requirements. Document evolved through prototyping period. • Software Design Specification—containing internal system design. • "Hand Over" Guide—containing the site's operational characteristics for on-line operation support of the

	system. Yarra Valley Water help desk uses this document for training.
Major Integration with other vendors applications:	• The vendor technologies other than Wang's OPEN/image and OPEN/Coldplus technologies include: • Staffware: workflow software and for the front-end solution; • Oracle: database supplier; • Sun: Solaris hardware platform; • IBM: PC clients; • EDS: core billing and collection application; • TSW: asset management system; • Computron: financial system; • ConsulCAD: graphical information system.
Competitive Advantage	• Coverage to Plumbers over extensive geographical area thru plumbing supply retailers • Ability to submit applications while selecting supplies • All requests received via modem, mail or fax • Only water utility provider to have developed a revenue stream based on applications and requests for information • Requests fulfillment completed with no manual intervention by staff, staff morale improved and now have customer oriented focus • Ease of doing business attracting plumbers and lawyers to doing business with Yarra Valley Water • Same audience driving for the two other water utility providers to automate to the Yarra Valley Water model • Yarra Valley Water only water retailer of three to automate • Provides potential future revenue stream from other government utilities interested in solution • Measurable competitive advantage for the Victorian Government's measurement and ranking criteria • Level of customer satisfaction and service • Financial and bottom line performance • Environmental capabilities