

# Status

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QUARTERLY  
OF THE  
WESTERN  
AUSTRALIAN  
REGIONAL  
COMPUTING  
CENTRE

## Catalogue searches now a breeze for gallery

Antiques and computers may seem an unlikely mix but for one Perth company the combination has proved highly successful.

Claremont antique gallery Puritan Man has just installed WARCC-developed software on an Apple Macintosh system to tap into its catalogue containing interior design reference material.

Staff at Puritan Man use the catalogue to help pinpoint customer needs and to act as a resource centre for interior design services offered by the company.

Introduction of the WARCC software satisfies the company's need for a database that can rapidly track down customer requests for antique pieces.

Previous attempts to access the information using traditional databases had proved unsuccessful because of their rigid formatting.

Development of a more flexible database was assigned to WARCC senior analyst Dr Michael Wheatley.

Dr Wheatley came up with a database featuring a flexible search function that any staff member could quickly master.



*Puritan Man's Lucinda Hill checks items ready for cataloguing*

Customers can nominate specific antique pieces or more general categories and the system will conduct a rapid search for the desired items.

The search function takes its cue from partial words as well as complete ones in the search description and is therefore very forgiving of users. It can also conduct "and/or" searches.

Once the search has located its target, the customer is provided with details of the antique including a brief description, its location and whether it is in stock or sold.

The newly installed system is based on the HyperCard software package which can present information in a variety of formats, both written and pictorial.

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# Inquiry probes technology spending

WARCC played host recently to a parliamentary committee investigating how well the state's public sector spends its \$200 million a year computer budget.

The Public Accounts and Expenditure Review Committee toured WARCC's facilities and held discussions with management as part of a wide-ranging review of spending by government bodies on information technology.

Government expenditure on information technology is set to grow by 15 per cent in the next financial year and the committee has been examining the controls in place to ensure this growth in spending is "justified and cost-effective".

The six-member delegation from the committee, led by chairman Dr George Gallop, were keen to see WARCC's operational areas and to look at how the Centre balanced its statutory obligations to the university with commercial services to off-campus clients.

As well as examining the public sector's purchase and use of computer equipment - both hardware and software - the inquiry is looking at the role of key departments such as the Department of Computing and Information Technology, the Treasury and the Office of the Auditor-General.

It is also looking at staffing policies, especially former public service DP staff now carrying out consultancy work for the government. The committee is concerned about the way former public servants are used in acquisitions and applications development and their conditions of employment as consultants.

The committee is also examining more general issues such as government management of demand for information technology within the

public service, government decision making on funding computers and security and disaster contingency plans.

## ***Director's Desk***

A story later in this issue about the end of a 25-year line of computers is, for many who grew up with such machines, a sign of a major shift taking place in the way computer services are provided.

Fifteen years ago, the only service WARCC offered was use of its large time-shared computers. Now computer processing represents less than 10 per cent of the Centre's business.

This is not the end for mainframes. IBM is the largest computer company in the world and revenue from its sale of mainframes still exceeds the combined total of all other computer companies from micro computer sales. But in the technical world of scientific and engineering processing, I believe micros and workstations are taking over.

WARCC has been well aware of this trend and some years ago we set up our now flourishing micro-computer support unit. Furthermore WARCC is increasingly directing its efforts towards support services rather than acting as "custodian" of mainframes.

The shift towards micros and workstations has resulted in computer processing becoming much more widely available. However, the growth in computer technology has occurred at a time when the gap is widening between the power available from computers and the power

they effectively bring to bear on a problem.

Research conducted by a recent visitor to Perth, Tony Dunning from the Commission of the European Communities, is very salutary. He found that computer power installed in the industrialised world grew by a factor of 10,000 in the 15 years up to 1986 yet average worker productivity in those countries fell during the same period.

It is clear that assistance is often needed to make effective use of the computer power installed in workplaces. One of the aims of the Centre's Programming Services and Consulting Services divisions is to provide just that kind of assistance.

Even the Computing Services division, which is responsible for our bureau mainframe processing capability, is more concerned with customers' needs than what computer they use. The division has been investigating the use of large packages on workstation-type computers and they are well placed to advise customers about the most appropriate "platform" on which to get their work done.

WARCC is here to help, and believes it is moving with the times in order to remain as relevant and useful to its customers as possible.

*Alex Reid*  
Director

# Quality assurance needs more attention, industry warned

Government and private industry are spending an increasing share of their computer funds on software development but few are getting value for their software dollar, according to Terry Woodings, manager of WARCC's Programming Services division and one of WA's foremost specialists in software quality assurance.

Mr Woodings said development of software systems was very prone to waste and often the finished product could not be fully utilised or required extensive reworking.

"A recent survey of commercial systems of more than 64,000 lines of code found that just one per cent of software was on time, within budget and met all the requirements set by the customer," he said.

"The average program was more than a year late and cost twice initial estimates."

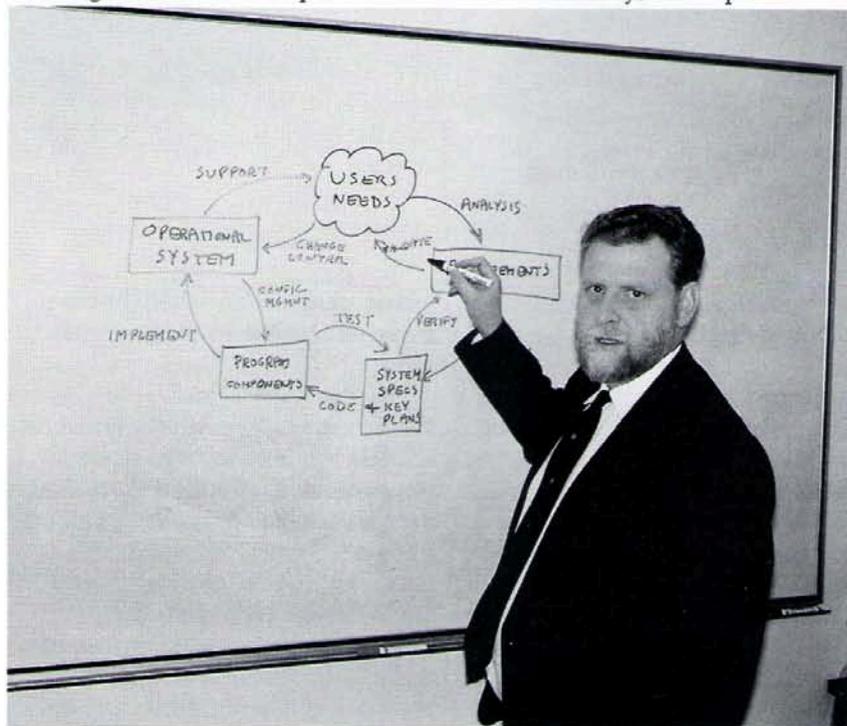
To reinforce his argument he points to another survey, this one conducted by the US Government into defence software, which showed that only about two per cent of the software could be used as delivered. Almost half was delivered but never used while 30 per cent was paid for but never arrived. A further 19 per cent of the software was used but reworked or later abandoned while three per cent could be used after modifications.

Mr Woodings said the use of software quality assurance techniques was undoubtedly the best way to overcome the problems inherent in developing software.

WARCC's Programming Services division runs a series of regular seminars and workshops on software quality assurance techniques. They are intended to meet in-house training needs as well as provide a

However Mr Woodings was quick to point out to those attending that the methods that would be discussed were generally well known and understood but infrequently applied.

"Instituting quality assurance techniques often formalises procedures that are perhaps being followed only half-heartedly," he explained.



Terry Woodings ... "quality must take a higher priority"

vital service to the computer industry.

A two-day seminar in August attracted 25 participants keen to look at the application of quality assurance techniques in managing software production.

He said introducing quality assurance techniques would cost developers in terms of additional time and money but the long-term result would be greater productivity, more customers and more repeat business.

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"Customers have four basic expectations about software development - the time it will take, the amount of money it will need, defining the job it is supposed to do and establishing how well that job gets done.

"Too often software developers neglect the final point - the quality of the job - and it is this oversight that is giving the industry its reputation for delays, cost overruns and unsatisfactory results."

The seminar examined nine basic quality assurance techniques - validation, verification, testing, configuration management, change control, standards, key plans, quality metrics and zero-defect development.

Mr Woodings said that putting these techniques into practice would enable software developers to answer such critical questions as:

- . how were customers' expectations determined.
- . what planning was needed for good software quality assurance.
- . how could validation, verification and testing be incorporated into life-cycle methodology.
- . how were acceptance tests for prototypes arranged.
- . how could configuration management assist with incremental software production.
- . what was the role of the quality assurance team.
- . what parts of which standards should be used.
- . how much testing was enough to prove reliability.
- . how could the quality of a system be objectively assessed.

Mr Woodings said that while the courses were intended for senior programmers, project leaders and software managers, anyone in-

involved in producing software was promised plenty of new ideas to think over.

He has been presenting his highly successful seminars and workshops on software estimation, project management and quality control for more than three years.

The seminars and workshops are based on internal courses held every six months at WARCC to

promote improvements in software productivity and reliability.

As well as offering quality assurance courses to government and the private sector, WARCC provides a consultancy service in quality assurance, arranges independent teams to assess quality assurance procedures during development of software and finally, provides assessments of the finished software product.

## Database to break new ground in road accident research

WARCC has won a job to develop a database for the State Government's new road accident prevention research unit, Roadwatch.

The database will be the first of its kind in Australia to combine details of road accidents from the Police, the St John Ambulance Association, hospitals and the Registrar General's Death Index.

Attempts by other states to collate such information have in the past floundered over the question of confidentiality.

But the unit's new director Dr Ian Smith said the issue had been dealt with by deleting any unique identifying details such as name, address and date of birth from the database.

Blanking out details will occur as information on the four databases is matched and the identity of individuals is confirmed.

However, that task is considerably

more complex than it appears, according to WARCC's programmer for the project Anna Ferrante.

She said records on the databases could not be matched readily since they contained few common features other than name, age, sex and address.

Clerical and typographical errors during data entry compounded the difficulties. Added complications occurred if the accident victim was a twin, had changed surname, was involved in the accident along with other family members or had a surname not easily distinguishable from the first name.

To overcome these problems Roadwatch decided to trial a Canadian software package known as GIRLS or Generalised Iterative Record Linkage System.

GIRLS works by looking among the databases for matching details on an accident victim. If enough details match, a definite link is formed. If

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## 'Wake' marks the end of the line



WARCC Director Alex Reid and Digital's Max Burnet at the handing over ceremony

WARCC's decision to decommission a DEC System 10 in June this year marked the end of one of the most dynamic early periods of computing in Western Australia.

Installation of the DEC-10 nine years ago maintained WARCC's unbroken line of compatible time-shared computers produced by DEC, beginning with the then revolutionary PDP-6.

In 1964 Digital Equipment Corporation was a computer manufacturer unknown even to many Americans and the decision by The University of Western Australia in that year to purchase one of its PDP-6s caused quite a stir. It was considered by many to be an extraordinarily brave move.

Time-sharing is such an accepted feature of large computers these days - even some micros can do it - that it is hard to remember the days when the only form of computing was "one-at-a-time" batch processing.

### By Alex Reid

Yet in 1964 time-sharing was something that happened only in one or two of the most advanced computing research laboratories in the world.

Delivery of the PDP-6 the following year to the university, the first customer in the world to buy such a machine, began the era of time-sharing - and in Perth of all places.

One of the most significant benefits of this acquisition was that it allowed a large resource to be shared by many disparate users from the convenience of their own offices. Thus the seeds of the Regional Computing Centre concept were sown.

When WARCC was formed in 1972 it inherited the PDP-6 but the following year it was succeeded by the KA-10, also known as the DEC10. It was the KA-10's successor, the KL-10, that WARCC decommissioned in June.

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there is insufficient similarity, a scale of weights is assigned to the details that do match in an effort to distinguish true links from mismatches.

Any links that still remain questionable are pulled out for manual checking.

Accurate data is essential for Roadwatch's research efforts and WARCC's use of the GIRLS package will ensure staff there have a database to work on that is almost completely error-free.

Roadwatch has been set up to research the cost-effectiveness of road accident prevention measures and to come up with recommendations to prevent accidents and improve emergency and hospital care. It will also encourage research by other groups using the database.

The State Government hopes the research findings will help reduce the carnage on WA roads. Each year more than 200 people are killed in road accidents in Western Australia while 2700 are admitted to hospital and nearly 8000 need medical treatment as a result of road accidents.

The database will initially contain details of all casualties for the 15-month period from October 1987 to December 1988.

Roadwatch is a project of the Department of Health.

The PDP-6 and its successors figured prominently in the growing convergence of the communications and computing industries. It was the first computer in Australia to connect to clients via telecommunications lines, the first to feature a remote batch

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# Market demand gets priority in reshuffle

WARCC is undergoing a major marketing shift in a bid to ensure its long-term viability as a leading supplier of computer equipment and services.

Senior management are currently implementing a number of initiatives that will signal a change to a more market-led approach to delivering computing services to universities, government organisations and the private sector.

The move is designed to ensure greater responsiveness to the needs of WARCC's customers and to expand the activities of all five operating divisions.

Co-ordinating the new marketing

push is assistant director Carole Herriman who says a general move away from centralised computing lies at the core of the Centre's change in direction.

"WARCC's traditional business of large-scale mainframe computing has become less viable as clients move towards smaller more powerful computers of their own," she said.

"This is especially the case with the university market where microcomputers are assuming a much larger role in meeting the computing needs of departments, staff and students."

Ms Herriman said the Centre faced a university market vastly different from the one it was set up in 1972 to service.

"Computing needs have changed dramatically, purchasing decisions are now more decentralised and discretion over where computer funds may be spent continues to grow.

"The proposed amalgamation of Murdoch University with UWA adds further impetus to the need for a concerted marketing effort on campus."

But WARCC has recognised that to maintain the viability of its university operations, it must look at new areas of activity beyond the university.

"The Centre is now looking to all five divisions to expand their roles and this means seeking out new ventures and new ways to market existing services," she said.

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station and the first to be the hub of a packet-switched network.

But advances in technology were not the only distinguishing features that made this family of computers at WARCC famous. Their 25-year presence at WARCC has helped produce some of the best computing people in Western Australia, especially those in scientific and engineering fields.

The decommissioning ceremony did not, however, herald the birth of another generation of DEC 10s since Digital has decided to discontinue the line in favour of its VAX computers.

Furthermore, WARCC has chosen not to introduce a direct replacement because the staple diet of the PDP-6 and DEC-10 machines - technical, educational and research computing -

is now more commonly done on personal computers and workstations.

WARCC has played a prominent role in this transition, selling micros worth nearly \$3.5 million in 1988. It expects sales to approach \$5 million this year.

Each of these micros has more memory and processing power than the original PDP-6 and in many cases approaches that of the recently decommissioned DEC 10.

But they do lack one ingredient - the camaraderie that comes with sharing the same resource. Perhaps Local Area Networks or electronic mail will be able to recreate that feeling but for many the end of the DEC-10 spells the end of an era in more ways than one.

One of the divisions, Consulting Services, was formed earlier this year to concentrate on consultancy work using the broad range of computing skills available at WARCC.

In some cases WARCC staff possess specialist skills in areas such as engineering and statistics as well as their computing expertise. Tapping those skills to provide clients with services not readily available elsewhere is an important priority for WARCC.

Ms Herriman said other recent changes included an expanded role for the Facilities Management division, the setting up of an Administration division to streamline WARCC's operations and greater promotion of the Sun range of workstations within the university market.