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**The Australian Computer Museum Society: the
role of multidisciplinary voluntary organisations
in modern industrial and socio-technical history.**

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The Australian Computer Museum Society: the role of multidisciplinary voluntary organisations in modern industrial and socio-technical history.

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ABSTRACT

Computers and information processing have, in the course of two generations, moved from being a highly specialised and largely secret technology to powering a fundamental empowerment of the broad community. This has been a shift from a few highly specialised installations to where the average new home computer configuration has now become more powerful than the average computer bought by business. The first generation from roughly 1945-1970 saw the establishment of government and business data processing, but the generation covering the period from 1970 to date has seen the democratisation of information and information processing power and a substantial shift from calculation to communications and symbolic processing. This social sea change has been signalled by a small number of early adopters, largely amateurs and voluntary organisations. Computing is a very fragile technology in historical terms, as the hardware on its own is largely symbolic of the history, and the major importance lies not in the engineering but in the combination of software and hardware that was required to realise the systems as a whole. The shift from hardware to software comprising the major contributions in computing has not been matched by the capture of the software and the ability to deploy it depends on what is now historical hardware. The enthusiasm and competence to enable the old hardware to run the software written for it, and to ensure that the old hardware can actually be operated successfully to do so is a major mission for voluntary organisations such as ACMS. While the formal recognition of the need to capture hardware, software and oral history of the computer and software era is being slowly recognised, a major part of the knowledge and expertise lies with voluntary organisations. The ACMS is working to ensure that hardware, software and the expertise to capture and document computer history is undertaken in time, and before the fragile magnetic media fades. A WWW site has been set up for Virtual Curators to make common cause to be made with modern historians and sociologists, with the disciplines of computer science and engineering, information science and software engineering. The enthusiasm, expertise and communications competences that can be marshalled through voluntary societies such as the ACMS has a major catalytic and action role which complements the celebrations of the start of Australian computer history.

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Context

- The rate of change has been very rapid
- Machine-dependent records
- Records require operating old computers
- The hardware and software are vanishing
- People are a key component of conservation
- Modern history includes social impact
- How do we capture the essence?

Computing software and hardware have maintained a very high compound rate of growth for many decades. This rapid rate of growth means that - after the earliest systems such as CSIRAC and SIRIAC - the hardware and software - of the next generation of early systems were comparatively small in number, and the written and printed records are very limited. Even when the curve hit the hundreds of thousands in the early 1980s, this growth has left much of the software and hardware in the disposal bin.

The software required to operate these systems was tied to a large extent to the hardware itself, until standards began to emerge in the form of magnetic tapes and 8" and 5" format floppy discs. Much of this software and documents created using software held on these and other formats, were not transferred to storage media formats readable by the successor generation of systems.

The importance of the people and the software in the creation and use of computing equipment is often ignored: however the entire culture, application and communication of the skills that made computers actually operate and solve problems. The problems themselves, the individual styles of addressing the tasks and the takeup of the results are distinctively different. The memories of the people involved are a vanishing but major aspect of computing. - and a major conservation issue to be addressed in modern industrial history.

Computers in context

- Initially rare, expensive, secured and centralised (Mainframes)
- Next, widely available at Departmental level (Minis)
- Then, the personal computer as a technical hobby (Altair, S-100)
- Latterly, personal computing as information power and control (TRS80 to Mac/Ibm PC)

Computers have changed their role as they have improved in capability and reliability, and increased in number. The public perception steadily altered as this process proceeded. The CSIRAC period was one of inaccessible computing and a numerical calculation orientation. The users were as a result mainly the engineers, mathematicians and scientist who could obtain direct access. Few of these have remained, CSIRAC was one of them.

Although this changed as financial and business applications expanded, but the next major general change was to accessible smaller ('mini') computers when more than one computer in an organisation become common. The personal computer emerged at about the same time (Altair etc), but was the province of the technical and electronically skilled users, thereby recapitulating much of the early mainframe history. The first electronic bulletin boards emerged as the purely technical aspects of these machines were mastered, the first in the southern hemisphere being constructed by the Micro Computer Club of Melbourne (MICOM) in the early 1980's.

After several partly-successful starts (Apple[, TRS-80, Commodore Pet...) IBM and Apple made machines that established a totally new market of broad-band truly personal computers. The broad access to personal information and control is still mediating social change, and is already in a second wave through easy many to many communication through the Internet

Computer museum roles

- Obtain and conserve hardware
- Obtain and conserve documentation
- Obtain software and **make it workable**
- Integrate hardware, software to function
- Bring together the hardware, software and knowledge to recreate the experience
- Place the capacities and capabilities in their social context

A computer museum cannot be a simple collection of pieces of hardware. A computer is a combination of hardware, software and programs - and has little significance without some understanding of the problems to which they were applied, and the context in which they were used and viewed.

A museum should therefore aim to secure hardware, software and documentation - and make the whole system work. This requires storage systems to be functional, and the storage media to be functioning.

This is a demanding set of goals, and the tasks to be addressed to make a functional computer museum are well defined. An acquisition policy is needed, and the necessary materials located and secured. Storage must be secured, The equipment must be restored otherwise made complete and functional, and the system brought into operation so that it can access its own machine-specific software and execute programs.

The roles of museums that are less obvious to the public at large are the function of recording and integrating the social context in which the computers were operated and contributed (or not, as the case might be).

The construction of displays for educational or public display requires all these tasks to be undertaken, although it is not usual (at present) to have the display containing functioning older computers, for the practical reasons of maintenance and security - and the equally problematic issue of manning such displays for interchange with the interested public involved.

Tasks

- Acquisition
- Storage
- Restoration
- Bring into operation
- Record and integrate social context
- Communicate this to the community

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Who has a role in creative conservation?

- Official conservation bodies
- The computer and software industries
- Official educational bodies
- Voluntary organisations
- Individuals

The tasks and goals for a computer museum are demanding, and knowledge intensive. Who should take up these roles and tasks? Are there any groups or organisations able and willing to share in these tasks?

Official conservation bodies do exist - but tend to look towards conservation of the physical aspects of the computers. This is a valuable, but incomplete role. Museums such as Powerhouse and Scienceworks tend towards this model, due to storage, display space and curator resource limitations.

The computer industry itself has not proved to be very responsible conservationists, with major individual exceptions such as Digital (who have an official Museum Curator in Max Burnett: another of the founder members of the ACMS).

Educational bodies have generally not taken the initiative, although individuals have been active sporadically. The future seems most likely to be secure in the hands of voluntary societies and of individuals, complementing the formal museums. Many individuals have collections of equipment and software, and the skills to operate any of these machines, and the ACMS is a voluntary society aimed at filling these emerging gaps.

Information access and control

- CSIRAC etc for computation and cryptography
- Leo etc for financial management
- Burroughs for high level languages
- Unix (AT&T) for communications
- IMS etc (IBM) for databases
- Personal computing for personal information access, management and control

There are many different ways of organising and selecting significant computing systems. It is important to note that some of the major conservation needs are for significant pieces of software, only some of which can realistically be conserved in a functioning form due to both systems and copyright issues.

One possible axis is the progress from pure computation and cryptography (CSIRAC is in this category), through broader-band microcoded business-oriented machines such as the Leo, on to machines with high level languages as the basic structure (such as the Burroughs series of machines).

This perspective then shifts to a software orientation, with Unix and large scale databases becoming more important than the machines on which they run, and then on to a recapitulation of the process as personal computers progressed through the same cycle again at a vastly accelerated pace and a far wider penetration into the community.

At each stage the impacts are different, and affect a progressively wider and wider community.

Many other perspectives are equally appropriate, but this illustrates the diversity of display and themes possible once a software+hardware+social view is taken.

Virtual curators

- <http://27/11/02/www.csirac.edu.au>
- Virtual Curator requirements to be met
 - house and make operative a specific system
 - prepare a web page to describe and display it
 - to pursue relevant contextual information
 - to communicate and support others with the same types of system

The combination of voluntary and formal organisations offers a positive and creative series of opportunities. The most significant is the possibility of a Virtual Curator, who could who will usually be an individual with a strong interest in a particular historical machine, keeping it operative with software and knowledge.

A Virtual Curator is a concept which directly addresses the problems faced by formal museums. It ensures that the physical storage problem is alleviated, the scarce human resources of the museums are complemented by individuals with the interest and skills required, and also creates a basis for a clearinghouse to ensure that old machines are not simply stored and forgotten.

An essential component of a Virtual Curator process is a networked communication required to ensure access, display and discussion on the exhibits. The ACMS in Victoria has been donated a Sun3 on the Latrobe University backbone by the Department of Computer Science and Engineering to host a World Wide Web site for Virtual Curator members of the ACMS and its affiliates to install their displays, and handle communications with interested parties, and provide a basis for the clearinghouse for interested individuals to participate in the curation, communication and conservation processes.

Qualitative research

- Working systems are only part of the story
- Conservation, archiving and recovery of records on obsolete media
- Development of educational material
- Interviews and other records of social and personal contexts of such systems
- Cooperation with archivists, librarians, sociologists and historians

The role of a curator is ideally considerably more than that of a storage clerk and cataloguer. Bringing up working and documented systems is only the first step in effective curation of such community assets.

Archivists and librarians are increasingly encountering very real problems of lack of access and storage integrity to some of their master records held on computer readable media. Access to these materials - often unavailable in any other form - requires computing systems capable of driving the obsolete or obsolescent storage devices, and running the software required to retrieve the information. In areas of data storage there are now many key numerical data sources held in such totally inaccessible formats as compressed SPSS system files written by the offbeat CDC Cyber series with their peculiar character and word representation conventions. These are typical of historical master archives rendered useless by the passage of working systems and software. Operating systems and software typical of the period reveals a great deal about the era in

which the systems were used, and is a basic component of the educational and historical record. Only an active museum society can hope to keep a wide range of such skills in currency. The rising roles of historians, cliometricians, industrial economists and sociologists in interpreting recent history also stimulates a need for a major and active involvement in such associations, and participation and support of such qualitative and quantitative research is becoming a prime (yet still currently largely ignored) function of a modern computer museum or society

Partnership

- Virtual Curators bring expertise and storage
- WWW provides a communication nexus
- The WWW offers a complete display capacity for text, film clips, pictures etc.
- The modern history and the science and social historians that lends such depth and value to this activity can be brought together through this framework

The framework of Virtual Curators and the WWW communication and display policy provides a constructive and highly effective method to address some of the current problems of formal museums when dealing with information technology.

The skills of display and information assembly on line can be combined through the WWW to realise an active partnership with the museums. The community concerned with the fragility of computing records and history are not limited to technical, business and scientific people: sociologists and historians are also becoming actively involved. Modern history has a high and increasing dependence on computer records, and the impacts of computing systems over the last half century have become pervasive and fundamental. The development of these impacts and changes, and the roles of individuals in both the technical and the usage of computers and software to manage information as well as computation is moving inexorably to centre stage in modern history.

The ACMS sees an expanding partnership between museums, industry, education, voluntary organisations and individuals - and the Virtual Curator and WWW communications support will be a major contribution towards making the efforts of all more effective.

d considerably beyond what most museums could resource - but is clearly essential if the full computer is to be seen in its entirety. The Boston Computer Museum is oriented towards the hardware conservation model, with display of more recent equipment.

However, given the problems of researching the more active model of a museum, which requires substantial expert manpower, the active model is probably increasingly beyond the reach of most museums, and even most specialist collections. The key resource is the knowledge and expertise to keep the combination of hardware and software actually operating. Clearly a new model is needed for a fully functioning computer museum.