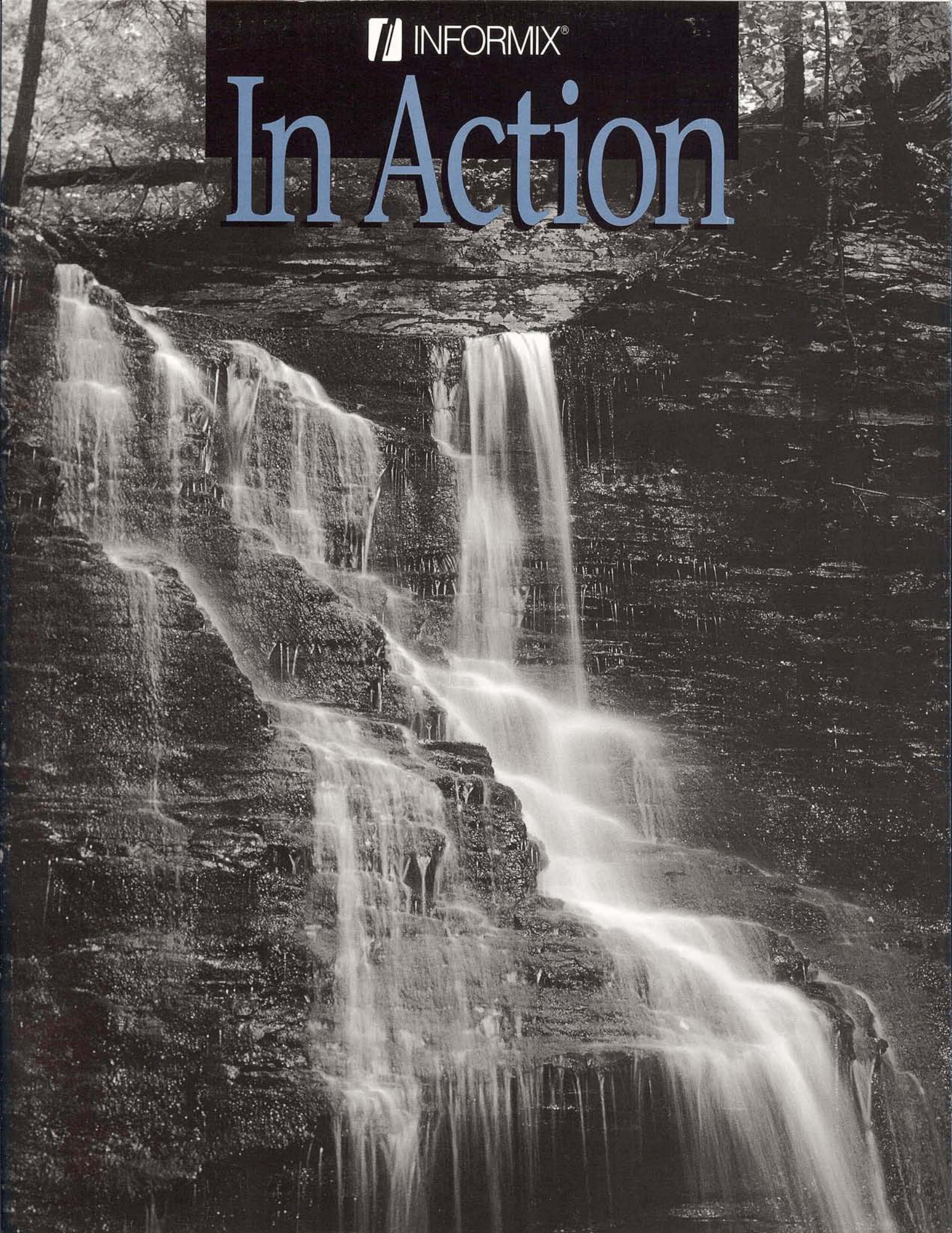

INFORMIX®
In Action

INFORMIX

In Action

About the Cover:
Nature's elements work in harmony to shape and define our world. Informix believes that technology must work in the same way to shape the corporate computing environment and offers the information management products you need to make that happen.

For more information please write:
Editor, Informix In Action
Informix Software
4100 Bohannon Drive
Menlo Park, CA 94025

Contents

Welcome to the second edition of *Informix In Action.*

As Informix continues to grow, *Informix In Action* brings you successes from around the world, from a variety of industries.

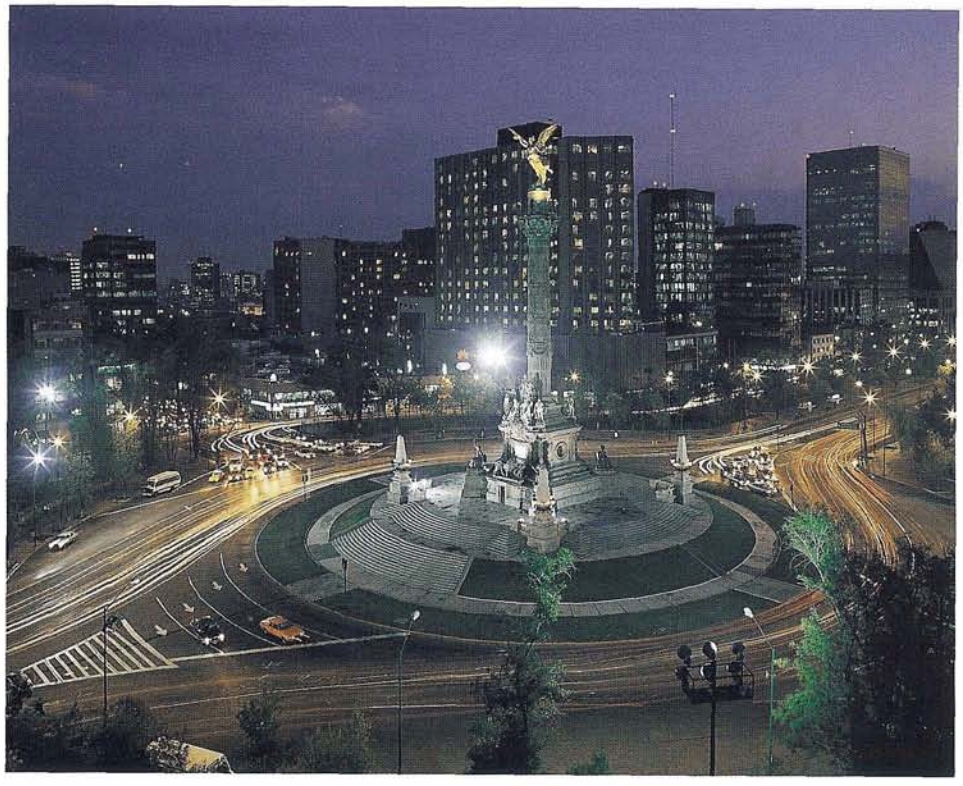
These stories represent what we see happening in the market — a move toward open systems computing, specifically downsizing, as companies seek ways to make the most of their computing systems. Beyond information management, cost effectiveness and competitive advantage are reasons why decision makers are banking their business on Informix, UNIX, and open systems.

With these and many other successes under our belts, *Informix In Action* will continue to highlight examples of Informix in action.

Phillip E. White
Chief Executive Officer
Informix Software, Inc.

Informix Pays Off for Hacienda

The charter of Hacienda y Crédito Público, Mexico's internal tax agency, is to collect taxes from the 80 million Mexican citizens and from thousands of businesses. Faced with increasing taxpayer evasion and dwindling public coffers, Hacienda installed an on-line information system based on Informix relational database management system (RDBMS) software, 75 Hewlett-Packard servers, and the UNIX® operating system. Since its installment in 1989, the new system has helped the agency manage information, locate tax evaders, and increase gross revenues by 20 percent.



Charting a New Course

In 1988, Mexico's economy was in crisis. Inflation hovered at 150 percent, the country's gross national product (GNP) was expanding at a meager two percent, and the government faced a deficit equal to 17 percent of its GNP.

The Mexican government stood at a crossroad. Should it take additional foreign loans to keep the economy afloat? Or should it institute a new national economic policy based on monetary and fiscal discipline and a wage/price stabilization program?

It chose the latter — and with dramatic results. In the first half of 1991, Mexico's inflation rate had dropped to 10 percent, its real GNP growth rate had doubled to four percent, and the government's deficit had shrunk to an estimated two percent of GNP.

A critical part of the deficit reduction was the government's ability to increase tax revenues by 20 percent. This was accomplished by installing a more efficient, state-of-the-art information system based on Informix software. Working through a local Informix distributor, Hacienda has developed the tools to locate and track tax evaders, which has enabled the government to fill the treasury and improve its fiscal standing.

Industry: Government

Hardware: Hewlett-Packard, Unisys, AT&T

Application: On-line tax case management

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL
INFORMIX-SQL

"The difference today is that, with the Informix/UNIX combination, we can manage information more efficiently and we can pinpoint taxpayer evasion," says Jorge Hernando, director of information services. "Before, taxpaying was almost voluntary because there was no way to enforce it.

"Hacienda employees now have instant on-line access to the complete records of taxpayers — who paid last year, how much they paid, and what they should owe this year," says Hernando. "If a payment is received and there is a discrepancy with last year's return, the employee can compare the two returns on line. Or, he or she can contrast the taxpayer's return with those of colleagues in the same occupation to ensure parity and consistency.

"Also, employees don't have to search through paper files now. Information is always available and current. With the new system, Hacienda has reduced its paper use by 80 percent."

Mainframe System Provided Dated Information

Before installing Informix, Hacienda used an information system that was based on an IBM 3031 mainframe and a Cullinet database. The system presented Hacienda with three major challenges:

- outdated information. Because regional offices uploaded data to the central office in batch mode, information was frequently outdated by the time it was processed and distributed to Hacienda's regional or local offices. This resulted in lost collection time and inaccurate address information.
- no querying or analysis capabilities. Workers were unable to conduct queries and searches because they lacked on-line access to the information. Therefore, they couldn't determine trends or patterns that would help them uncover tax evaders.
- paper inundation. Because Hacienda was largely paper-based, information was difficult to locate, time consuming to find, and frequently lost.

> "Our Informix solution has been a major success, and has helped to stabilize our economy and government."
>
> *— Jorge Hernando —*

Informix and UNIX Enable Decentralization

Hacienda installed INFORMIX-OnLine on 75 Hewlett-Packard 9000 servers at central and regional offices, and INFORMIX-SE on 300 Unisys 6000 PCs at local offices throughout the country. OnLine is Informix's powerful, on-line transaction processing (OLTP) database server that provides high performance, high availability, and multimedia support. Because of the scalability and portability of the Informix/UNIX solution, Hacienda could simply recompile its database applications and port them across the range of Hacienda's hardware — from large symmetrical multiprocessor servers to PCs.

"It used to be too costly to automate smaller offices that monitored only 2,000 taxpayers," says Hernando. "But UNIX provides us the low-cost hardware and Informix the portability so that we can run the same applications on the largest or smallest machines cost effectively."

As Mexico's population grows, the scalability of the UNIX machines will be essential for managing Hacienda's expansion.

"Today, in Mexico City we might have one machine handling a geographic area," says Hernando. "But as Mexico City expands we can easily shift the applications to another machine and divide the records in two. This way we can handle the work load without having to increase the size of the machine. Informix's scalability gives us the flexibility to tailor the solution to meet our needs."

INFORMIX-4GL: The Preferred Language

Hacienda uses the INFORMIX-4GL Product Family that includes the INFORMIX-4GL Rapid Development System, INFORMIX-4GL Interactive Debugger and INFORMIX-4GL Compiler. The Informix fourth-generation language application development environment has become the 4GL of choice among Hacienda programmers.

"Our programmers have what I call '4GLitis' — they want to do everything with 4GL," says Hernando. "Whenever they face a programming challenge in C, they look for ways to use INFORMIX-4GL."

The INFORMIX-4GL Rapid Development System enables Hacienda developers to build applications that port easily from Hewlett-Packard multiprocessor platforms to Unisys, AT&T, and Hewlett-Packard uniprocessor platforms. And the INFORMIX-4GL Compiler transforms INFORMIX-4GL source code into standard C code, providing Hacienda applications with unparalleled speed and its end users with quick response time.

A Stable Economy and Government

Thanks to the new direction Mexico embarked upon in 1988, Mexico's economy is prospering and its government is fiscally strong.

"Today, the average Mexican knows that the government is managing information more efficiently," says Hernando. "They know there is a higher risk of getting caught if they don't comply with the tax laws. The positive side is that it makes people feel that the tax burden is being more equitably distributed and people are paying their fair share. Our Informix solution has been a major success, and has helped to stabilize our economy and government." ■

Informix Furnishes Conforama's Solution

Conforama is putting its trust in Informix and open systems to revamp the information management system for its 200 European outlets. Beyond its choice of the INFORMIX-OnLine relational database management system (RDBMS) and the family of INFORMIX-4GL application development tools, Conforama's selection of Informix and UNIX attests to the capacity of open systems to handle major transaction-intensive applications that must operate 24 hours a day, seven days a week.

Industry: Retail distribution

Hardware: IBM, Bull, NCR, Datapoint

Application: Administration, finance, and distribution management

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL

The Conforama Group

The Conforama Group is the European leader in the distribution of home furnishings with a network of nearly 200 retail outlets managed directly or under franchise, and located mostly in France but also in Luxembourg, Switzerland, Spain, and Portugal. The Conforama Group deals with approximately 10 million customers annually and carries more than 6,000 items in its stores. In 1991, the Group had sales of 12.9 billion francs with a total of 8,200 employees, including its franchises.

The Role of Information Management

Conforama's information management system plays a vital role in the company's retail distribution activities. It not only handles sales, marketing, and financial information but also transmits the *savoir-faire* of the Group and contributes to the uniformity of its image among its retail outlets. The company's database applications integrate the three levels of business information: outlets, regions, and headquarters.

The Historical and Technical Dimension

The rapid growth of the Group prevented the implementation of a homogeneous information management structure because different systems and hardware were in use. The Group's own data processing, based on a BULL DPS 7000 system, had trouble communicating with the franchised outlets' systems. These outlets currently have IBM, Bull, NCR, and Datapoint machines running UNIX or proprietary operating systems and the corresponding applications, which have been developed independently. Furthermore, the level of automation differs from site to site.

In addition to communication problems, this diversity also multiplies development and maintenance costs. Consequently, the Group's information organization and systems department decided, within the context of a master plan, to refit its commercial information management system.

The New System

The new information management system was designed to improve the nature of the Group's base business: the distribution of home furnishings. The first priority was to improve customer service, allow the exchange of information with suppliers, and provide new operating procedures in the management of the retail outlets — for example, reduce waiting time at the register and give customers more precise information about products or sales agreements. In contrast to the Group's administrative and financial activity, which could be handled by standard software, the unique nature of its commercial activity required custom applications.

> When we opted for open systems, Informix seemed the best choice because of its global scope, its suitability to the UNIX environment, and the quality of its products.
>
> ***— Jean-Claude Kerrinckx —***

Selection Criteria

This new system had to meet two basic criteria:

- speed. The solutions selected had to permit high productivity for the rapid development of the applications. Indeed, the competitive situation is very acute in retail distribution, calling for a tight project schedule.
- reliability. The reliability of the deployed system was of capital importance as the stores have neither data processors nor database administrators on staff. Furthermore, the stores are open to the public six days a week, some even seven.

Other Important Criteria

To reduce installation and maintenance costs, the development of applications had to be centralized yet flexible enough to adapt to the needs of each store or region.

Scalability was another requirement, as the system had to accommodate the differing sales volume of each store and expand as new outlets were added. And it had to be sufficiently upgradeable in order to quickly handle new application demands and constraints not originally anticipated. Finally, the system had to help establish a homogeneous image for the Group by permitting the efficient circulation of qualitative information. This includes, for example, consistent product descriptions from outlet to outlet.

Reasons for Conforama's Choice

In light of these constraints, Conforama's information organization and systems department tended toward open systems. According to Jean-Claude Kerrinckx, head of this department, open systems is "an absolute requirement. It's in these open systems that one will find efficient databases and development tools. We are convinced that it is in this arena that new technologies will appear, and that this choice will permit Conforama to have access to the best-performing products on the market."

Having made this basic selection, Conforama launched its revamping project, dubbed "Mercury."

In November 1991, following six months of research and comparison of the various products available, Conforama selected Informix and development has been under way since December 1991.

According to Kerrinckx, "When we opted for open systems, Informix seemed the best choice, because of its global outlook, its suitability to the UNIX environment, and the quality of its products."

The Selected Products

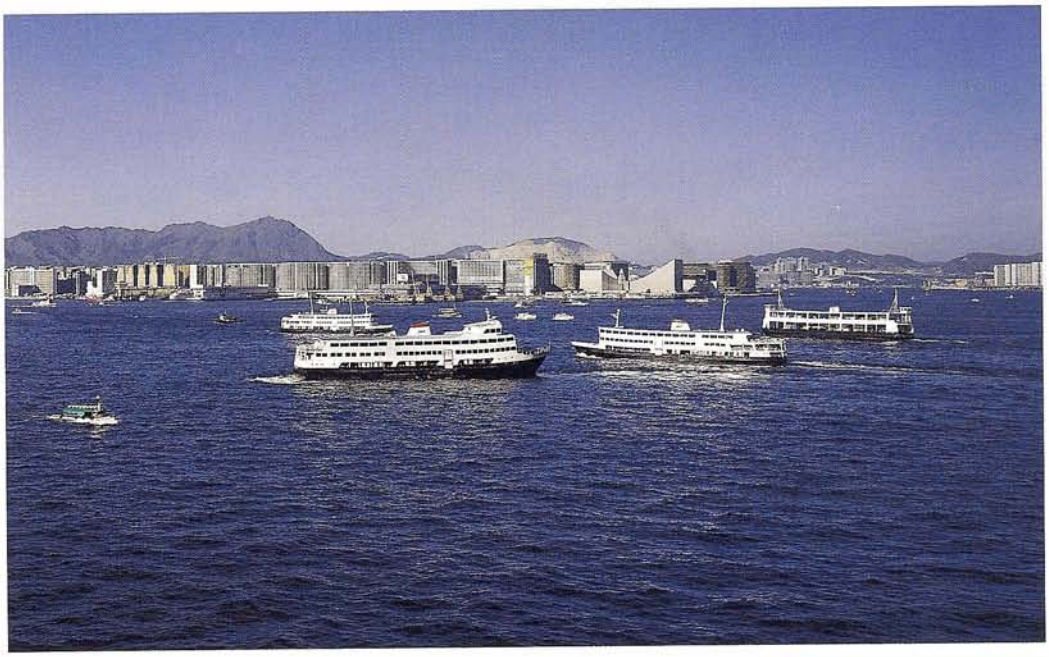
Conforama specifically selected the INFORMIX-OnLine 5.0 database server and the INFORMIX-4GL family of development products. In the context of the Mercury project, these products will constitute the basis for the development of applications intended for business management in the head office as well as in the retail outlets. To facilitate the administration of the system, Conforama is developing, among other applications, a multisite operating management program that will handle the distribution and consistency of the applications.

Project Schedule

The Mercury project will be operational at the start of 1993 and, when finished, will involve 6000 users. It will run on 200 systems which will be connected to 600 point-of-sale terminals.

According to Kerrinckx, "In the increasingly competitive world of retail distribution, it is essential that a company's data processing system be absolutely reliable. It must also be able to absorb technological innovations without rendering the existing system obsolete. In addition, it must be flexible enough to respond easily to new requests from its users. Informix's technology will be part of the development of such a system for Conforama, thus reinforcing our position as the uncontested leader in the European market." ■

All Aboard with Informix and the Hong Kong Ferry



The Hong Kong and Yaumati Ferry Co. Ltd. have recently implemented a UNIX-based fare revenue system, the first of several new applications to be delivered this year built with Informix's database servers and application development tools. Developed by Hong Kong Ferry (HKF), the Informix-based system tracks ticket sales on all franchised ferry services in Hong Kong.

Industry: Transportation

Hardware: Sequent

Application: Fare revenue tracking

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL
INFORMIX-SQL
INFORMIX-ESQL

Holding the Islands Together

Ferries of HKF are the backbone of Hong Kong's busy seagoing passenger services. In 1991, these ferries carried more than 28 million people and 1.5 million vehicles between Hong Kong, Kowloon, and the outlying islands. With 23 scheduled routes linking Hong Kong to ports as close as Silvermine Bay and as distant as Macau, and a further four excursion routes linking centers of population to local holiday destinations, HKF's daily operations require careful scheduling of ships and crews. The scheduling is heavily dependent on the statistics produced by the fare revenue system.

Founded in 1923, HKF was an early user of information technology. As the ferry and associated businesses grew with the population and economy of the city, HKF moved to automate their systems in order to maintain efficiency and low costs. Today there is an experienced team of full-time computing professionals working in the company's rapidly expanding MIS department.

The Fare Revenue System

The new fare revenue system replaces an earlier spreadsheet-based system that ran on multiple PCs. This first system was considered cumbersome and lacked security.

"It was too easy for people to change the parameters," says Anthony Lau, senior systems analyst for HKF. "We had occasions when people would change a formula without authorization. It was vital that we move the system under central control."

With INFORMIX-4GL, HKF has created an application that has all the flexibility of the spreadsheet system and more.

"We had to have that flexibility," says Edward Tam, EDP department manager for HKF. "During the year there can be many changes to our fare pricing structures for ordinary class, deluxe class, promotion tickets, off-peak hours, and so on. The system has to be able to reflect these changes immediately from a single point of control."

Key Business

HKF is Hong Kong's largest public ferry operator and they rely on their EDP systems to help them plan their services efficiently.

"Ferries are the key business of our group of companies," says Tam. "We cannot run our business efficiently without accurate planning based on revenue forecasts. This is the purpose of the new fare revenue system — to monitor revenue collection in each class of service and for each type of ticket. It is not so much the final amount that is important as the distribution, across days of the week, time of year, and ferry route."

Escaping the Proprietary Trap

After evaluating various hardware possibilities, HKF made a deliberate decision to build the new system on UNIX instead of utilizing their existing proprietary hardware.

"With proprietary hardware, we were locked in to that vendor for upgrades and we couldn't get the price/performance advantages that UNIX offers," says Tam. "Staying with our proprietary system was not a strategic move for our company and our staff wanted to move to newer technologies."

"A number of our applications continue to run on the proprietary system," says Lau. "However, all new applications will be developed on UNIX. If major changes are required for the existing system, I expect that they will be ported to UNIX too."

> "We chose INFORMIX-OnLine because it met our requirements for reliability and fault tolerance."
>
> — *Anthony Lau* —

Fault Tolerance

Reliability is one of the criteria for the success of the system. HKF chose Informix running on Sequent Symmetry S2000 because of the fault-tolerant functionality and good price/performance ratios of the combination.

"We chose INFORMIX-OnLine because it met our requirements for reliability and fault tolerance," says Lau. "Our programmers are also very comfortable with the INFORMIX-4GL programming language. After just reading the manuals and watching the demonstrations, they were confident that this server and tool would do what they wanted."

The programmers are happy with the choice. They had compared Informix against its three major rivals but found that none could match the INFORMIX-4GL programming environment, or the easy transition from using a traditional third-generation language. Now they are evaluating Wingz® with HyperScript® for a possible executive information system (EIS) front end to the Informix database.

Reliability

The system was 10 months in development and has now been live for four. Development and maintenance of the system is conducted in Kowloon on the mainland, while the production system is run from central Hong Kong.

"So far we haven't had a single database problem," says Lau. "Not that it's a simple configuration, we have nearly 100 PCs connected to the Sequent. They are grouped into two local area networks (LANs), one on Hong Kong island and one in Kowloon, joined by a LAN bridge across the harbor."

Early Success

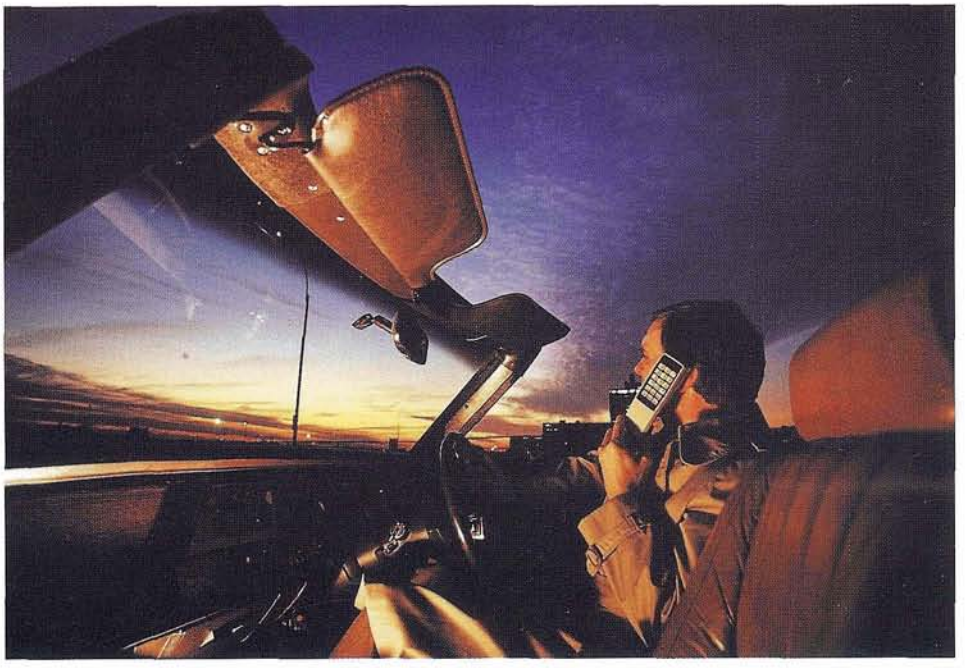
With the first system going live early in 1992, HKF is already looking forward to developing further Informix applications.

"Now that we have successfully implemented this first project, we are planning to start work on a second, the human resources system," says Tam. "At the same time, we are already producing a feasibility study for a third application."

The human resources system will integrate three applications — personnel, payroll, and duty roster scheduling — and will be used by all the major subsidiaries of the HKF Group. Again, it was the flexibility and ease of maintenance for an INFORMIX-4GL solution that helped gain management approval. ■

British Telecom Mobile Calls on Informix

For an upwardly-mobile business person, the cellular phone is proving to be the one really indispensable item of late 20th century technology. British Telecom (BT) Mobile, a leading player in the UK's growing mobile telecommunications industry, is using Informix software to ensure it stays ahead in this fast-moving market. It uses a comprehensive range of Informix products and is one of the earliest users of Informix's flagship product, the INFORMIX-OnLine database server for the UNIX and NetWare® operating systems.



Industry:
Telecommunications

Hardware: Hewlett-Packard

Application: Voice messaging accounting and billing, cellular phone supply and tracking

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL
INFORMIX-SQL
INFORMIX-ESQL/C

Supporting Telecommunications

The Mobile division of BT sells cellular telephone equipment, both directly and through distributors and phone shops. It is also an "air time retailer," acting as an intermediary between Cellnet (which is 60 percent owned by BT) and its end users. Cellnet bills BT Mobile for air time, and BT Mobile, in turn, bills the customers. BT Mobile also operates radio paging services and voice messaging services whereby messages can be "banked" and picked up later.

Informix supports these activities in three important areas. First, a custom Informix system looks after part of the division's core business, that is, the supply of cellular phones and accessories to end users, distributors, and phone shops. Besides phone supplies, the Informix-based system also tracks sales of certain pagers and high-tech gadgets like cellular fax machines that are sold directly to end users. The Informix-based application is responsible for stock control, order

processing, and invoicing for all these products. It also tracks sales, and manages maintenance services and spare parts distribution.

BT Mobile's second application built with Informix is a marketing database used for a variety of mail-shots and market research activities.

Voice Messaging

The third major system using Informix handles accounting and billing for voice messaging services such as Voice Com. For this application, Informix products have been used to enhance and customize the Mach 4 Accounts package — written by Informix VAR, Mach 4 — which is well suited to the increasingly international nature of BT Mobile's business.

"We're billing not only the UK but also Hong Kong and Australian users, so it's important to us that Mach 4 is multicurrency," says Ian Goddard, BT Mobile's Informix system manager. "In fact, we're billing one big customer in European Currency Units (ECUs)."

Because of the power of Informix's query and reporting capabilities, BT Mobile frequently finds the easiest way to analyze data in non-Informix systems is to load it onto the Informix database.

A Volatile Business Environment

BT Mobile bought its first UNIX machine, a Zilog, back in 1985 to handle stock control. Later the Informix stock control system was extended to include order processing and invoicing. In those early days, BT Mobile faced a particularly volatile business environment, so the scalability and flexibility of Informix software was important for BT Mobile to be able to adapt to future changes.

A lot of Informix's flexibility derives from the dynamism of the relational database management system (RDBMS) which, unlike other models, doesn't make the unrealistic assumption that system developers will know in advance all the ways in which users are going to store and retrieve data.

"With an RDBMS, you can change as you go," says Goddard. "For example, when incorporating the dispatch dates, we originally recorded them as straightforward dates. Then management wanted to track how long orders take to go through the system and we needed to change over to recording day and time. With Informix, it was easy to add the extra fields to the Informix database."

Over a Gigabyte of Data

From small beginnings with half a dozen users, the workload of the Informix systems grew and grew. Today, Goddard estimates that the three Informix-based systems are handling well over 200 tables and more than a gigabyte of data. In a single 10-day period, 180,000 transactions and six million reads were recorded by OnLine, Informix's high performance database server. Around 50 users can be using the system at any one time.

BT Mobile now runs its Informix systems on an HP9000, with a second HP9000 for development and test activities. The stock control system has become highly sophisticated, with automated warehouse management capabilities. Portable bar code readers are used to gather details of incoming and outgoing stock, and to carry out stock checks. The bar code readers can be attached to a docking station to feed their data directly into the Informix system, which can process it in much the same way as ordinary keyboard input.

The HP9000 is networked to a Hewlett-Packard Vectra machine running Sun Accounts, the accounting package from Sun Microsystems. Each invoice run on the stock control system produces a list of entries to be passed across the network for posting in the Sun Accounts system. But there's also network traffic in the opposite direction.

"A lot of the reporting requirements for Sun Accounts are met most easily by putting the data back into the main Informix database and running Informix reporting," says Goddard. "There are a vast number of reports on the system and we're always enhancing and adding to them. I don't know how our users would manage if we didn't have this ability to write new reports quickly."

BT Mobile uses a comprehensive range of Informix products to support its varying information needs. These tools include INFORMIX-4GL, INFORMIX-SQL, and INFORMIX-ESQL/C.

> "With OnLine we can do incremental backups, just copying the records that have changed."
>
> — *Ian Goddard* —

A Painless Upgrade to OnLine

BT Mobile was among the earliest Informix customers to upgrade to OnLine, a process that Goddard describes as "nearly painless." OnLine delivered many advantages of which one of the most important was ease of backup. The marketing database in particular is very large, and backups had become rather cumbersome prior to the introduction of OnLine.

"We used to keep a spare disk, and do an overnight disk-to-disk copy, then put the data onto tape the next day, but the marketing database became just too large for us to be able to do this," says Goddard. "With OnLine we can do incremental backups, just copying the records that have changed."

The Future

Mobile technology is on the move in every sense. By ably supporting the development and operational needs of BT Mobile, Informix software is ensuring that they continue to stay ahead of the rest of the field. ■

Informix Offers Relief to LA County

Like many government agencies, the Los Angeles County Department of Public Social Services (LA County DPSS) is facing an increase in the number of people applying for benefits. They have responded to this challenge by installing an Informix-based computer solution developed by EDS, one of the world's largest system integrators. The system helps the department more effectively provide aid to the people most in need, and has saved them $5.4 million in its first six months of full countywide implementation.

Industry: Government

Partners: EDS, Cogent

Hardware: Hewlett-Packard 425T and 433 workstations

Application: Automated fingerprint image reporting and matching system

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL
INFORMIX-SQL
INFORMIX-ESQL

Relief for Those in Need

"In the Los Angeles County, one in seven residents is on welfare," says Eddy Tanaka, director of the LA County DPSS. "Each month there are 18,000 new applicants for General Relief."

The LA County DPSS, finding that fraudulent cases were taking a bite out of its limited funds, decided to install a computer system that automates fingerprint matching for its General Relief program. By checking the fingerprints of the applicants, the system can confirm that the applicant is not already receiving benefits, in turn helping to ensure that the people who are eligible *do* receive them.

Manual Fingerprinting System Doesn't Work

The LA County DPSS service area covers 4,000 square miles with 14 district offices where people may apply for General Relief. Through this state-mandated, 100 percent county-funded program, people who are not eligible for other entitlement programs — often homeless adults without children — receive monetary benefits to help them get on their feet.

In 1984, the LA County DPSS received a court order requiring them to aid homeless people regardless of whether they had personal identification. With this court order, they began to see that a small number were applying for assistance using different names and collecting multiple benefits.

"We started a manual finger printing and photographing process in our General Relief offices to discourage these applicants from abusing the program and help make sure that only the people who were entitled to aid were receiving it," says Tanaka. "However, we soon had a room full of fingerprints and pictures with no way to cross check them."

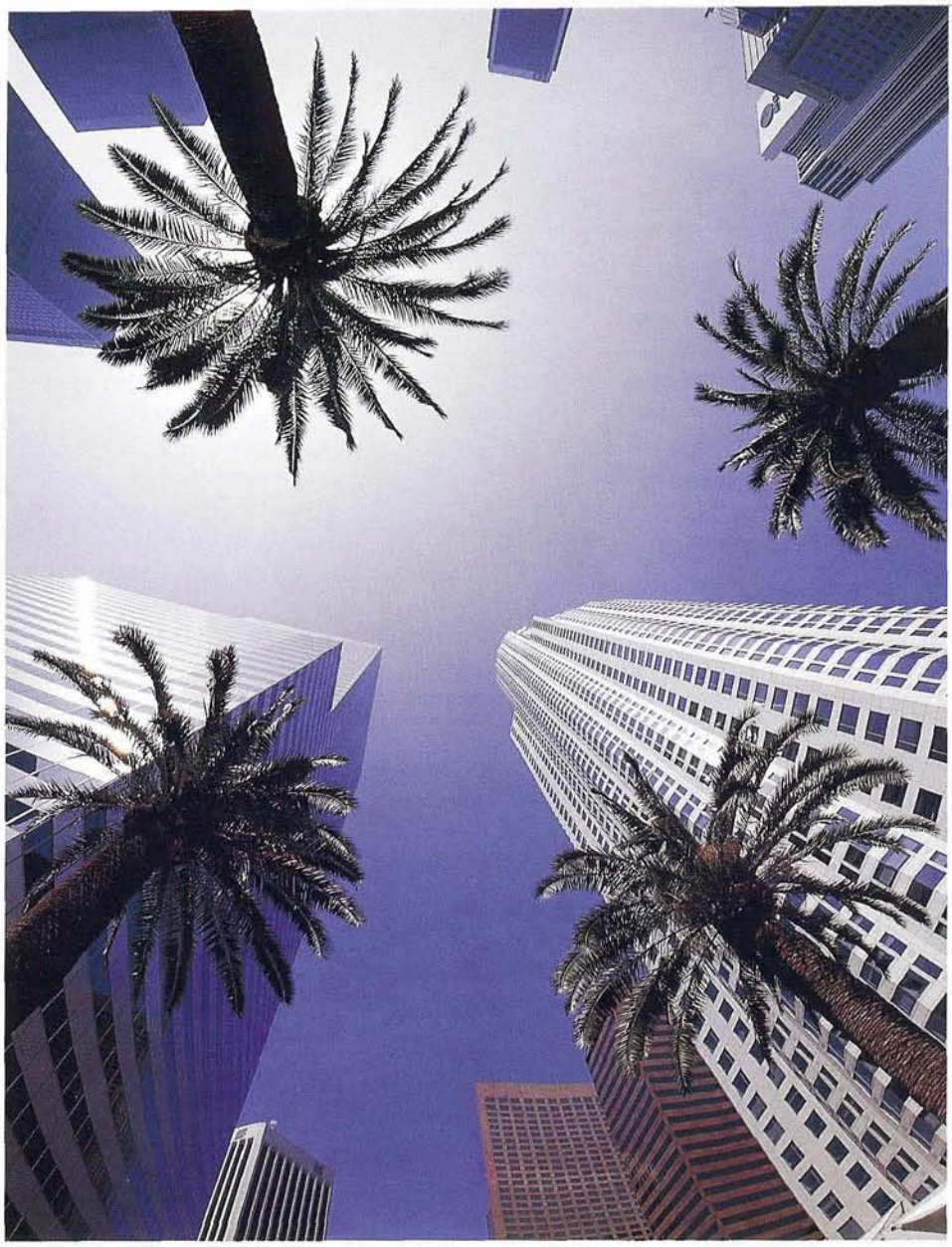
Tough Criteria for Automated System

Realizing this manual system was not working, the LA County DPSS decided to design an automated system. The criteria for the new system was tough — it had to be up and running in just 10 months, with a five-minute turnaround for matching fingerprints and a five-second response for certain queries. EDS, a provider of information technology services, responded with a viable solution based on Informix relational database software.

Informix Gets the "Thumbs Up"

In response to the LA County DPSS request for proposal (RFP), EDS brought in Cogent for its fingerprinting software, Hewlett-Packard for workstations, and decided they could achieve the best solution with a UNIX-based relational database management system (RDBMS).

EDS realized that key to the system was a database with the ability to store large tables comprised of multiple datatypes including binary



large objects (BLOBs). They also looked for proven experience in online transaction processing (OLTP). Informix provided both with INFORMIX-OnLine, its powerful OLTP database server for the UNIX operating system. OnLine features breakthrough multimedia capabilities and can store any information that can be digitized — images of fingerprints, photographs, videos, charts, and sound — as easily as text. This kind of data is stored as BLOBs, and one of the primary reasons EDS chose Informix was OnLine's BLOB-handling capabilities.

"OnLine's BLOB capabilities removed major application development barriers," says Curt Williams, EDS project director. "Today, we are able to store fingerprints as easily as text and numbers, and we've just scratched the surface of BLOB technology.

"Informix provided us with the highest confidence level that they would be there to support us and provide the resources we needed to make the system a success," says Williams.

LA County DPSS also was impressed and chose the Informix-based solution presented by EDS.

System Helps LA Meet Urgent Needs

Today, 21 Hewlett-Packard workstations installed throughout the district offices run the Cogent fingerprint matching and extraction software. Each time recipients come in to apply for General Relief, they go through an interview and, if determined eligible, are required to be fingerprinted. Each person puts their index fingers on a live-scan camera and an image of the fingerprints is captured and shipped within one minute to the central office via modem, using Informix networking software.

At the central office all fingerprints are stored on Hewlett-Packard file servers running INFORMIX-OnLine. The servers at the central office match the fingerprint and send a "match" or "no match" response back to the district office. A "match" response means the applicant is already receiving aid under another name and is not eligible for additional assistance. A "no match" means the applicant is not already getting benefits from the county.

Says Lisa Nunez, computer services division chief for LA County DPSS, "The system is client friendly — applicants don't have to place all ten fingers in ink. They just lay their two index fingers on a piece of glass and that's it."

"There is an urgency when a person is sitting across from you needing a place to stay for the night," says Williams.

"So meeting the five-minute turnaround for matching fingerprints is important. No one else has an online system like this one."

More Money Saved than Expected

With this sophisticated system, applicants cannot receive benefits under two different names and program abusers have been thwarted.

"Almost immediately after implementation, the application rate at the first three offices in LA County DPSS went down while the application rate in the neighboring offices went up," says Tanaka. "So we rushed to put the program into all offices quickly."

LA County DPSS has saved $5.4 million in the first six months of full county operation — far surpassing their expectations.

"As far as technology is concerned, we're the first in the nation to implement a system like this," says Nunez. "Other counties all across the United States have been contacting us, and have been anxiously awaiting the final outcome of this project." ■

Informix Helps JS Pathology Get the Right Results

Not every company is brave enough to rewrite a 10-year accumulation of software in one go, but for JS Pathology, a London-based medical pathology company, doing just that has provided spectacular benefits. A year after choosing Informix software and Sequent hardware, the company was inaugurating its brand new information management system.

Industry: Health care

Hardware: Sequent

Application: Laboratory analysis

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL
INFORMIX-SQL
INFORMIX-ESQL/C

A System to Grow With

JS Pathology continues to reap the benefits of its new relational database management system (RDBMS) with the INFORMIX-OnLine database server zipping through an enormous workload of 6.5 million test results per annum. And even more important than OnLine's high performance, JS Pathology knows it has a system that can grow in line with the business.

Lack of growth potential was, in fact, what prompted JS Pathology to take the open systems plunge. It was back in November 1989 that the company decided to replace its existing systems, running on a 10-year-old Wang machine, with a brand new computing environment that would capitalize on the latest thinking on operating systems and data management.

"There was no room for expansion left on our old machine — it was chock-a-block," says David Taylor, director of computer services for JS Pathology. "I think the most we could have done was add another disk drive.

"At the same time, we were building a new laboratory in Camden about two and a half times larger than the premises we had in Harley Street," says Taylor. "So we knew we would need a much more powerful computer to support that expansion."

A Complete Rewrite

JS Pathology faced a stark choice between moving to a larger machine or embarking on a complete rewrite of the system. The latter option, though certainly not the line of least resistance, offered far brighter prospects for the future.

"During the preceding few years, UNIX had been making quite an impact, and fourth-generation languages and database management systems had effectively come of age too," says Taylor. "We decided to get away from the lock-in of proprietary systems, and felt that at the same time we could use the power of a relational database to do a lot more things with a lot less hassle than we had been able to do with a third-generation language."

Having decided that an RDBMS was needed, the decision to go with Informix was made on the basis of cost and proven performance for high-throughput systems.

"We process 2,000 patient requests a day — half a million a year — generating 6.5 million results a year," says Taylor. "And because of the authorization procedures, a lot of that information is updated several times within its life. When you think that the computer systems have to support not only the laboratory activity but also the associated business functions — it's quite an active system."

With its future growth in mind, JS Pathology became interested in the combination of Informix software with a parallel-processing computer from Sequent.

"We liked the idea of a parallel system where it would be very easy to increase the processing power by adding extra processors," says Taylor. "We checked various aspects of the Sequent with some of Sequent's customers, particularly those who were also using Informix. I got some very impressive reports from people who were using Informix to run very large databases with high daily transaction volumes."

Having opted for Informix and Sequent, JS Pathology had to bite the bullet and rewrite virtually all its systems, which had mostly been coded in Wang's proprietary VS Basic.

The Challenge

Starting from scratch was a daunting prospect because the old systems were large and complex. The new software had to cope with both the technical and the administrative sides of the business, and virtually everything was to be custom, including the accounting ledgers. There were a number of smaller applications dealing with personnel and attendance, inventory control, purchasing, and more.

The development staff set to work. The eight-person team succeeded in rewriting the entire system, built up over 10 years, in just over a year from January 1990.

Fast Application Development Tools

So how was this amazingly fast rewrite achieved?

Happily the team was able to recode 95 percent or more of the system in the highly efficient INFORMIX-4GL language. The rest of the application was written in C with embedded SQL using INFORMIX-ESQL/C, primarily when complicated communications functions were required.

"We needed applications that ran in a real-time situation monitoring laboratory instruments, and these same programs needed to access and update the database, so the only real option was C with embedded SQL," says Taylor.

Taylor's team writes queries on behalf of the users rather than expecting them to do it themselves.

"I think they've got more than enough to worry about without having to think about getting information out of the computing system," says Taylor. Providing ad hoc reports is a lot faster than before. "Under the proprietary environment we had no option but to write a basic program every time, because there was no SQL type utility."

For its continuing development program, the team uses prototyping techniques taking advantage of both INFORMIX-SQL and INFORMIX-4GL Rapid Development System (RDS) features. INFORMIX-4GL RDS allows programs to be compiled rapidly into pseudo code and then interpreted for execution.

"You can modify a program, compile it and re-run it literally in seconds," says Taylor.

A Formidable Workload

The live system is dealing with a formidable workload. There are 120 terminals in the main building plus another eight or nine remote ones at three separate hospitals and clinics where JS operates pathology services. Data is fed in directly by the laboratory instruments or is keyed in by data entry clerks or laboratory technicians at their benches.

The database has reached a massive 1.5 gigabytes in size, and around 1.2 million pages of paper reports per annum trip off the company's laser printers.

These statistics would cause directors in an old-style information technology installation to tear their hair, but Taylor remains calm and confident. He's now sure he chose a winning combination of hardware and software, and is particularly pleased with the OnLine database server.

"It really does give an extremely good throughput."

Reliable System For The Future

The environment JS Pathology has chosen for its systems also gives a high degree of future proofing. The system currently has eight processors, which is adequate for current needs, but it's feasible to go up to about 30 with minimal disruption, says Taylor. "I could double the size of the system virtually overnight by installing new processors: I'd only have to tell the system that they were there. The software would need no changes at all."

The British health care sector is a notorious graveyard for computing white elephants. JS Pathology is a company that has avoided all the pitfalls and found a computer system that can be relied on to meet not only its current, but also its future, needs. ■

Informix Delivers for Züst Ambrosetti

Based in Turin, Züst Ambrosetti Trasporti Internazionali S.p.A. is a major player in the goods shipping business in Italy, and now throughout Europe. The company has moved from a highly centralized information management architecture to an open, distributed processing architecture based on Informix software and the UNIX operating system. This change guarantees increased efficiency of their operations, which is essential in a highly competitive market with limited profit margins.

Industry: Shipping

Hardware: Bull, MIPS, Hewlett-Packard, Prime

Application: On-line package tracking

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL
INFORMIX-SQL
INFORMIX-ESQL/C

An Old Trade with New Technologies

Shipping 50,000 car chassis built by the famous car designer, Pininfarina, from Turin to Detroit via an air bridge consisting of over 1,200 jumbo jet flights is but one of the records earned by Züst Ambrosetti over the course of nearly 100 years in business.

Founded in Turin in 1906, Züst Ambrosetti earned more than 600 billion lire in 1991 with a work force of 1,100 direct employees and 2,000 extended workers. Thanks to their partnership with the French group SCETA, which now owns 40 percent of Züst Ambrosetti, the company has become more European in scope with affiliates throughout the world. Every day, some 500 trailer trucks carry 3,000 tons of goods, railroad cars of Züst Ambrosetti's SIFTA and STVA affiliates transport 600,000 carloads of goods, ships carry another 150,000 tons of goods, and planes move 40,000 tons by air.

Züst Ambrosetti is organized into five divisions: Trasport International Routeir (TIR) Europe, for shipping outside Italy; Automobile Shipping; Shipping in Italy; Air Shipment; and Sea Shipment. For structural reasons, the five divisions each track their own clientele, shipping characteristics, and goods. In the past, all five divisions have relied on a single, centralized mainframe with terminals located throughout the affiliates linked by telephone.

This structure and increasing work load made it difficult to locate and access information in a timely manner.

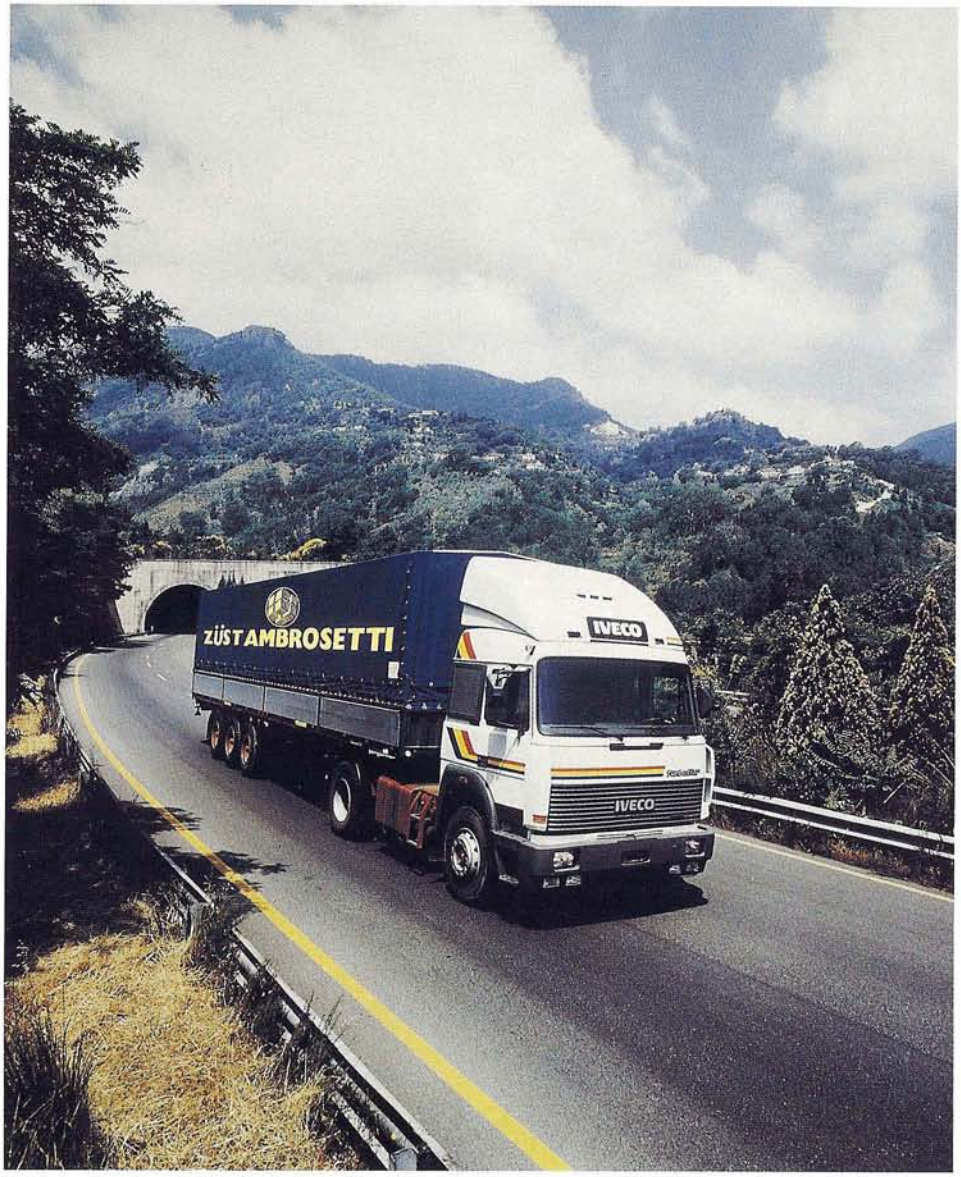
Objective: Decentralization

Züst Ambrosetti decided to build a new information management solution based on a decentralized structure for more timely and flexible information access to meet the changing needs of clientele.

"This decision to decentralize our processing was supported by an in-depth study of the proposals submitted by various suppliers, and by economic considerations viewed in light of our computing requirements," says Massimo Cavallo, director of departmental computer systems.

"Our primary goal was to completely revamp our domestic shipping sector by giving our end users the flexibility to offer new services to our clientele," says Riccardo Gasperoni, director of the domestic shipping division. "A new system would provide the extra edge that would distinguish our company from the thousands of small-time operations that are flooding the streets and highways of Italy."

To reach these goals, Züst Ambrosetti chose the UNIX operating system and the high-performance database server, INFORMIX-OnLine. Today, each of the 19 logistical centers in Italy is supplied with a minicomputer for autonomous operation. The affiliates are freed from reliance on the central mainframe, and can handle all their business with full autonomy. The former mainframe hub



now functions as a central resource serving the peripheral stations and acting as a repository for consolidated data.

"With Informix and UNIX, we met our need for flexibility and avoided the toughest bottleneck — the telephone lines the terminals used for accessing the mainframe," says Cavallo. "The unreliability of the connections, the late-night hours that are common in the shipping business, and optimizing plant costs were the major reasons for our choice."

By the end of 1992, Züst Ambrosetti will finish the transformation to the Informix-based system, and will also install a new communications network to link the mainframe with the peripheral minicomputers operating under UNIX. More than 400 PCs will be linked, some directly to the agents, others at the offices of major clients who will then be able to access information directly. It will also be possible to place an order for shipment or to check the status of a shipment from either location.

> "We chose Informix because it is conceptually closer to the transactional design of the mainframe that had been used in the company."
>
> **— *Massimo Cavallo* —**

Informix at the Heart of the System

"We chose Informix," says Cavallo, "because it is conceptually closer to the transactional design of the mainframe that had been used in the company. Moreover, it guaranteed an excellent price/performance ratio, and it met the SQL standards."

Züst Ambrosetti began working with Informix in the Autumn of 1987 at the very beginning of their decentralization effort, choosing INFORMIX-4GL for the development environment. Before the introduction of relational databases and fourth-generation languages (4GLs), COBOL was used exclusively.

Currently all shipping procedures are resident in departmental computers; the typical scenario at an affiliate consists of several UNIX systems interconnected via local networks, and linked to the other corporate computers via a geographical X25 network.

INFORMIX-4GL was used to write the procedures for domestic shipping, and to implement the overall logistic and commercial computer system of the allied SIFTA company, which manages a fleet of some 8,000 railroad cars specially designed to carry vehicles.

Expanding in the Future

In the near future, Züst Ambrosetti will work even more closely with Informix. The company already has plans to use OnLine for the backbone of a system that will be distributed to automobile importing centers.

Züst Ambrosetti had expanded from Italy and taken on a European dimension long before 1992, although many companies are still trying to make that change. The key to eliminating borders and to being competitive lies in computers and telecommunications, and Informix has played an important role. In addition to the exchange of goods, data and document exchange must be expedited as well. ■

Agence France Presse Leads with Informix

Industry: News services

Hardware: Hewlett-Packard

Application: Data transmittal

Informix Products:
INFORMIX-OnLine
INFORMIX-ESQL

The Agence France Presse (AFP), the world's third-largest wire service, has selected the INFORMIX-OnLine relational database management system (RDBMS) to computerize document management. Dubbed "Delta," this application required nine worker-years of effort to develop a program with 200,000 lines of code. The London pilot site has been operational since January 1992 and plans are to implement the system throughout AFP's 40 main locations around the world.

A Worldwide Operation

The AFP ranks with Associated Press and Reuters among the top three wire services in the world; with offices in more than 100 countries, it currently employs 1,100 permanent journalists and photographers and 2,000 freelance journalists and does approximately one billion francs' worth of business. It distributes some three million words daily, in six different languages (French, English, German, Spanish, Portuguese, and Arabic) to approximately 100 press agencies, 7,600 newspapers, 3,300 television and radio stations, and 1,500 businesses and organizations.

The Business of Reporting

Once the research is completed in the field, the stories are written in a local office and sent to a regional bureau to be verified. From there, the stories are transferred to a central location, the largest of which is located in Paris, followed by Washington D.C. and Hong Kong. At these central locations the stories are edited and categorized according to approximately 50 geographic and thematic criteria. Thus "packaged," the data becomes a "product" that is sent to the clients of the AFP wire service.

Phébus, the Existing System

AFP's current information management solution, called Phébus, has been in worldwide installation since 1988. Although Phébus permits high-speed data transmission on 386-type com-

puters, it provides no archiving or document retrieval capabilities. As a result, journalists must devote precious time to printing, cutting, filing, and reviewing large amounts of data.

Delta, the New System

Delta, AFP's new system, required 16 months of work by seven engineers. While complementary to Phébus, it was designed to be completely independent, not only of hardware but also of the various versions of UNIX on the market. Furthermore, the procedures had to be absolutely standard so that each program could be installed in the foreign offices without requiring outside help.

Today, the Delta system handles most of the AFP's documents. This includes production dispatches, information services intended for the clientele, memos, and non-editorial documents, including accounting documents. Delta also manages non-AFP documents coming from local information agencies that are entered into the text system's memory where they are placed at the disposal of the writers, who may use them again and again over a relatively long timeframe. These documents are categorized in Delta according to several criteria, including origin, language, "type," degree of confidentiality, and topic.

Text searches are made using dispatch "data fields," production date, and key words specifying the subject and title of the document. The dispatches are also identifiable by their lead, or first paragraph, which presents the main information contained in the dispatch, as well as the rest of the text, of course.

Selection Criteria

The MIS department of the AFP had decided to improve the existing system to include long-term archiving capabilities.

"The system had to be capable of managing large volumes, for archiving up to 350,000 dispatches; this represents, for example, 13 months' archives for the London office," says Erik Brière, project leader for AFP. Furthermore, documents of other types, binary items, accounting files, photos, etc., must also be able to be stored and transmitted."

Document retrieval capabilities were also a basic component of the project.

"Despite the tremendous volume," says Pierre-Yves Riou, project engineer for AFP, "the response time for a simple request could not exceed 1.5 seconds, and for a more complicated request, no more than five or six seconds."

This limited turnaround time was desired in order to provide a potentially broader base of clients with custom services at a lower cost due to reduced volume.

> "Informix had already proved its ability to manage large volumes transferred by numerous communication networks and to conduct complex multicriteria searches. We knew that we were betting on a sure thing."
>
> — *Erik Brière* —

Other System Requirements

Other conditions had to be met: the program had to speed the routing of dispatches, reducing the current transmission time of several minutes to 30 seconds. Its reliability had to be absolute, and it had to increase the message forwarding features already included in the current system. For example, message forwarding should be able to provide several levels of confidentiality.

The new system also had to be able to adapt to the volume of data managed by the offices.

"The definitive program had to be able to operate on 386 machines and be capable of upgrading," says Riou. "It had to be possible to add large amounts of memory at any time."

Finally, another important condition was total independence from suppliers: it was thus necessary that the partners in the project, from both the hardware and the software point of view, be as close as possible to market norms."

Informix is Selected

As the driving force behind the project, the MIS department directed its choice toward an Informix RDBMS.

"While the Agence Maghreb Arab Press was still in the process of computerization, Informix had already proved its capacity to manage large volumes transferred by numerous communication channels and to conduct complex multicriteria searches," says Erik Brière. "We knew that we were betting on a sure thing."

The selected configuration was based on a Hewlett-Packard 486 with 36 megabytes of RAM and a 1.5-gigabyte hard disk. The overall program, which includes the management of requests and dispatches, represents 200,000 lines of code. In addition, 70 tables of parameters were developed in INFORMIX-4GL to operate with the high-performance INFORMIX-OnLine database server.

The Schedule

The first implementation of Delta took place in November 1991 in London, one of the AFP's largest foreign offices in addition to the central locations. The 40 main offices of the AFP will soon be equipped.

"We have already experienced a considerable savings in time as well as a savings in keystrokes, thanks to the possibility of consulting documents via document retrieval and being able to perform copy and paste functions directly on screen," says Brière. ■

AA Decision Technologies Packs It In With Informix

American Airlines Decision Technologies developed a new automated Cargo Routing Guide using an Informix relational database management system (RDBMS). In an industry where bankruptcies and mergers are common events, the Cargo Routing Guide helps American Airlines' Cargo Division (AA Cargo) maintain a competitive edge by dramatically improving American Airlines' ability to leverage space on passenger flights. Because the new system automatically calculates the most cost-effective routes for shipping cargo, AA Cargo estimates a substantial cost savings over 10 years.

Industry: Shipping

Hardware: MIPS 3360

Application: Cargo routing

Informix Products:
INFORMIX-OnLine
INFORMIX-4GL
INFORMIX-ESQL/C

Providing More for Less

Staying profitable is an increasing challenge for airlines today. With a high level of competitive pressure, the airline companies must find ways to provide better service without increasing costs.

In the cargo shipping industry, AA Cargo is successful at controlling costs and providing better service while many other airlines are not. One of the primary reasons is that American Airlines invests in Decision Technologies, a wholly owned subsidiary of AMR Corporation and uses state-of-the-art technologies like Informix software to manage the complexities of cargo routing and booking.

The Challenges of Cargo Shipping

American Airlines' Cargo Division ships more than 80 million pounds of cargo per month on more than 4,000 American Airlines and American Eagle daily flights and contracted truck segments. The cargo is destined to approximately 300 cities in 32 countries around the world.

Taking advantage of available space for cargo shipments is a complex task that requires the coordination of shipment attributes, cargo

operating procedures, flight and ground transit schedules, aircraft cargo door sizes, cargo terminal and customs operating hours, special handling requirements, and weather forecasts. To determine the available cargo capacity for a given flight, you must know passenger, baggage, mail, and fuel loads — heavy passenger traffic reduces the capacity for cargo. In addition, some cargo shipments require special handling. For example, AA Cargo ships perishable goods only through airports with refrigeration facilities and avoids shipping live animals through airports with high temperatures during the summer.

Before installing the Informix-based *Cargo Routing Guide*, AA Cargo telephone sales agents and terminal clerks used cryptic host-command-based systems to select and book cargo routes. These users manually checked route characteristics including flight schedules, cargo capacities, embargoes, terminal hours, and cartage services. However, the users were unable to thoroughly check special handling requirements and conflicts on the flights. In addition, these users were unable to determine the most cost-effective flights. As a result, customers were occasionally kept waiting during the lengthy booking process, cargo was ineffectively routed, and available capacity was inefficiently used.

The Informix Decision

The dramatic increase in the cargo shipping business meant AA Cargo needed to automate the volumes of data and the decision-making process without raising shipping costs. Decision Technologies designed the *Cargo Routing Guide* to meet this demand.

This new system required an RDBMS solution that is highly dependable, functional, fast, and low cost. Because the Cargo Routing Guide uses a UNIX platform to provide flexible, hardware-independent solutions, Decision Technologies needed an RDBMS vendor that has the appropriate experience and provides consulting services.

Decision Technologies chose Informix over other major RDBMS vendors for the following reasons: Informix employs UNIX database experts, the software is easy to use, and Informix products provide the performance needed for the *Cargo Routing Guide*.

Keeping Information in One Place

The Informix-based *Cargo Routing Guide* builds routes using the more than 4,000 American Airlines and American Eagle daily flights and the ground transit segments provided by cartage and trucking contractors. The local database stores these routes, planned schedules and capacities, and a myriad of other data. In addition, the *Cargo Routing Guide* database holds up-to-the-minute data retrieved from other American Airlines systems, such as schedule and capacity changes resulting from flight cancellations, weather delays, or changes in passenger load.

This automated system now resides in the AA Cargo Quality Assurance Center that houses about 300 DOS-based workstations used by telephone sales agents. The users converse with telephone customers and input shipment attributes into a smart, user-friendly workstation application developed by Decision Technologies. This application, called QIK-CARGO, performs initial error checking and other processing before passing the route request to the *Cargo Routing Guide*. Using INFORMIX-OnLine as a fast, powerful database server, the *Cargo Routing Guide* quickly analyzes the shipment attributes and returns the optimum route within seconds. Depending on a number of complex factors, the optimum route may have the earliest arrival time or may drive the lowest operating costs.

The *Cargo Routing Guide* database was developed using INFORMIX-4GL, a fourth-generation language that provides the speed and reliability needed to manage critical information. The INFORMIX-ESQL/C development tool helps Decisions Technologies develop applications that take advantage of an industry-standard structured query language (SQL).

A Dramatic Savings in Time and Money

Now, all of the information needed to select routes is stored in one Informix database. An entire route-selection transaction, a process that used to take minutes, now takes less than 10 seconds for most shipments. This performance improvement reduces by 10 percent the time needed to handle customer calls for booking shipments, reduces agent training time, and increases agent efficiency. With the new system, all agents can recommend optimal routes regardless of the amount of time on the job.

The Informix-based *Cargo Routing Guide* improves overall service quality by proposing only routes that are compatible with each shipment, maximizes profits by incorporating operational costs and revenue management controls, and improves the booking process by allowing reservations agents to focus on sales skills and customer service needs.

American Airlines Decision Technologies, a wholly owned subsidiary of AMR Corporation, specializes in providing decision support systems, software packages, systems development, and consulting services to the travel and transportation industries and to other industries worldwide. ■

Informix and Best Foods Manufacture a Winning Formula

Best Foods, a division of CPC International, one of the world's largest food manufacturing companies, streamlines the storage, calculation, and retrieval of nutritional information with Informix software. The Informix-based system gives product developers and dietitians instant access to nutrient information needed in formula and recipe development.

Industry: Manufacturing

Partners: Spectrum Concepts and DP Tech, systems integrators

Hardware: AT&T

Application: Nutrient analysis

Informix Products:
INFORMIX-OnLine
INFORMIX-STAR
INFORMIX-4GL
INFORMIX-SQL

The Focus on Nutrition

Nutrition has become the watchword of the American diet, and food manufacturers have had to develop new, quality products that meet both consumers' taste expectations as well as today's nutrition demands. And to stay competitive they have to develop them quickly.

With over 30 years commitment to consumer health, a food manufacturer like Best Foods must generate products and recipes that uphold the company's long-standing quality reputation, as well as perform every step of the product development process as quickly and accurately as possible. Such activities include the time-consuming tasks of nutrient analysis and the development of ingredient declarations.

Nutrient analysis is a critical area for Best Foods and the food manufacturing industry, and it's gaining added importance. One reason is that the U.S. government will be requiring nutrition labeling and complete ingredient statements on packaged food products by 1993.

Analyzing Nutrients by Hand

For many years, Best Foods performed its nutrition profile analysis on an older time-sharing computer system. Researchers laboriously calculated totals of each nutrient in each ingredient of a formula or in a recipe using food composition references such as the United States Department of Agriculture (USDA) handbooks. It was a huge, time-intensive job. Nutrition profiles had to be calculated regularly for each iteration of many test products as well as modified formulations, line extensions of existing products, and consumer recipes.

As the pressure increased to quickly market new products, so did pressure on analysts to work faster with greater flexibility. That's when Best Foods turned to Informix.

Less Time, Better Job

Working closely with Best Foods, Spectrum Concepts, a New Jersey-based systems integrator, created the Nutrient Databank System (NDBS) with Informix software. Additional features were later implemented by DP Tech, another local systems integrator. The NDBS, a computerized source of over 6300 food items and ingredients (each having up to 74 nutritional values in the data file) and over 2,000 recipe and product formulas is used to:

- calculate the nutrient profile of recipes and product formulas;
- retrieve nutrient information for food items or ingredients; and
- facilitate the preparation of ingredient statements for product formulas.

Cutting Calculation Time in Half

Today, when a product or recipe is developed to target a nutritional benefit such as "low sodium" or "no cholesterol," Best Foods researchers can use their Informix-based system to instantly evaluate specified nutrient criteria and access a huge on-line library of ingredients for product formulas or recipes.

Best Foods also uses Informix to facilitate the preparation of ingredient statements for new or reformulated products. The ingredient statement for a product is the compilation of all ingredients, in order of predominance by weight. Instead of manually calculating the contribution of every ingredient — many of these consisting of their own respective ingredients — the individual components of the ingredients are available in the database.

"Informix has cut calculation time in half," says Jenny Chin, who manages NDBS for Best Foods. "Since each formula and ingredient is kept in the database, we can retrieve them quickly and develop nutrient information and ingredient statements much faster.

"In fact," says Chin, "without Informix, keeping up with our demanding analysis needs and meeting new government regulations would be extremely difficult."

Easy Information Access

Besides its clear time savings benefits, the Informix system also gives Best Foods researchers quick information access to continue their development work uninterrupted.

"Best Foods employees like the power and flexibility of Informix software because it's easy to update, it's very easy to use, and it's always accurate," says Anne Troop, manager of information services for Best Foods. "We no longer need people with programming experience to use NDBS — any R&D person can use the system. And each person can enter and modify recipes to his or her particular needs."

Chin agrees. "Right now, we're trying to configure the system so that individuals in the product development group can readily access the system themselves and run their own analysis."

Informix-based systems are also helpful in other departments and functional areas. Best Foods is currently using Informix to track recipes developed by the consumer services test kitchens, manage limited resources, report R&D project priorities, conduct periodic analytic product quality testing, and even track job openings in a recruitment management system.

> "Informix has allowed us to introduce new products quickly that meet both our quality standards and consumers' nutritional concerns."
>
> —*Anne Troop* —

Answers From a Trusted Resource

"We chose Informix because it came with all the application development tools we needed in one flexible family of products," says Troop. "We also knew that it would improve our operating efficiency based on our experience with an application built on an earlier generation of Informix. We knew Informix's products, training, and support, and were very confident about them.

"We envision a long, rewarding future with Informix," she says. "Informix has allowed us to introduce new products quickly that meet both our quality standards and consumers' nutritional concerns. And that's critical to our success in today's market." ■

Informix and Meralco Energize the Philippines

Manila Electric Company (Meralco), the largest privately owned electric utility firm in the Philippines, has implemented a UNIX-based customer service tracking system using Informix relational database management system (RDBMS) software. The system, built by Computer Information Systems, Inc. (CIS), has improved Meralco's responsiveness to the customer by carefully logging customer complaints and Meralco's response to those complaints.

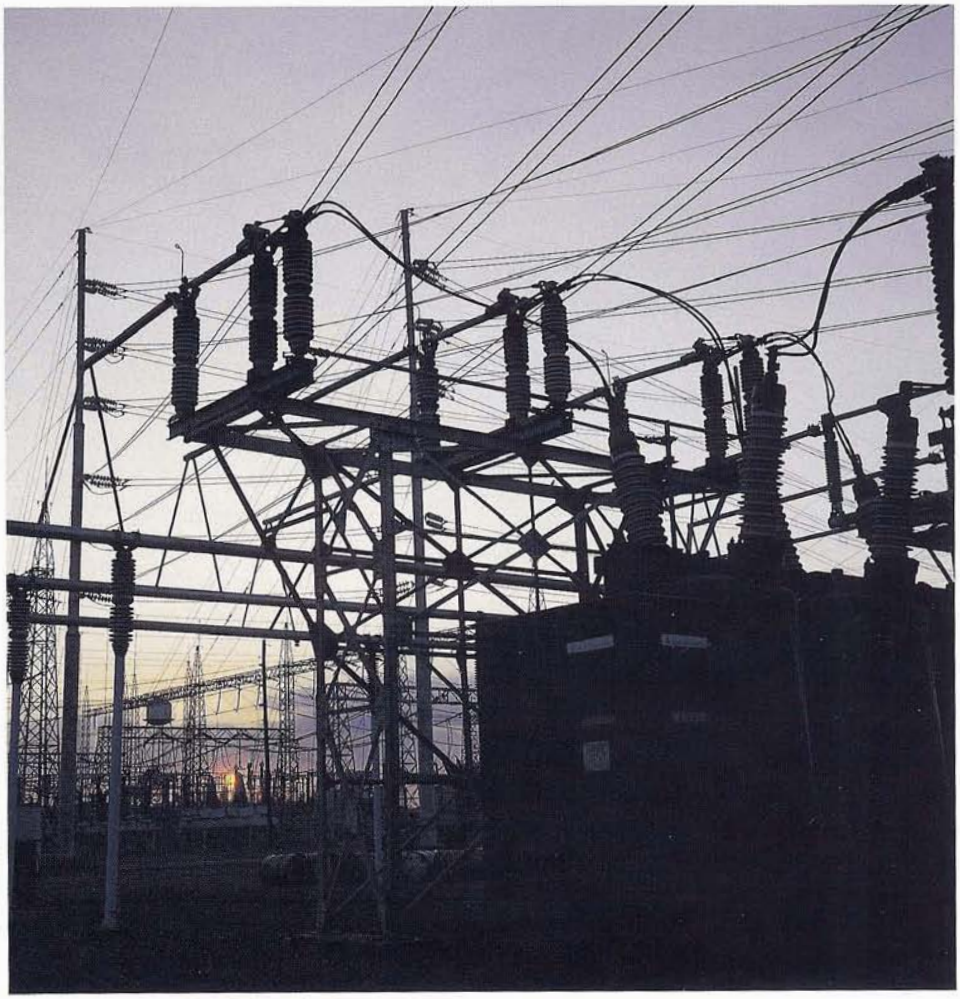
Industry: Utility

Partner: Computer Information Systems, Inc. (CIS)

Hardware: Compaq, IBM

Application: Sales tracking, accounting, and others

Informix Products:
INFORMIX-OnLine
INFORMIX-STAR
INFORMIX-4GL
INFORMIX-SQL



The Challenges of Power Distribution

For a utility company, the ability to provide a continuous supply of uninterrupted service is crucial. However, technical problems such as inferior workmanship and materials, inadequate power generation facilities, and lack of resources can result in power interruptions. The occurrence of natural disasters such as typhoons, floods, and earthquakes is another factor that can prevent continuous electricity access.

For Meralco, keeping power flowing to its clients is its top priority. The use of new computer technology is key to the company's strategy for

providing prompt and productive response to the customer's critical needs. At the same time, the new technology will bring Meralco closer to its customers as well as boost its international service standards.

Meralco Business

For over eight decades, Meralco has distributed electricity to Metro Manila and nearby provinces comprising its franchise area. The franchise area covers more than 8,000 square kilometers spanning 10 cities and 100 municipalities, including Metro Manila and the entire provinces of Bulacan, Rizal, and Cavite, as well as parts of the provinces of Laguna, Quezon, and Batangas.

Meralco has a total staff of 8,300 serving approximately two million customers 24 hours a day. It has a total of three main operating centers, four main service centers, and 36 branch offices. To service Metro Manila, Meralco has set up a main operating center and four service centers or distribution facilities.

The Reality of Customer Complaints

Customer Complaints Monitoring System (CCMS) is an information system that ensures complaint data are stored and immediately made available to all involved parties, including customers, customer service representatives, and field personnel. This requires information to be made available both at the local service center (where the problem is reported) as well as the main operating center, which is where most resources to attend to the problem are located. The speed at which the information concerning the customer's problem can be retrieved and transmitted is also a very crucial factor in determining the speed at which customers' complaints and problems can be addressed. Hence, the need for an efficient system to transmit the information.

Downsizing

Meralco decided to move the existing CCMS from an IBM system 3090 mainframe to five interconnected HP 9000 Series UNIX boxes for more efficient allocation of resources on the mainframe. One Hewlett-Packard minicomputer will serve as the central server; the four other minicomputers will function as servers for four local sites at each power distribution facility.

At the same time, after a number of years of use, a number of features and additional requirements from the system have evolved. These additional requirements would not be adequately met if the mainframe was to be used as the base hardware. The decision to downsize was imminent.

> “UNIX has grown from a mid-range system and is now performing with the same power as a mainframe. In the case of Meralco, an open systems solution provided by Informix's tools and servers exceeds that of our current mainframe, without the hardware and software limitations.”
>
> ***— Ricardo Buencamino —***

By the end of 1991, Meralco became the first company in the Philippines to implement an application downsized onto a distributed platform over a wide-area network.

"The four Hewlett-Packard system 400 relay terminals located at Laguna, Bulacan, Manila, and Quezon City communicate with the main CPU, which is a Hewlett-Packard system 433 at the company's main office in Pasig," says Ricardo Buencamino, project manager for Meralco. "These individual units are now capable of handling service requests on a sector level."

Open Systems Advantages

In downsizing, Meralco was clear in its decision to go into open systems — the advantages and flexibility that are inherent in UNIX operating systems are critical factors in the selection of a suitable solution. Informix, with more than a decade of experience on UNIX, was the vendor of choice.

"UNIX has grown from a mid-range system and is now performing with the same power as a mainframe," says Buencamino. "In the case of Meralco, an open systems solution provided by Informix's tools and servers exceeds that of our current mainframe, without the hardware and software limitations."

The Informix Solution

The Informix solution for Meralco has provided major advantages in at least three major areas: increased high availability, user friendliness, and improved functionality of the CCMS application.

System Availability

System expansion and availability are some of the advantages offered by Informix/UNIX solutions.

"The UNIX operating environment gives Meralco many options for networking and interoperability," says Buencamino. "One of the greatest advantages of a distributed database is that if the communication lines break down, all the off-site service center units may function as individual CPUs, just like the one in the main operating center."

For the old CCMS, when the mainframe CPU goes down, the entire system is down. The present system running on Informix software functions on a distributed mode. Hence, for the entire system to go down, all the five CPUs — located at different locations — would have to go down at the same time.

INFORMIX-OnLine, Informix's powerful on-line transaction processing (OLTP) database server for the UNIX operating system, provides the performance and high data availability to operate Meralco's CCMS 24 hours a day, seven days a week. OnLine's

performance comes from its utilization of a cost-based optimizer, shared memory, and direct I/O. Other features like on-line archiving, disk mirroring, and fast recovery mechanisms are other sources of OnLine's high availability.

The robustness of OnLine also means that data may be loaded back into the system for on-line retrieval. Meralco used to archive their CCMS data onto microfiche. While retrievable, this makes the search of a specific record very difficult. With OnLine, this is not a problem.

Ease of Use

The old CCMS application required that customer service representatives know several status and reference codes while preforming data entry and retrieval. However, with the use of Informix software, the customer service representatives can make use of pop-up screens that display tables of codes and their corresponding descriptions. In addition, the application development requires considerably less amount of code since INFORMIX-4GL is concise and English-like. This ultimately translates into reduced application development and maintenance effort.

A customer complaint is usually lengthy and a typical application would require multiple screens to display all pertinent information. However, the new version of the CCMS application in INFORMIX-4GL allows the customer service representatives to toggle between multiple screens, thereby providing access to all the necessary information simultaneously.

Functionality

The new Informix-based application allows the customer service representatives a great amount of flexibility for locating data from the CCMS database using query-by-example. In contrast, the old CCMS system limits the users to on-line inquiry of a specific record. This additional feature offered by Informix's software aids in prompt servicing of customer complaints.

The new CCMS also allows for easier report generation on customer complaints. This is possible with INFORMIX-SQL which allows the user to control and format the information returned from an SQL query. Customer reports that include data from multiple tables can be easily developed with very little programming.

Informix's client/server architecture also allows Meralco to distribute data and processing to the four other operating centers. In addition, the connectivity solution provided by the UNIX operating system allows the CCMS application to be easily interfaced with other existing PC-based applications.

The Future

A number of enhancements have been identified to further improve the user friendliness and system functionalities of CCMS. Other applications being considered are:

- System Control Subsystem (SCS). Currently, information on areas affected by a power breakdown is transmitted either through the telephone or through workstations located at the technical services building. In the future, the CCMS is expected to automatically capture switching data and do network tracing to determine the affected areas.
- Automated Mapping/Facilities Management Systems (AM/FM). Meralco is currently studying the linking of the CCMS with the AM/FM system. The idea is to allow customer calls and complaints to be appropriately tagged into the electronic map and for this same information to be retrieved at the operating center unit. ■

Corporate Headquarters and Americas Sales Headquarters

Informix Software, Inc.
4100 Bohannon Drive
Menlo Park, CA 94025 USA
415-926-6300

European Sales Headquarters

Informix Software Ltd.
Informix House
Littleton Road
Ashford, Middlesex
England TW15 1TZ
44 784 240 444

Asia/Pacific Sales Headquarters

Informix Asia/Pacific Pte Ltd
152 Beach Road
#04-06/08 Gateway East
Singapore 0718
65 298 1716

Informix Sales Offices

Australia
61 2 488 7088

Belgium
015 401944

Canada
416 730 9009

Czechoslovakia
011 422 350041

France
33 1 42 70 67 74

Germany
0049 89 96098 0

Hong Kong
852 8240981

Italy
39 2 95301055

The Netherlands
03402 74747

New Zealand
64 4 499 5511

Philippines
63 2 816 4867

Singapore
65 298 1716

Spain
34 1 372 98 00

Sweden
46 8 792 64 80

Taiwan
886 2 775 4352

United Kingdom
44 784 240 444

United States
800 331 1763

Printed in U.S.A.
000-20287-76

Corporate Headquarters 4100 Bohannon Drive • Menlo Park, California • 94025 • 415-926-6300
European Headquarters Informix House • Littleton Road • Ashford, Middlesex • England TW51TZ • 0784-240-444
Asian/Pacific Headquarters 152 Beach Road • #04-06/08 Gateway East • Singapore 0718 • 65-298-1716