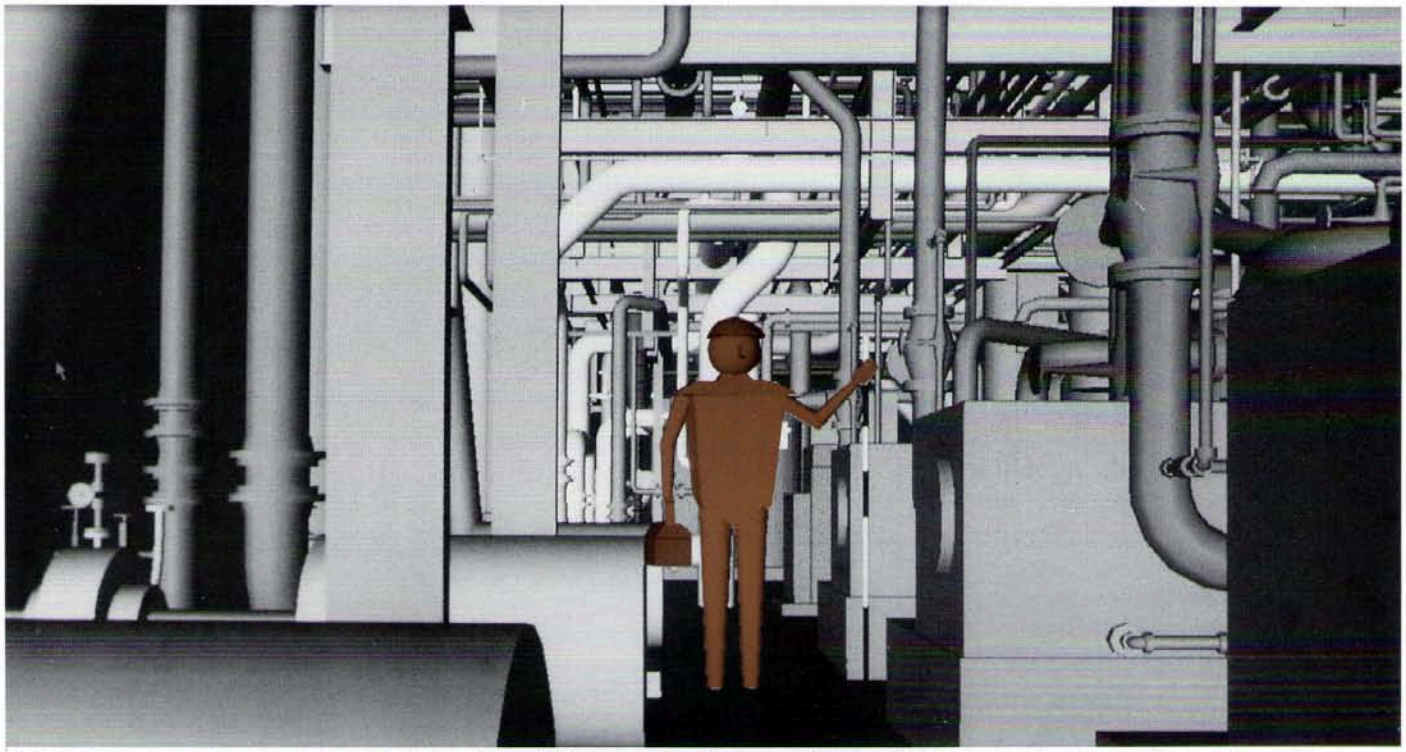
status

QUARTERLY OF THE WESTERN AUSTRALIAN REGIONAL COMPUTING CENTRE

AUTUMN 1989



REVIEW's interactive man option is the most dramatic feature of the software and allows the viewer to gain a sense of pespective of the plant.

Masterpiece in 3D

Although engineers have been constructing elaborate and costly models of their plant designs for decades to help visualise the finished result, still a degree of imagination was essential.

Now, thanks to a brilliant CAD technique known as REVIEW (Dynamic Interactive Model Review), engineers and their clients can examine and even "walk through" these complex models as fully shaded 3D computer images.

So impressive is this new 3D facility, developed as an adjunct to CADCentre's Plant Design Management System (PDMS), that it won a category of the 1988 Archimedes Award for Excellence in Engineering in the United Kingdom.

WARCC is now marketing REVIEW in Western Australia as an additional feature to buyers and users of PDMS. It is expected that the complementary packages will find favour with engineers in this State where there is ample scope for large scale plant construction.

PDMS enables engineers to solve the problems associated with plant layout, pipe routing and pipework design.

The interactive design module of PDMS allows plant designers to "construct" within a computerised database, a full-scale three dimensional computer model analagous in

Continued overleaf

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every way to a conventional plastic model.

Using PDMS, engineers can check pipes and branches to ensure that all connections are complete and have correct alignment, matching connection type and consistent bore. PDMS can also check for interferences to escape routes or clashes between structures, vessels, pipework, heating, ventilation and air-conditioning ducts and cable tray runs.

Now, with the advent of REVIEW, plant designers can go further and actually re-create their model in 3D, rapidly switching from a wire-line rendition to a fully-coloured, shaded representation of the model. This state-of-the-art software then allows users to "step inside and walk through" the model in real time, checking for optimum space management and design faults.

Potentially expensive site errors can be assessed during the examination and corrected subsequently in the PDMS model.

The "walk through" capability can be quickly defined to show significant views and areas within the computer model. An "interactive man" option can be selected from the menu and manipulated within the model to provide a sense of scale and perspective, and can be moved independently to the model view.

This ability to display a "man", two metres tall, and move him around to scrutinise any aspect of the plant from his point of view, is the most dramatic feature of the software.

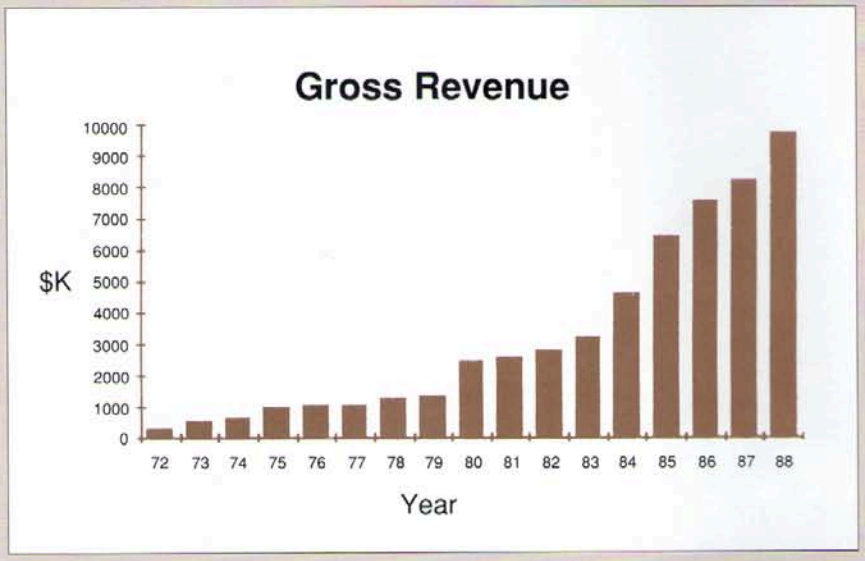
With its user-friendly interface, REVIEW can easily lure the uninitiated into believing that it is a very sophisticated toy, so absorbing is its capability.

Viewing of this remarkable software can be arranged - it is marvellous just to see and a first class example of leading edge technology in the 3D arena.

Interest in PDMS and REVIEW should be directed to Martin Ward or Richard Clark at WARCC, telephone (09) 380 2597.

Director's Desk

WARCC's Annual Report for 1988 has recently been prepared and submitted to the University's Vice-Chancellor (at this stage, for internal distribution only). It reports a record revenue figure for 1988 of $9.75 million, up over 18% from 1987 (see figure).



1988 saw WARCC's gross revenue increase by over 18%, to nearly $10 million.

This indicates a continuing strong demand for WARCC's services. But this hardly leads to complacency on our part. The computer industry is a fast moving and sometimes fickle one, so it prompts us to renew our efforts to make all of our services as worthwhile as possible. This will result, during 1989, in some internal restructuring and refocussing, which will lead to more relevant and better supported services.

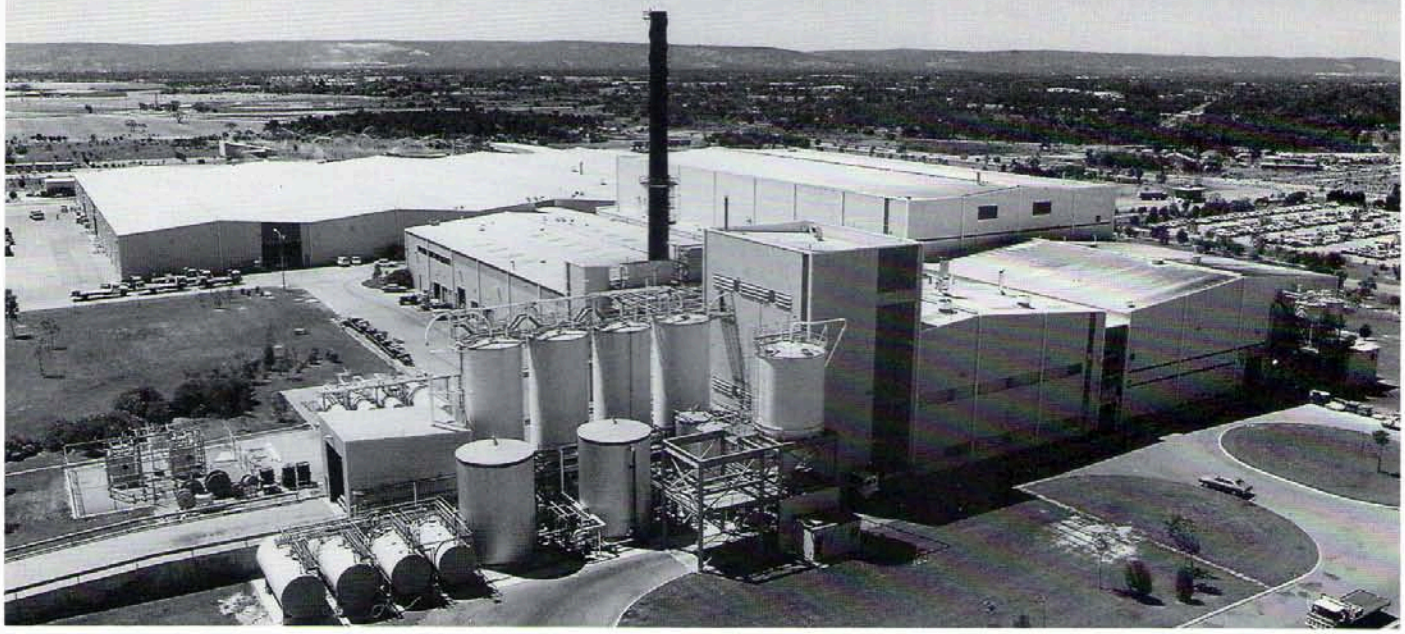
We are also very conscious that, over the years, we have relied almost entirely for the promotion of WARCC's services on "word of mouth". Clearly, this has been most effective to date, but we are acutely aware how little is known about WARCC or the services it offers. This is true even within The University of Western Australia, let alone within the rest of the public sector (all of which we aim to serve), or within those segments of the private sector to which we offer some unique (and often highly prized) services.

So another aspect of our endeavours during 1989 will be to find ways to promote an awareness of the valuable resource that WARCC represents to the Western Australian region.

This quarterly publication, *Status*, is intended, in part, to serve that end. *Status'* broader aims include showing some of the ways computing has been employed by others in Western Australia and to provoke a more effective utilisation of this technology, both within the public sector and beyond it.

Alex Reid, Director

Pioneering in Expert Systems Pays Off



The Swan Brewery's site at Canning Vale, Western Australia

Five years' research in the use of knowledge based systems has paid off for WARCC's Applications Group. The Centre has secured a commission to construct an Expert System for the Swan Brewery following interest by the company to utilise this state-of-the-art technology.

While several notable Expert Systems have been produced by WARCC to date, this will be the first major system to be built off campus.

Defined loosely, an Expert System is software that emulates a human expert. It is custom designed to capture the experience and "rule of thumb" judgements used by an expert.

Once captured on software, the knowledge is then permanently "on-call" to provide a continuity of expertise in situations where efficient performance relies heavily on the experience of particular personnel.

The store of knowledge can be easily modified and supplemented and the application of that knowledge continually refined. These factors provide the groundwork for a high-class training base and consistency in decision making.

The project for the Swan Brewery will involve three WARCC knowledge engineers being seconded to the company's Canning Vale site for about three months to study the expert's domain and document his knowledge.

The contract follows a successful course given by Applications staff to executives and technical staff of Swan. The customised course included a general introduction to Artificial Intelligence (AI)/Expert Systems; various Expert System languages including GURU, LISP and PROLOG; management of Expert Systems projects and further aspects of knowledge engineering.

Swan Brewery executives recognise that Expert Systems technology is still largely experimental but are prepared to undertake pioneering work with WARCC in this exciting new area with a view to reaping long-term advantages.

"We are always looking for technology which will help us," said Project Manager with Swan, David Fletcher. "It is essential that we optimise our performance in every way to maintain a competitive edge."

In constructing an Expert System, considerations such as: How can the important aspects of the problem be characterised? What concepts are needed to produce a solution? How can the knowledge be formally represented? What rules will embody the knowledge? How can the rules be validated? - must be addressed.

The knowlege engineers liaise with the expert to determine the important features of the problem and then build a prototype system on a small scale to test its validity before carrying on to complete the Expert System.

Though the technology of Expert Systems is still quite new to Australia, it is being widely adopted in Japan, especially in the area of Process Control.

Interest in Expert Systems should be directed to Terry Woodings, Applications Group Manager, telephone 380 2618.

Viking Software for Sea Structures

Norwegian SESAM expert, Kåre Vollan (right) with WARCC's Richard Clark

A Norwegian company with historic maritime involvement is now a world leader in a latterday software application for marine environments.

Since 1864 Det Norske Veritas has been evaluating ships for sea-worthiness and issuing certificates to that effect. While ship classification is still the mainstream activity of the parent Company, a wholly-owned subsidiary is now producing an engineering software system known as SESAM which is able to calculate a structure's response to loads.

Capitalising on the area it knew best, Die Norske Veritas has moved with the times in developing modern technology for the quality assessment of marine structures. Though there are a number of general-purpose finite element programs for structural analysis on the market , SESAM is particularly suitable for assessing offshore structures.

WARCC was a recent port-of-call for Kåre Vollan, Vice President, Sales and Marketing of the subsidiary, Veritas Sesam Systems. Mr Vollan was on an extensive world tour to promote his company's services and software system, SESAM and to introduce PROBAN, the probabilistic analysis program for reliability assessment.

Commenting on his company's leading edge in the off-shore area, Mr Vollan said, "Since our company specialised in ship classifications and offshore applications, that is where we know the market best. We are most strongly involved in marine environments and that is where we are market leaders."

As part of its comprehensive bureau services, WARCC offers the SESAM system which is currently being used by leading offshore oil and engineering companies worldwide.

In Perth, project engineers Davy McKee-McDermott are using the software in the design of the Goodwyn "A" oil rig destined for the North-West Shelf.

Using SESAM, engineers can predict how an offshore structure will respond to a load such as wave motion, and detect in advance any potential weaknesses and cracks which may occur in the structure. Design modifications can then be made before the structure is installed.

While SESAM is especially suitable for marine structures, it can also be used to evaluate many other kinds of structures, for example, cars, aeroplanes, bridges and buildings.

Interest in both the SESAM and PROBAN packages should be directed to Richard Clark of WARCC's Cybernet Services, Telephone (09) 380 2597.

SESAM'S little Viking

IBM Upgraded with Hardly a Ripple

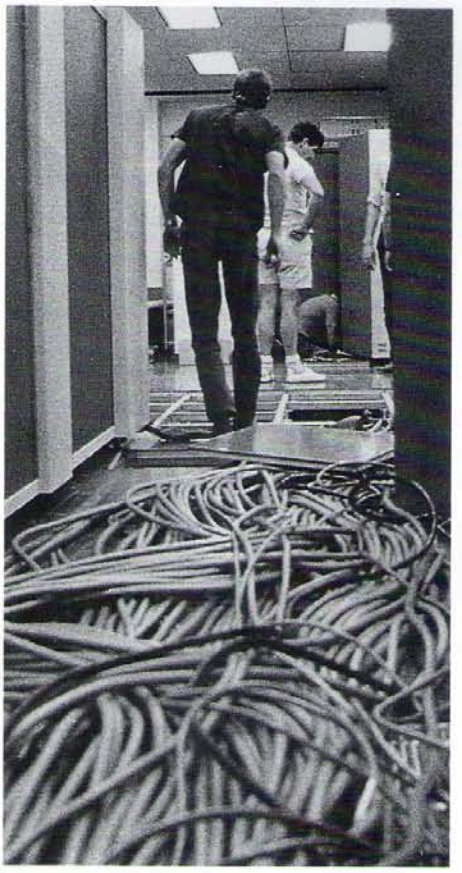
The installation of an IBM 3084 computer for WARCC's largest Facilities Management client over the Christmas period was a triumph for the team involved. These included IBM specialists, representatives of the client and members of WARCC's Facilities Management section.

With an incredibly low total "outage" time of just 10 hours, the complicated machine upgrade to replace two existing IBM computers not only went without a hitch, but also caused hardly a ripple of inconvenience to users.

The 128 megabyte computer, which came in two parts, replaces an IBM 3083 and an IBM 3081 which together provided 96 megabytes of memory. The larger and more efficient computer provides a much quicker response time to its users.

The upgrade was a sophisticated operation requiring about as much planning as a minor military manoeuvre and which presented more than a few challenges to WARCC's IBM Operations Co-ordinator, Michael Horton.

"At all stages during the operation we had a spare machine on the floor," said Mike, who had carefully planned the installation schedule and built-in this contingency in case of any malfunction.



The complicated installation of an IBM 3084 over the Christmas period was a triumph for the team involved.

The time chosen for the upgrade, from Christmas Eve to New Year's Eve, was decided after liaison with the client and its users to ensure that the work was carried out at a time which would cause the least disruption.

During the period, successive moves involved the synchronised juggling of machines and information, carried out with the utmost care and precision. The two older units were de-installed, one-at-a-time, and the information transferred first to one of the existing machines and then to the upgraded unit.

For a short time the system was still running on two separate (upgraded) machines but with the addition of extra hardware the IBM 3084 was soon operating as a single unit.

An innovative plumbing solution was devised during the procedure to supply the new CPU with chilled water. Rather than weld sections to the existing copper pipes to reach the upgraded, slightly relocated CPU, the chilled water contractor introduced flexible braided hoses with special "Hanson" snap connectors to link the existing chilled water pipes to the new unit.

After the final installation, the spare machine was then removed from the building to be used as a back-up facility on another site.

A memory upgrade to the IBM 3084 was more recently undertaken, once again requiring careful organisation. Several cards and extra modules have been added to the upgraded computer so that it is now running to its maximum capacity. This final procedure required a further outage time of five hours to users.

ET² Conference for Perth

Organisers of this year's National Conference of the Australian Computer Society are enthused that, after 13 years, Perth will again be the host city for the event.

Perth proved a popular destination with delegates in 1976 when the Society presented a very well organised conference, still regarded by many as having been one of the best.

WARCC Director, Alex Reid who has been appointed Vice Chairman of the Conference Organising Committee, says that the A.C.S. expects some 500 delegates to attend this year's event which will be held at the Burswood Resort and Casino from 28th August to lst September.

Alex expects the Computing Centre to have an active role in the Conference. As well as a number of WARCC personnel overseeing aspects of the organising, the Centre has already been involved in creating a data base of the names and addresses of information technology professionals in government and in finance and insurance.

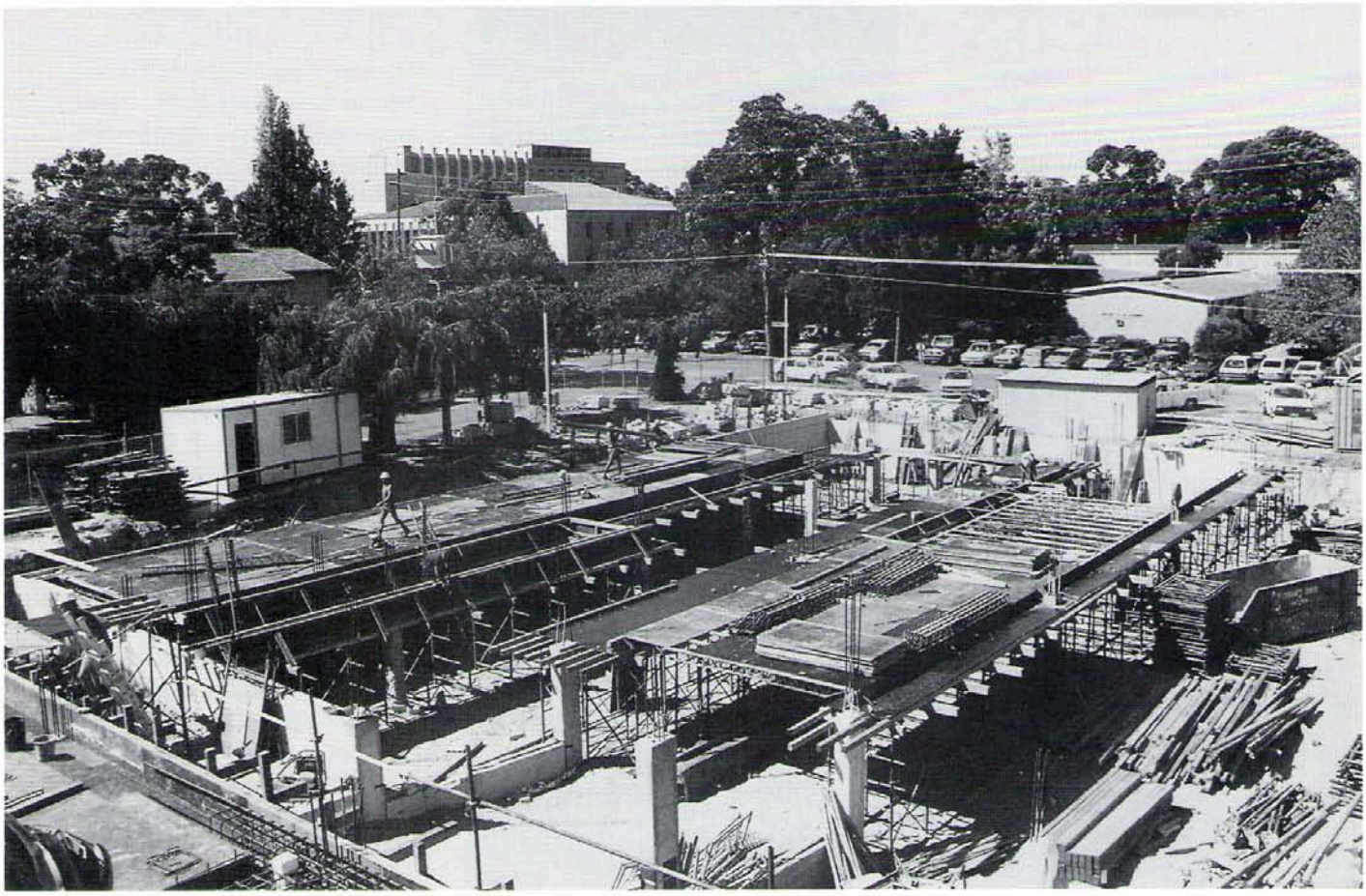
"We now have 3000 names on this data base which will be used for directed promotion," said Alex.

Many readers will already be aware of the coming event which has been dubbed ET². The major theme of the Conference is *Emerging Technologies and Techniques* (ET²). Supporting themes include *Information for Government, or Government by Information?* and *Finance and Insurance.* Papers are invited on any of the streams outlined.

A special flight deal to Singapore has been arranged so that Australian delegates can include that city on their itinerary for next to the same price as the East- West travel. A Post Conference meeting between September 4 - 5th has been organised by the Singapore Computer Society to enable delegates to take advantage of "add on" fares.

Contact the ACC89 Secretariat on (09) 322 6730 for details concerning ET² and travel arrangements.

A recent photograph of development taking place on the corner of Fairway and Edward Street, Nedlands. The new building, which will be jointly occupied by WARCC and the CSIRO, is expected to be completed late this year.



WARCC - There for the Asking

"WARCC is a tool - if you know how to use it, it can be a brilliant tool," enthused John Weaver who, over the years, has had a great deal of interaction with the Centre in connection with his sociologically based research.

John has recently resigned from his position as Senior Tutor in the Department of Industrial Relations at The University of Western Australia, to take up a new appointment as Employee Welfare Manager with Transperth in April.

Now in the final days of his PhD thesis on labour turnover, absenteeism and the behaviour of people working on the shop floor (ie the work place), John's usage of the Centre has come to an end.

He is clearly delighted with how WARCC has serviced his needs and was more than happy to give a few tips on how best to maximise the Centre's services and facilities (see overleaf).

"WARCC is perfectly geared to help a student or member of staff, if that student or staff member is willing enough to go across and ask," said John. "Knowing who to approach within the organisation is important: part of it is getting to know the people and getting to know the system. And WARCC people always take the time," he added.

"People at WARCC tend to look on customers with a human face. Certainly, WARCC is interested in business but it also has a dedication to its science which tends to lift it up amongst its competitors, " said John.

"They always say, "Gee, that's interesting" to your research. "There's an air of academia still left which encourages the budding student. In my experience, WARCC staff always take the time to help you thoroughly.

"In my work you have to use computers a lot," said John. "I couldn't have done my work without WARCC - it's as simple as that.

John Weaver, clearly delighted with WARCC's service over the years

"The degree of tolerance and patience with which WARCC people have assisted me over the years, such that I can now talk computer language, can manage statistics and can handle different software packages - that to me is a credit to them."

In his behavioural research carried out at various saw mills in the South West of the State, John had to set up a collection system and had tens of thousands of information cards which had to be punched up on the old system.

Going to the staff in the Punch Room (Data Preparation) was his first contact with WARCC and formed the basis of an on-going association which he effectively utilised to "cut his work in half".

"I found that by collaborating with the girls in the Punch Room before I undertook a piece of research, my questionnaires were prepared in a much better way," said John. "Before I commited myself to a piece of research, I always first made sure that the procedure that I intended to adopt was acceptable to them."

John has also found WARCC's Help Desk and Technical Services (Communications) team "terribly helpful".

He was one of the first to be able to input his data electronically rather than use the old method which was costing him much time and effort. This new system was devised for him by WARCC's Communications section in response to his request for a more efficient way to input data.

"From a customer's point of view, they were terrific. When I discussed my problem, their response was: 'O.K., We'll do it'," said John who concedes that communications were moving in that direction anyway.

Never-the-less, it was the attitude which impressed him, and the ready availability of expert staff, from the Director down.

WARCC SERVICES AND FACILITIES

Situated on the campus of The University of Western Australia, WARCC provides computing power and a wide range of related services for the University, education, government and the private sector.

Help Desk
Assistance and advice on all matters relating to the Centre's services are provided in the first instance through the Help Desk service. The Help Desk office contains manuals and documentation for the Centre's computers and programs for reference. Some of these may be borrowed or purchased.
Contact: Help Desk, telephone 380 2606.

Microcomputer Support
The Microcomputer Support Group provides rental and support services for Apple Macintosh, IBM PC and compatibles. Staff members and students of UWA and Murdoch University can purchase most hardware and software at a large discount.
Contact: Microcomputer Support, telephone 380 2621

Laser Typesetting
A high-resolution (up to 2540 dots per inch) laser typesetting service enables clients to transfer text and graphics from microcomputers and mainframes to the typesetter for producing high-quality printed material.
Contact: Microcomputer Support, telephone 380 2621

Graphics and Plotting
The Centre has a range of hardware and software to enable clients to produce graphics and plotting work. Hardware includes a large flatbed plotter, colour inkjet plotters, digitisers and graphics terminals. Software includes GKS and ARC/INFO.
Contact: Librarian, telephone 380 2627

Program Libraries
Collections of programs for a wide range of purposes are kept in program libraries on all WARCC mainframes. Program librarians can advise clients on the most suitable software packages for their needs.
Contact: Help Desk, telephone 380 2606

Programming and Applications Development
The Applications Group specialises in writing software for clients. Programs of any size or complexity are developed on client mainframes and microcomputers or on the Centre's machines. Programming languages include PASCAL, FORTRAN, C, LISP, PROLOG and MODULA. Recently, WARCC has pioneered the use of AI/Expert Systems techniques in software systems.
Contact: Applications Manager, telephone 380 2618

System Quality Assurance
Assistance is available in consulting and training on software QA and project management.
Contact: Applications Manager, telephone 380 2618

Training Courses
Training courses on various aspects of using the Centre's computers and services are held throughout the year. Courses include introductions to MS-DOS, SAS, and VAX/VMS as well as more advanced courses. Customised training courses can be organised on request.
Contact: Services Manager, telephone 380 2616.

Database Systems Development
Database programming for mainframes and microcomputers as well as consulting and design are undertaken at the Centre. A range of database software is available on the Centre's computers.
Contact: Applications Manager, telephone 380 2618.

Facilities Management
The facilities management service provides operations, technical and systems support for client computers. Contracts are arranged for the Centre to house equipment or to operate client installations.
Contact: Operations Manager, telephone 380 2603

Contract Consultation
Consultation and unbiased professional advice in all areas of computing and information technology are available at the Centre.
Contact: Services Manager, telephone 380 2616

CYBERNET Services
WA CYBERNET Services is a bureau service providing affordable access to specialised computer software for use in fields such as mining, construction and engineering.
Contact: CYBERNET Liaison Officer, telephone 380 2597.

Statistical and Survey Analysis
All stages of analysis are undertaken including questionnaire design, data entry, statistical analysis and data presentation with graphics.
Contact: Applications Manager, telephone 380 2618

Data Preparation
A key-to-disc data preparation service is offered by the Centre.
Contact: Supervisor, telephone 380 2601

Data Communications
Data Communications can provide advice on modems, other communications devices and terminals. Design and manufacture of customised communications hardware is also available.
Contact: Data Communications, telephone 380 2626

Technical Services
The Technical Services Group can provide systems programming and hardware support for a range of micro, mini and mainframe computers and operating systems.
Contact: Manager, telephone 380 2612

Networks
Through the VAXA computer, clients can access host computers on the AUSTPAC and international packet networks. Clients around Australia and overseas can access the Centre's computers via AUSTPAC.
Contact: Technical Services, telephone 380 2620

Electronic Mail
Through the VAXA computer, clients can access campus and international electronic mail services. **Contact:** Postmaster 380 2613

Research and Development
As part of The University of Western Australia, the Centre is a recognised research organisation. Eligible research projects contracted to the Centre can attract a 150% tax incentive.
Contact: Services Manager, telephone 380 2616

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