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INFORMAA QUARTERLY

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Editorial Notes

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Cover photograph : Computer assisted records management at BHP's new premises, Bourke Street, Melbourne.

CONTENTS

		Page No.
Editorial		2
RMAA Contacts		3
State News		4
Letters To The Editor		9
Member Profile - Philip Taylor		11
Federal Education Report	D.G.Wheeler	14
Information Industry Leaders Pledge Concerted Action for "Clever Country"	Graham Dudley	17
The Archival Document - A Commentary	Philip Taylor	20
Document Imaging and Electronic Document Interchange - An Overview	Gerry Mackenzie	22
Electronic Records: Issues Facing the Australian Archives	Dagmar Parer, Steve Stuckey, Andrew Wilson	31
Electronic Data Interchange (EDI)	Nigel Charters	36
Computer Viruses: An Overview for Records Managers	Patricia Graham Roy W.J. Kenney Jih Ashok Roy	41
Records Management and Automation	Clive Finter	47
Electronic Record-Keeping in the MMBW	Carolyn Theodore	51
Diary Dates Around Australia		59
Facsimile Technology: Its Nature and Effect on Records Management	Lisa Poulier	60

EDITORIAL

In any organization, regardless of its nature, critical processes occur regarding information received and generated. Like living organisms, organizations require the 'life' of information in order to function and to continue to exist.

An important element in this process is the role that documents play. The document is the physical resource critical to the success or failure of implementing an information system. Documents contain the vital information required by the organization. By not having documents, decisions cannot be made with any certainty, communications become difficult, and the evidence of what has been done in the past does not exist.

The basic building blocks of any good document management system are systems, organization, management, decision-making, planning, communication, technology and people. The need to manage these processes effectively and to arrive at soundly based reasoned judgements on what to do about an information problem depends on other links. For instance, the need to select only timely, accurate and relevant records for processing, the need to update technology continually, and to select and retain the best qualified people to work the systems are just a few.

The last two Annual Conventions of this Association have attempted to focus attention on the importance of records management as a part of the broader information management world. But is there a danger for records management in trying to be included in this area when information is such a difficult concept to define? Another element is that records management is undergoing a revolution of its own and is still seeking to establish its own identity and direction. By mixing it in the big arena are we in danger of being subsumed?

To be included in the information management world means that those given the responsibilities of managing records have to come to terms with the wider issues, those more associated with being a manager rather than a controller of records. Such issues include increasing the

effectiveness of the corporation through justifying the continued existence or commencement of a records management function and increasing management and employee productivity. As the politicians have adopted the cry of the "smart country" it can already be seen that changes to traditional jobs have occurred through multi-skilling and amended work practices.

To justify your existence, will depend upon more than claiming that records management is part of the information management process. Questions to be asked include how does it contribute to the organization, what effect does it have, can costs be reduced, can productivity be increased, does the function dovetail into other information resource issues, how accurate is the system and what are the tangible benefits of effective record management practices. Once these questions have been answered to management's satisfaction, only then can it be claimed that records management should be considered to be part of the wider information world.

While the waters of records management may be muddled with information resources it is clear that considerable work remains to be done or we may lose our way in the information maze.

One significant aspect affecting the future shape and direction of records management is the ever increasing array of information technology within our environment. This issue of *Informaa Quarterly* explores some of these technologies with its theme of Electronic Records Management. Articles are informative and also give us some idea of some of the issues, problems and opportunities in information technology that we should be considering right now. This theme will be explored further in future issues of *Informaa*.

* * *

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* * *

NOTICE REGARDING CORRESPONDENCE TO THE ASSOCIATION

Any matters which require correspondence to either State or Federal Council should be directed to the respective secretarial position.

In some instances, failure to adhere to this normal business practice has resulted in delays in replying to the correspondence and, in fact, has prevented early replies on very basic matters.

These positions were created to prevent this type of problem; ensuring that all correspondence was officially logged, actioned and replies forwarded.

All members of the Association are reminded that this simple procedure should be followed to ensure prompt action.

One single point of contact will prove to serve members more efficiently in the long run.

**Murray Stewart ARMA
Federal Secretary**

* * *

STATE NEWS

ACT

At the July Branch Council meeting, the following people were elected as office bearers for 1991/92

President	Ross Thompson
Vice President	Kate McCarthy
Secretary	Yvonne Tanks
Treasurer	Julie Lenson
Registrar	Lesley Boye
Education Chairperson	Thomas Kaufhold
Workshop Coordinator	Arthur Langford-Smith
Councillors	Elaine Eccleston Sandra Fabbo Denise Druitt Valerie Parker
Federal Directors	Ross Thompson Thomas Kaufhold

The Branch is involved in two projects with students at the University of Canberra. We have proposed sponsorship of an award for students undertaking the records management units in the Degree in Office Management. We have also agreed to provide sponsorship towards a publication, initiated by the students themselves, aimed at advertising this course amongst the business community. We hope that these sponsorships will encourage more students to undertake courses in records management in the future.

The marketing survey is progressing well and MAP Market Discovery will, by now, have made contact with most of those members randomly selected for completion of the questionnaire. The Association will be using the results of this survey to guide its promotional activities, events and publicity over the next few years.

Upcoming events over the next couple of months include:

13 August 1991

Managing Electronic Data
Presented by Ms Brenda McConchie
Department of Housing, Health and
Community Services

8 October 1991

Voicemail and Electronic Mail
Speakers include representatives from
MRE Australia
Telecom
Honeywell

Hope to see you all in Darwin!!

* * *

NEW SOUTH WALES

NSW Branch conducted its Annual General Meeting on 10 July 1991, preceded by an enjoyable 3 course meal at the YWCA. The first of the 1991/1992 Branch Council meetings was held straight after the AGM at which the following Branch Councillors were elected to office

President	Chris Fripp
Vice Presidents	Richard Browne Allan Yeates
Secretary	Peter Beacroft
Treasurer	Jeff Webster
Federal Directors	Chris Fripp Peter Smith
Committee Chairpersons:	
Education	Peter Smith
Status and Standards	Alan Yeates
1992 Convention	Fiona Meyer

It has been heartening to see a number of "new" Associates nominating for Council and bringing with them a high degree of enthusiasm and energy when promoting the Association through Council activities.

Over the last 6 months NSW launched a campaign to increase the number of Associate members.

Congratulations are afforded to the following members who have recently obtained 'ASSOCIATE' status:

Peter Beacroft	Vince Veness
Keith Watson-Dyball	Jeff Webster
Lesley Dawson	Trevor de Groen

9th National Convention, 1992

Branch Council have recently adopted the Hilton, Sydney as the venue for the convention. Planning for the convention is going very well with most speakers confirming their attendance and agreeing to the topics suggested.

* * *

NORTHERN TERRITORY

There is very little new to report, as the almost total energy of the active Branch members is being dedicated to the organisation of the 8th National Convention in Darwin from 15-18 September 1991, which is frighteningly close now! Nevertheless, everything is coming together, and we believe it will be a Convention not to be missed. A revised program, including speakers and a synopsis of their papers, has just been prepared, is being printed, and will be distributed in a couple of weeks. It is different from the Programs of past Conventions, and should offer some pearls of wisdom for all professional groups within the information management field.

The Annual General Meeting for the Branch will be held at the Northern Territory Archives Service on 31 July 1991, with the election of Office Bearers to take place on 14 August 1991.

We look forward to seeing you in Darwin in September. Don't forget a hat, sunscreen, bathers and walking shoes - it's an endless summer in the Top End!

Judy Watts
President, NT Branch

* * *

QUEENSLAND

Queensland Branch will be participating in the Brisbane Careers Market again this year. The market will run from 4-7 August at the Brisbane Entertainment Centre.

Work commenced in May on the construction of a new building for the Queensland State Archives. The \$21 million special purpose building at Runcorn, 10km south of Brisbane replaces an existing building used by the State Archives since the mid 1960's. The building will provide 12,500 sq metres of space over 3 levels offering the latest in modern archival storage and research for all types of records. Work is scheduled to be completed by 1993. (See photograph below)



Sketch of the planned State Archives building at Runcorn, Qld.

The Electoral and Administrative Review Commission (EARC) noted in its report of Freedom of Information that FOI legislation would impinge on current activities of the State Archives. EARC formed the view that FOI legislation should complement existing legislation in relation to access to documents held by the state archival authority and undertook to commence an inquiry in the later part of 1991. The Branch Council will be keeping a close watch on developments with this review.

FOI legislation is expected to become operational in the public sector in April 1992.

Wendy Preston
President, Queensland Branch

* * *

SOUTH AUSTRALIA

A very successful "Managing Electronic Records" seminar was held on 5 June at the Hindley Parkroyal Adelaide. Among the impressive list of speakers were

Jan Gessin - Executive Officer, EDI Council of Australia
Euan Miller - Director, State Records and Information Policy
Denis Patriarca - Director, State Systems

The Annual General Meeting was held on July 8 at the Earl of Zetland Hotel. 14 associate members accepted nomination for Branch Council. Associate certificates were presented to

Rosemary Gabel
Helen Schoder
John Dippel

At the first Branch Council meeting for 1991/92 the following associates were elected to executive positions

President - Helen Francis
Secretary - Helen Schoder
Treasurer - Brigitte Stephen
Registrar - Andrew Wood

Peter Crush has not accepted a nomination to Branch Council for this year. His experience and knowledge will be greatly missed. Peter has been a member of Branch Council since 1977. Thanks to Peter, SA now has a certificate course in Records Management available at a TAFE college. His contribution, especially in the field of education is invaluable. Thank you Peter for all your efforts over the past years.

The Comtec 91 Exhibition of Computers and Business Technology will be held at the Exhibition Hall from 6-8 August. A wide range of computers and software will be on display; records management software packages seem to be few and far between.

The SA contingent is looking forward to meeting old and new comrades in Darwin in September. See you there.

Brigitte Stephen
Treasurer, South Australian Branch

* * *

TASMANIA

A Certificate level course in Records Management commenced during July 1991 at the Hobart Technical College. The syllabus for the course has been developed by a working party consisting of RMAA Tasmanian Branch Councillors, records managers from Commonwealth, State and local governments, Union representatives and TAFE representatives. The Tasmanian Branch has been working for the introduction of a local Records Management course since its formation in 1986.

The Tasmanian Branch Councillors for the year 1991/92 are

Tina Howard - President
Jill Saunders - Vice President
Debbie Stokell - Secretary
Ray Taylor - Treasurer
John Behrens - Federal Director
Dennis Wheeler - Federal Director
Jane Weston
Bill Taylor
Kerrie Pieters
Patricia Wichmann
Helen Atkins
Susan Hill
Kathy Holland

During May, June and July the Education and Training Committee conducted four training courses entitled from the "Cradle to the Grave", covering all aspects of records management from creation to disposal.

A seminar held in June, presenting case studies on vital records was well attended.

A Committee has been formed to commence planning for the 1993 National Convention to be held in Hobart. The Chairperson of the Convention Committee is Kathy Holland.

The Tasmanian Branch has had an active and successful year during 1990/91. We look forward to more achievements in 1991/92.

Tina Howard
President, Tasmanian Branch

* * *

VICTORIA

During the last three months the Victorian Branch has been involved with a number of important issues, issues which will impact seriously on the information resource industry.

The Victorian Branch has had an active participative role with the issue of amendments to the Public Record Act 1973. Our Councillors are in the process of addressing the impact of the proposed amendments to both the Premier and the Leader of the State Opposition.

The recession hitting Victoria will definitely leave it's mark. The State Government is looking at retrenching and redeploying thousands of Public Servants. In an effort to keep the figure of unemployed down, the State Government is proposing to redeploy a number of these into the field of records management. The proposal is to conduct short courses at Prahran College of Tafe as part of the retraining program. The Victorian Branch is actively campaigning to ensure that this manoeuvre does not turn back the clock to days when records management was seen not as a bone fide profession, but merely as a routine job to be carried out by anyone. The Victorian Branch will keep all members informed of the outcome of both issues.

The Victorian Branch Local Government Chapter is drawing closer to becoming a reality thanks to the tireless efforts of both Kay Lewis and Rod Biggs. By this time next year we should have a fully functioning chapter.

The Branch Annual General Meeting was held on the 25th July. The event was held at the new BHP headquarters and included a fine selection of speakers.

Rosemary Kaczynski
Secretary, Victorian Branch

WESTERN AUSTRALIA

The end of another year! It could even be the end of an era in Western Australia, only time will tell.

The resignations of three Councillors for varying reasons in December and the cancellation of our Seminar 'Storage Media and the Law' in February were our lowlights. These disappointments were far outweighed by many strong and positive objectives put in place throughout the year by our Council.

Our membership grew by 9% to just over 200 which makes us the fifth largest Branch, just behind Queensland and the ACT.

During the year members had the opportunity to attend functions at Brambles, Fremantle Port Authorities, Brisbane - 8th National Convention, Microforms and the Annual General Meeting held last month. They were also invited to combined functions with the Australian Computer Society to hear an address on 'The Imaging Productivity Opportunity' at an early AM - Breakfast timeslot and with AIIM (Formerly the Micrographics Association of Australia) to hear 'Register 2000' a new Optical Disc Based Document Imaging system implemented at the Office of Titles. Further combined functions are planned for 91/92.

Our Branch formulated a Mission Statement including goals and objectives and tackled the difficult task of Branch 'conflict of interest'. The recommended draft is currently with the Federal Councillors for comment, and discussion at the next Federal Council meeting.

We established a direct phone line during the year and upgraded our PO Box facility.

The Informaa Newsletter was again a great success attracting many good articles and providing volumes of local news and information.

We took part in our first Careers expo at the Alexander Library in July 1991. In association with ALIA, ASA, Curtin University and other organisations the RMAA had a strong presence on the Records Management booth. Janine Douglas and Neil Granland handled the many

enquiries. A very informative and professional records management display was provided for the occasion. Records management videos played continuously while Laurie Varendorff showed the advantage of the Canon 'Friday' system to a steady stream of parents and students.

During the year we established a solid and professional Membership, Standards and Status Committee chaired by Jim Bonzas. This committee is vital to our future professional standing.

Our national New Technology representative Nigel Chartres has vast and futuristic vision that will benefit both WA and the Australian Committee. Nigel looks forward to more national involvement.

Roley Sharpe has again fulfilled the very trying role of Treasurer in a very professional manner.

Education has been a major priority over the past year. The formation of our new Education Committee is indeed an achievement we have all worked towards. The committee will be chaired by Maggie Exon, Acting Head of the School of Information and Library Studies at Curtin with David Clark-Murphy tutor in records management subjects at Perth TAFE, and Janine Douglas, Manager: Records Management

Branch (State Archive of Western Australia) adding their expertise. Councillor Roley Sharpe and Martin Wray will complement the committee if not for age and good looks, but past and present educational background.

Experienced Councillors will fill most of our positions in the coming year and with many new enthusiastic members joining Council, our future looks bright.

Many thanks to all the Councillors who worked so hard for their profession and the Records Management Association of Australia in 90/91. Thanks also to the Federal Executive who worked tirelessly behind the scene in setting our direction and controlling our destiny.

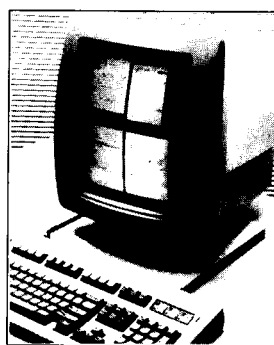
The new year will see our WA Branch with a larger more active Council. It may also be a year in which records management procedures and techniques come under the spotlight due to Royal Commission findings!

Our Councillors commitment emerges from their own records management beliefs. Members involvement and contributions will ensure their time is not spent in vain!

A. Howard
Secretary, Western Australian Branch

* * *

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LETTERS TO THE EDITOR

Dear Sir,

I read Janine Morrow's critique of *Organising the Office Memory* with considerable interest and thank her for her final remark "(the book)....deserves a place on all our bookshelves". While I found the review to be fair generally, I feel I must answer one or two of her critical comments.

Janine says of the book "it fails to cover any of the recent developments, primarily technological...." referring particularly to optical disc technology and barcodes.

I began writing the book in 1984. In 1986, when I finished the work there were very few PC's on desks, we lived in a world of main frames, and the only laser technology to be seen was the Toshiba 'Tosfile', of which none had been sold.

When I rewrote the work in 1988-89 to take account of emerging technologies, I realised that any text for our field would age rapidly. Therefore I decided to cover how a technology works, to give readers a knowledge, for example, of the barcodes themselves and how they are read. In-house production on laser printers was a technology not then even demonstrated. At that time also, I was unable to find any large organisation using barcoding for file tracing, although several of the Councils were investigating its potential.

As regards my not detailing the statutes that require the retention of records, this matter was avoided deliberately for the very reason that Mike Leigh MRMA, CRM has an excellent service called Australian Records Retention Manual, which provides regular updates. Why duplicate this specialised field? (For example, since my book was published the Tax Act has been amended to reduce the retention requirement to five years.)

On a more general level, I do not accept her criticism "that computerised records management systems which use text retrieval.....make keywords obsolete". There seems to be

confusion in the minds of many of my librarian-trained friends between the meaning of 'key word' (descriptor or word in context of a document) and my use of the term 'Keyword' (class names of an information area), a point I emphasised on page 61. Without classification prior to or during the capture process, retrieval will be made almost impossible except in the very short term. I can't imagine librarianship without Dewey or UDC and the same classification necessity applies equally or even more to records management.

Fred Diers said during his keynote address at the 1988 Congress in Perth that those in the profession in America are coming to realise that records management there must get back to basics and he specifically mentioned my work in Australia on controlling the creation process.

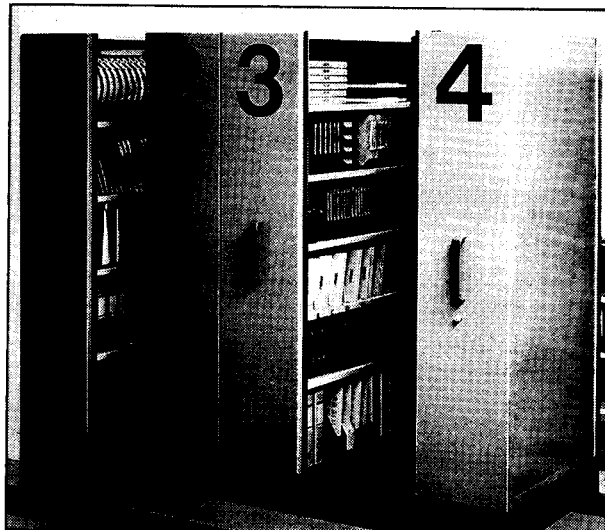
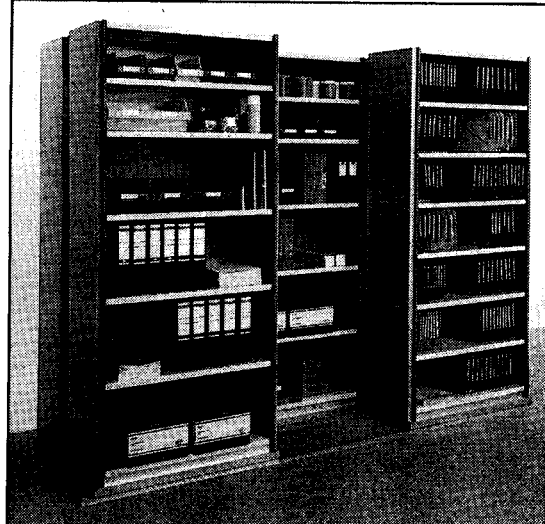
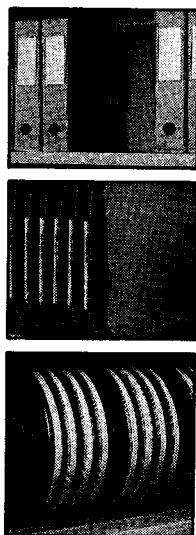
At this point of time my own records management program Keyword Information System (KIS) is being experimented with as a 'front end' to such a full text retrieval system with optical disc output.

This leaves us with a very serious question. Do we accept what the computer and optical disc suppliers tell us are excellent programs and/or systems, and their claims regarding the simplicity of retrieval, which in many cases fall far short of being even acceptable, or do we as a profession set the guidelines ourselves? I am yet to be convinced that we can easily find information (what we need for decision making) from a random accretion of data not previously coded by a formal classification pattern.

As Fred Diers said, we must get back to basics. This was the reason for my writing *Organising the Office Memory*.

J. Eddis Linton
B.Ec., FRMA, CRM, FAIM, FCES

[Members may wish to read another review of J. Eddis Linton's book which appeared in the ARMA Quarterly, April 1991, p.54. – EDITOR]



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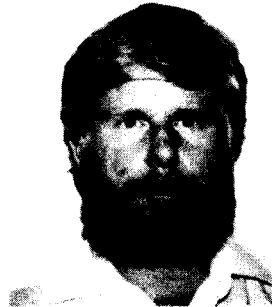
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MEMBER PROFILE

**PHILIP TAYLOR,
B. Bus, MRMA.
Records Manager,
University of
Queensland.**



Philip has worked in the records management field for 17 years, including periods at the Victorian Department of Health, Ministry for Planning and Environment, and the Office of Corrections, before his recent move to Queensland University. Philip has been actively involved in the RMAA at Federal and State level, and has held various positions of office, including Federal Vice President and Victorian President. He was awarded Member status in 1988. Informaa Quarterly interviewed Philip for this issue's Member Profile.

IQ When did your interest in records management start?

PT I don't know that you could say it really started as an interest, in common with a lot of others I really "fell" into the area. It started with an interview with the Victorian Public Service Board Recruitment Office in early 1970 which offered me, from memory, a job in stores, accounts or salaries and as an afterthought keeping records. Having an aversion to numbers I chose records and was directed to the Police Department. The Central Registry there was of the kind very common in the early 1970's, full of clerks, cards, cabinets and people tucked away deep in the building. Starting as the office messenger I managed to work my way up through the ranks as a file titler, indexer and classifier.

IQ What were some of the early influences on your records management career?

PT Obviously, the various supervisors that I have had over time. I seem to remember them as all being friendly and helpful. There were many characters. In those days it was an all male office in the days before EEO when women were barred from the administrative ranks of the public service. I enjoyed the work, found it interesting as you know what goes on around the place. It was around 1973 that I was first introduced to the RMAA when I heard about a TAFE course in records administration. People such as Alan Skerman, Bert Brewster and Peter Mulquinney played an important role in stimulating and maintaining my interest.

IQ What was it like studying records management?

PT I still have a very distinct recollection of the first night I went to class. There were four of us and Alan Skerman as the teacher promptly told us that records were the life blood of an organisation. I think that I was hooked from there on. I finished the course in 1976. The positive aspects to the course were that I began to understand why I was doing things at work. It made things much more interesting and I could start to see the potential for records management to improve the effectiveness of organisations. I enjoyed Prahran as I felt that it gave students a good perspective on what records management was all about.

IQ What were the particular aspects of records management that you remember from that period of time?

PT Looking back and reflecting on the situation at that time and contrasting it to now, I am struck about how much was achieved without computers. It is interesting to think that paper was, and still is, the prime medium of records management, but the systems used then of cards and folders were performed

manually. The amount of clerical effort required was considerable. There were many tasks done badly such as indexing but we seemed to muddle through. But I guess we did not know any better.

IQ What do you think are the main differences between records management of the mid 1970's and now in the early 1990's?

PT The biggest difference is undoubtedly computers, they have made an enormous difference. They have opened up new horizons and created an environment in which it is possible to manage records creatively. Another aspect is the sinking of the idea of the Paperless Office. It was all the talk around that time. Microfilm was cheaply and conveniently available and it was thought that the next revolution would be towards paperless offices. I have not seen any signs of this happening.

IQ You have been associated with the RMAA since the mid 1970's, what changes have you seen over that time in the Association?

PT There have been many important changes. The most significant that I can think of was probably the setting up of the last Branch in Tasmania. For the first time it was a true Australian Association. The holding of annual conventions I think has added a new dimension to RMAA activities. They provide a good opportunity to learn the latest changes. Informaa Quarterly has now grown into a mature journal of records management, the benefits of which will accrue into the future, and finally education. Ten years ago courses were confined to TAFE, and records management was firmly entrenched in the ancillary area of general administration. Now with the advent of degrees, associate and graduate diplomas and masters degrees and the entry into universities, a different world is emerging.

IQ You have been very committed to education for records management. What remains to be achieved in this area?

PT An enormous task remains. Only the tip of the education iceberg has been touched. We lack a single unified course at all levels. For example, there are gaps in what is available in NSW and Queensland. There is a large variation in syllabus and content and hours taught. Apart from Curtin University, there is no undergraduate degree. Interestingly, the development has been in the post graduate area. Some states have no training at all. My concern is that so far what has been gained has to some degree been hit and miss. It has required a lot of effort by Branches to get courses going but more needs to be done in the publicity area. I think that the area that excites me most is research. We have so many areas for potential projects it is hard to know where to start.

The issue of accreditation is another area which has to be resolved quickly. Unless we, as a professional body, can come to grips with accreditation and develop career paths for everyone, the talented will be tempted to leave and some will - this will be a great shame.

IQ You recently moved from Victoria to Queensland, what prompted this?

PT At a personal level I think I needed a change of outlook and environment - maybe it was a mid life crisis. I had been attracted to Queensland for its lifestyle and climate and the opportunity came along at the right time. But I knew it was time to move on when Collingwood won the AFL Grand Final!

IQ You had been associated with the RMAA at State and Federal Council for some time, how do you feel about leaving these positions?

PT It was with mixed feelings. I have had the opportunity to meet some fine people dedicated to the tasks at hand. I enjoyed the challenges, was delighted by the achievements, saddened by some activities which I felt took our attention away from

the main game. But on the whole there were many more plusses than minusses.

IQ Is there any aspect of records management that currently concerns you?

PT I think records management has to be careful that it doesn't get too carried away with the concept of information resource management. The last two conventions have tackled this aspect with mixed results. I think the reality is that we are on safer ground by advancing traditional records management principles and persuing them with excellence rather than going down the IRM path to an uncertain future.

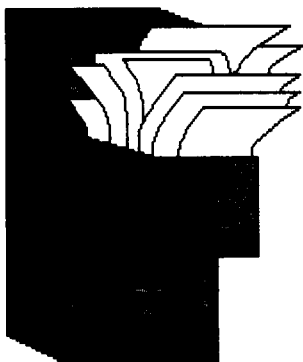
IQ What do you think will be the highlights

for records management by the end of this decade?

PT I am always wary of crystal ball gazing. I think the next few years will be about consolidation. I honestly cannot see any fundamental shifts in technology occurring. I think we will see a better educated workforce and more mobility. The courses will become more streamlined and focused upon the issues, and research will get off the ground. The other aspect has to be closer ties between archives and records management. I don't believe that we have anything to lose by opening up the dialogue both at a professional and work level. Both areas are too important to be seen as separate functions.

REPLACE

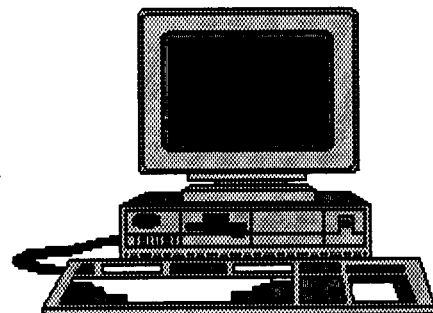
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FEDERAL EDUCATION REPORT

by D. G. Wheeler, Chairperson, Federal Education Committee

COURSES IN RECORDS MANAGEMENT

The following courses were omitted from the list of courses available throughout Australia and as published in the February edition of *The Informaa Quarterly*.

NSW Department of TAFE

Associate Diploma of Business - Records and Information Systems

Course aim:

Graduates will acquire the skill and knowledge to enter careers in commercial, industrial or government records and information management.

Frequency:

Courses commence in July.

Availability:

Currently the course is offered, subject to numbers, at Newcastle Technical College, North Sydney College of TAFE, Mount Druitt Technical College.

Attendance:

The course is offered for part time study over 4 years, 3 nights per week for three hours on each evening.

For further details please contact:

The Enrolling Officer
School of Computing and Information Systems

Department of TAFE Western Australia

Certificate in Records Management

Availability:

Central Metropolitan College
25 Aberdeen Street
Perth

Entry:

For further details please contact
Mr C Thorpe
Head
Department of Management

If any other courses have been inadvertently omitted or any new courses have been introduced, will be introduced, or will cease in 1992, please forward the information to:

Mr D G Wheeler
Chairperson
Federal Education Committee
RMAA
c/- 17 Balaka Street
Rosny Point
Tasmania 7018

This information will then be added to that already held and placed in the first edition of this Quarterly in 1992.

NEW TAFE COURSES IN RECORDS MANAGEMENT FOR TASMANIA

July 1991 heralded the introduction of a Records Management Certificate Course at the Hobart Technical College. In 1990 the Records Management Association initiated discussions with the Department of Employment Industrial Relations and Training with a view to establishing a formal qualification for people employed in the area of records management.

A curriculum working party consisting of members of the RMAA (Tas Branch), industry and union representatives together with TAFE personnel developed the syllabus for the course designed to be undertaken on a part time basis over two years.

The RMAA has made a financial contribution towards the cost of the course and the Tasmania Branch will be providing qualified staff for the teaching of the specialist units.

The subjects available in the semester commencing in July 1991 will be taken from those that are common to other commercial courses as well as the Records Management Course. One or two specialist records management units will be offered. At the time of publication the units definitely offered were:

Introduction to Keyboarding

An introductory subject which aims to teach the proper fingering techniques on a keyboard. Its function is to prepare students for further study, not for immediate employment.

Communications 1

To provide students with basic written office communication skills.

Work Ethics

Aimed to develop behavioural concepts and attitudes appropriate to the workplace and enable students to perform as effective team members.

Introduction to Records Management

To provide the student with a background for practical application and further study in Records Management.

A further specialist unit may be announced later in second semester.

As with most TAFE courses, students who feel that they already meet the requirements of a particular subject may, on application to the College, be granted an accreditation for the particular unit or units.

RMAA FEDERAL EDUCATION COMMITTEE REPORT

The above Committee met on 15 April in Melbourne. The major topic of discussion was the commitment of the Committee and the Association to education in records management. The Committee agreed that it should support the continuing development and strengthening of courses in records management throughout Australia. It was further agreed that priority will

be given at this stage to those in the TAFE environment until they are well established. A survey of members will be carried out, as part of a marketing survey to be conducted by the Canberra Branch, to determine if this is the approach the majority of members wish the Association to follow. Obviously the other approach would be to give first priority to the tertiary area.

With priority being given to the TAFE sector it was agreed that the following criteria should be distributed to Branches by the Federal Council to serve as a guide in designing and establishing courses for beginning level records managers:

The course will educate students to

1. Understand the functions, operations and purposes of records management
2. Understand the nature, sources and uses of information/records including legal ramifications
3. Thoroughly know and understand the phases of the records/information life-cycle
4. Know the different technologies used to control records and be able to list their advantages and disadvantages
5. Understand basic office and administrative practices
6. Know how to evaluate and implement basic changes to records management practices
7. Communicate effectively with clients and co-workers both orally and in writing
8. Understand management principles and practices

The meeting also discussed how important it is to reach agreement across the Association on what is meant by "records management". This issue was prompted as there is some doubt about the usefulness of the definitions in Article 1 (19) and Regulation 15 mainly due to the changing environment in records information management. The usefulness of these definitions is rendered most questionable during discussions with allied professions such as archivists and librarians. The Committee has

nominated one of its members to review the above.

At its meeting the Committee considered that the question of accreditation must be pursued with deliberation so that objectives, criteria and structure are in place in about 3-5 years time at which time adequate financial provision should have been made to begin the national review of established courses. The Committee is preparing a framework for the development of detailed accreditation criteria and procedures.

State representatives at the meeting also discussed developments in education within their Branches and also at the TAFE and tertiary levels in their States (where applicable).

The next meeting of the Committee will be held in Darwin during the National Conference. Members of the Association who wish any matters relating to education in records management to be discussed should get in touch with their State Branch or State Education Chairperson.

* * * * *

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INFORMATION INDUSTRY LEADERS PLEDGE CONCERTED ACTION FOR "CLEVER COUNTRY"

The National Executives of Australia's leading information professions held an historic meeting in Sydney recently as part of a five-day conference on "Documenting Modern Society", organised by the Australian Society of Archivists. The participating professional associations represent more than 10,000 information workers and 1,000 institutions and included the Australian Council of Archives (ACA), the Australian Council of Library and Information Services (ACLIS), the Australian Library and Information Association of Australia (ALIA), the Australian Society of Archivists (ASA), the Medical Records Association of Australia (MRAA), and the Records Management Association of Australia (RMAA). The attendees identified key issues and concerns of interest to both practitioners and organisations across the fields of archives administration, librarianship, medical record administration/health information management and records management, and formally committed their associations to co-operative action to address them.

John Levett, President of ALIA said that, "Collectively, we manage the information sources and services essential for effective human enterprise. Australia cannot hope to develop its potential as the "Clever Country" unless that job is done well. Selecting, preserving and providing access to vital information in a world awash with huge quantities and forms of recorded material which can be produced, altered or destroyed instantly is an enormous challenge".

Of particular concern to the participants was the need for recognised standards. Graham Dudley, President of the Records Management Association, observed, "We must jointly develop and require standards for suitable information recording methods and media. Recycled papers and magnetic tapes are not suitable media for retention of information of long term value. Technologies such as CD-ROM and optical disc are not yet fully

standardised and new research needs to be monitored carefully".

John Thompson, President of the ACA cautioned, "We must also focus upon improving access to significant and useful information through the use of standard descriptions and co-operative networks for distribution. We have the technology and skill to make books, documents, pictures, sound recordings, photographs and films available to users in any location through a single electronic source, but we must make common cause to do so effectively and economically".

Louise Robertson, Vice President of the MRAA, voiced the group's concern for professional visibility. "As technology draws us together, we also need to develop standards for education which identify the role and place of each specialisation in the "rainbow" of information knowledge and skills. Strong professional identity and mutual understanding is critical if we are to be respected and influential".

The meeting concluded with an historic resolution that each association would develop an effective mechanism within its governing structure at the national and branch levels to ensure joint consultation and co-operation. Christopher Coggin, ASA President and Convenor of the meeting expressed the spirit of the accord. "We are committed to travelling together in meeting the challenges of modern documentation, to consulting on where and how we wish to proceed. Utilising a mechanism for the regular sharing of views and interchange of ideas, we can channel our energies more effectively and truly represent the interests of the information industry to the wider community".

Graham Dudley
FEDERAL PRESIDENT



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"TOOLKIT" PUTS FRIDAY ON THE NETWORK

Canon has announced that computer interfacing promised for its CF-250 Friday desktop electronic filing system is now ready as a "toolkit" for systems developers.

The toolkit, which comprises CFIS, a set of image-handling routines and SCSI board, allows integrators to include Friday on computer networks as a high-speed scanner for all optical disk applications.

Tony Poynton, Canon's Information Management Division Marketing Manager, said that Friday, which was developed as an advanced personal filing system, would almost certainly become the standard high speed optical disk scanner on imaging networks.

He said Friday was the fastest and least expensive system available and already had the largest user base in the Australian optical storage market, which would appeal to application developers.

"As the scanner is able to provide standard G4 image output it may be utilised by any system as long as there is one DOS station connected.

At 80 A4 image sides a minute to disk, Friday is the fastest available scanner, yet is priced much lower than other high speed scanners"

Mr Poynton said user organisations now had the opportunity to expand their Friday imaging systems.

To utilise the toolkit, the Friday disk containing the relevant information is inserted into the PC workstation's own optical disk drive. CFIS makes the images available to DOS in either bit map, change code or Group 4 format, so vendors' application software can take the image file into their own application.

According to Mr Poynton typical users are likely to include government, transport companies and legal firms - any organisation that has to record vast amounts of documentation that may require quick retrieval.

Friday as a scanner is priced at \$20,000, the 512Mb magneto optical drive at \$5000, and the CFIS board and software at \$2,500. Mr Poynton said this compared with \$100,000 for slower systems that attempted to do the same job.

* * * * *

BOOKS

Keeping Data

Papers from a Workshop on Appraising Computer-Based Records

Edited by Barbara Reed and David Roberts.

Published jointly by the Australian Council of Archives and the Australian Society of Archivists Incorporated, 1991, 122pp.

Cost \$14.50 for members
 \$18.50 for non members

Available from ASA Inc.
 PO Box 31
 O'CONNOR ACT 2601

A review of this publication will appear in a future issue of *Informaa Quarterly*.

THE ARCHIVAL DOCUMENT - A Commentary

by Philip Taylor, B. Bus, MRMA

The article by Frank Upward, *Informaa Quarterly*, May 1991 opens up for debate an important new perspective on archives and records management. This is particularly true in the Australian context with our mixture of English, European and North American record-keeping practices. The concept of an archival document is interesting because it adds a new dimension on why records need to be managed what ever their purpose. As the author correctly points out, the emphasis on records management-management information has been found in reality to be depressingly weak.

The term 'archival document' is particularly useful as it is one that crosses the boundaries that have developed between archives and records management. Traditionally archives have collected records thought worthy of either long term or permanent preservation, whilst records management has been concerned with the record from time of creation until it reaches an age where consideration is given to an alternative location. Keeping records according to age has been shown to be an imperfect method.

The archival document goes beyond thinking about records keeping as a day-to-day activity by urging the observer to view records keeping in the broader context, specifically its relationship to society. This approach Upward argues, opens up new perspectives and enables us to challenge many of the past assumptions made about records management.

The real test of records management-management information is how many organisations could raise their corporate hand and say "yes, we have achieved management information". I suspect none. So are we chasing a wild dream? The examples used by Upward reveal that to think that all records are somehow going to be magically organised in such a way that they are all available immediately, are perfectly indexed and not

stored in some basement cupboard is foolish. Quite simply if management information is such a wonderful idea why haven't organisations grabbed the idea and implemented it?

I suspect the answer to this question comes in two parts. Firstly, it is very difficult to define the concept of management information and secondly it probably has been under our noses all the time, we just didn't recognise it.

Of all the articles on management information, and there are many, the explanations and definitions are wide and varied and very much depend upon the perspective of the author. For example, a computer systems analyst will view it as designing better and smarter computer systems. A librarian will suggest that it is the better accessibility of published information. The archivist will suggest that it is better collection, appraisal, arrangement and interpretation of records; while the records manager will suggest that it is the better management of current records.

All the above are probably true, such is the nature of management information. It can take any shape, form or complexity - a real chameleon. The reality is that we have not reached anywhere near the pinnacle of better managing the information under our control.

It has to be conceded that there have been many positive records management programmes implemented. But it is difficult to suggest that this was because information management principles were applied. It is much more likely to have been the application of good old fashion basic records management principles. So maybe the answer has been under our noses all the time. Give management information away and return to the basics.

It is within this context that the archival document is best seen, for it suggests that the

key to better records keeping is to understand the transactions they reflect.

The other element of the archival document is the accountability factor, a term we are hearing more about than ever before. Accountability appears to have become the buzz word for the 1990's. Upward's proposal is certainly valuable in this area. One of the key ways to determine accountability is to examine the records of the transactions which cause the questions to be raised. The problem becomes one of interpretation and analyses, an area outside of records management. Clearly, it cannot be denied that accountability has had an important influence upon record-keeping particularly in the public sector. The various administrative watchdog bodies such as the Ombudsman, Parliamentary Committees, Boards of Inquiry, Judicial review and to some extent Freedom of

Information have provided compelling reasons for compliance with good records keeping procedures. But as Upward remarks this does not ensure that the records created are not destroyed. If people wish to tamper with history they will. However what remains is critical to the operation of the principle of accountability.

Maybe we have all been sold a myth. Management information is nothing more than improving the existing principles of records management and archives. This would not be the first time records management has been led up the path - remember the paperless office?

The development of a concept of the archival document to explain further the purposes of records keeping is to be applauded. It is a major development to understanding more about the things we do. The principles are important and worthy of more thought and research.

* * * * *

FEDERAL COUNCIL 1990/91

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DOCUMENT IMAGING AND ELECTRONIC DOCUMENT INTERCHANGE - AN OVERVIEW

by Gerry Mackenzie, B. Ed, Dip Lib

Gerry's background is in information systems and services with major private sector companies. This has included records management, establishment of information services within businesses, and research and analysis. Gerry is currently undertaking a Master of Business in Information Technology. The two papers on Document Imaging and EDI are overviews of each of these technologies, completed during Gerry's studies, and are reproduced here with permission of the author.

* * *

DOCUMENT IMAGING

Overview

The technology of document imaging today requires a computer system especially designed to digitally store images, and to retrieve and display or print the images when required. Images are forms, files, documents, reports, diagrams, charts, film or any other source of information. A number of systems will also store computer generated data from any digitising source: text, speech, audio information, CD-ROM data or magnetic tape.

An Optical Disk System replaces paper, microfilm or microfiche files. Optical disks provide random, but simultaneous access to large quantities of data.

This paper covers the use of Optical Disk Systems for document imaging. Although most systems will process two dimensional representations of objects - essentially a digital photograph - this paper does not touch on either sound or image processing.

Description

Document Imaging Systems have the following components

1. Image Management Database Computer
2. Workstations
3. Scanners
4. Jukeboxes
5. Optical Disks
6. Networks/Communications
7. Printers
8. Software

Image Management Database Computer

The size and capacity of the hardware will vary with the requirements of the company - the volume of documents to be stored, number of workstations, jukeboxes, printers, future integration requirements, etc. The system is responsible for the management and storage of images on optical and magnetic disk.

The Image Management Computer would have one or more 5¹/₄" or 12" non-erasable WORM (Write Once Read Many) optical disk drives connected to it. The drives may be housed in one or more "jukeboxes" - a robotic system which moves optical disks between slots and drives. Jukeboxes can range in size from 16-288 optical disk storage capacities with one to five drives each.

Workstations

The primary user interface into the document imaging system is the display workstation. High volume image processing and retrieval is accomplished at single, integrated or cluster workstations, to enter and view documents, initiate scanning, printing and facsimile transfer.

Scanners

Documents may be scanned with OCR indexing at 200, 300 or 400 dpi (dots per inch), compressed using CCITT Group and facsimile format and stored on optical disk. The compression of data is made possible using an application accelerator with a frame buffer

interface to enhance data processing performance.

Scanners come in different sizes, colour resolution capabilities, speed and for different types of media - microfilm, fiche, various sized paper, photographs.

Jukeboxes

These are high performance disk handling systems for 5¹/₄" or 12" WORM disks. The jukebox supports from 1-5 drives and from 16-288 optical disks. The robotic arm in the jukebox uses optical sensors and targets to position the required disks. Multiple disk drives provide simultaneous access to multiple records. Jukebox software is designed to optimise simultaneous movement of disks and to minimise the time to service each user in a queue of retrieval requests. There are about 20 different jukeboxes on the market.

Optical Disks

There are three types of optical disks

- CD-ROM
- WORM
- Rewritable

Most Document Imaging Systems use WORM disks. Since it is a write once, non-erasable medium, information remains intact permanently. WORM disks come in four sizes: 5¹/₄", 8", 12" and 14" with 5¹/₄" or 12" predominant. Most systems will support either 5¹/₄" or 12" disks or both. The 12" disk has a capacity of 2 GBytes or 80,000 A4 pages scanned at 200 dpi. The 5¹/₄" disk has the capacity of 654 MBytes or 26,000 A4 pages at 200 dpi.

Rewritable disks may be the next disk product which will be a high capacity reusable storage medium. "A 3¹/₂" rewritable optical disk may look like the one used in the PS/2 or Macintosh, but will store 200 times the amount of information." (OFFICE, March 1989).

Networks/Communications

Networks

There are three main types of networks used by current systems

- Ethernet (10 Mb): 4-10 images per second
- Token Ring (4 Mb): 2-5 images per second
- Token Ring (16 Mb): 7-5 images per second

Communications

Communication lines assist the transmission and receipt of document images, computer data, WP text to and from workstations, document entry stations and print stations in remote locations. Communications systems should also be able to connect departmental Local Area Networks (LAN's) so that users on each system can access information on other linked systems. System-to-system communications also support remote job entry and processing.

Facsimile

Facsimile transmission allows users to send and receive documents to and from standard facsimile equipment via dial-up phone lines. Facsimile services may be connected to the LAN depending on volumes.

Printers

Printers have many of the same characteristics as scanners. Resolutions for both interact. If documents are scanned at 200 dpi, either a 200 or 400 dpi printer should be used. Printing at 300 dpi results in a "fuzzy" image. Print speed is significant. It should not interfere with scanning and retrieval. Printers are usually connected to workstations, which allows them to be distributed throughout the organisation.

Software

Database management software - which controls the operation of document storage, retrieval, printing and processing, disk storage management and various system administration functions - could be purchased in interfaced modules or a distributed system of co-operative network processors (for large applications).

Depending on the size of the applications the software features could include

- Document imaging
- Workstation windowing
- Document display
- Print spooling
- System administration
- Security

Vendors

The companies who sell WORM based image management systems fall into the following categories

- Established companies selling "branded" systems
- Systems integrator companies in the software business who select hardware and configure software designed to meet market needs
- Value-added resellers - companies offering systems from the first two categories, but adding a degree of customisation

I have examined the products of the following vendors

- FILENET devised by Filenet Corporation in the US but marketed by Olivetti Australia. A system suited to medium - large applications, with a minimum start-up cost of \$200,000. Known sites include the Australian Patents Office (Canberra) and Victorian Land Titles Office. They are reputed to have four more sites in Australia.
- MARS (Multi-User Archival & Retrieval Technology) marketed by Delairco and dedicated to run on Macintosh computers. A system suited to small - medium applications. One known Australian site is at the Australian Submarine Corporation.
- DART (Document Archival Retrieval Technology) marketed by Ipex Computers is a PC based system, with open architecture design.
- Wang's WIIS (Wang Integrated Image Systems) is dedicated to proprietary hardware and marketed by Wang Australia. The software is run on Wang VS Systems and suitable for medium - large applications. A known Australian site is the SGIC.
- Tower Technology Software is open and configurable to customised requirements. A minimal system starts at \$200,000 and includes: Imageserver, Printstation, Single Workstation, Optical Disk Drive. Sites in

Australia include: Geelong & District Water Board, Sydney Water Board, State Bank of NSW, Brambles.

Application

The Optical Disk Systems currently available cover a wide range of capacities, performance, features and prices. There are three major types.

1. Standalone System intended to be used by one person at a time, and consists of PC software attached to an Optical Disk Drive. Such a system is limited in terms of performance and expansion.
2. A "Star" System, which consists of a central computer, with terminal connection to each workstation.
3. A Network System, where local area networks are used to connect systems and users.

Star or Networked Systems can be expanded into large systems with several networks, many jukeboxes and drives, several printers, high speed scanners and numerous workstations.

The key to the successful application of document imaging technology is

- scanning and indexing
- image storing
- display
- retrieval and printing
- security
- backup
- flexibility and user friendliness

It should be possible to **scan** most documents at low resolution, but scan specific documents at high resolution. Scanning at high resolution means finer lines and smaller text are clearer. Colour support and contrast, paper sizes to be scanned and a capability to scan various type of media, eg. microfilm are also factors to be considered. Scanning rate may be slowed by documents of different shape, size, and density.

For high volume scanning, the limiting factor may be the rate at which documents can be indexed. There are three automated **indexing**

methods: barcodes, OCR and mainframe access. Systems should also offer facilities for manual indexing, if required.

Displays come in a range of sizes, resolutions and orientations. Care should be exercised when evaluating displays. The larger the screen, the easier to read. However, it may take up more disk space. It may be useful to evaluate the brightness, stability and refresh rate of displays.

The **retrieval** process involves selecting a title and displaying the document. Some systems accept truncated title searches, while others accept freetext. Documents may be distributed to any user using communication links and/or LAN's. The Tower Technology retrieval system, to optimise retrieval, decompresses subsequent pages of the same document, whilst the user is examining the first page. Zoom facilities are useful for certain applications, eg. verifying signatures in a bank or legal office.

All optical disk storage for document imaging is compressed, ie. converting text into shorter coded sequences, to maximise storage volume.

Most systems offer **security** features, ie. limiting access to the system, limitations on display, print, delete, indexing, modification of titles and editing functions.

Backup facilities should be an important requisite for system maintenance, control, potential disaster recovery.

System **flexibility**, to grow according to changing demands within the organisation and **user friendly** devices are a must if the system is to be adopted by staff who have to input, index and retrieve data.

Final Comments

Document Imaging Systems are still the preserve of large applications. Minimum applications start at \$200,000 and hence the cost needs to be analysed, justified and the system installed carefully. Records management and document processing needs differ from one application to another, eg. an insurance company claim

processing is quite different from the way a pharmaceutical company puts a drug application together. Customised processing applications are imperative as is knowledge of industry operations.

In Australia, the use of "electronic documentation" as legal evidence has not been resolved. NSW and Tasmania are in the process of revising their Evidence Acts to accommodate the legal legitimacy of electronic storage media. Other states will need to follow suit. Consequently, at present, paper copies of corporate, accounting and legal documentation have still to be retained under the present statewide Evidence Acts. Whilst economies of scale may be achieved with on-site storage by electronic means, the cost of off-site storage must still be borne until the legal niceties are resolved.

Document imaging offers strategic advantages for MIS users, in that all current documentation can be captured at source and may be accessed for decision making at a faster rate than is possible now with paper files scattered throughout the organisation or between individuals.

* * *

ELECTRONIC DOCUMENT INTERCHANGE (EDI)

Overview

What is EDI? Electronic Data Interchange (EDI) is a technology that reduces the need for conventional paper documents. Orders, invoices, logistical information and scores of other transaction forms are replaced with computer messages in standard formats across a telecommunications network, which acts as a mailbox between "trading partners". EDI is much more than just an electronic mailbox. Whereas E-Mail requires a human reader to interpret the data on the screen, EDI does not. Computers do the reading.

Using EDI, a distributor can send a purchase order from its computer directly to the

manufacturer's computer. The buyer's purchase order, the seller's confirmation, shipping documents, invoices, payment, administrative messages are transmitted accurately and instantly.

Among the steps required to implement EDI are

- Agreeing with one or more trading partners to undertake EDI
- Selecting, installing and configuring EDI translation software
- Selecting and signing up with a Value Added Network (VAN)
- Installing and configuring communications software and hardware
- Establishing a Pilot Program with one or more trading partners. Testing communications with partners.
- Retraining staff to use EDI
- Writing a mapping program for interfacing an EDI translator with a host system
- Expanding one's trading partners as well as the variety of documents exchanged

Description

Hardware

Most branded PC's (IBM PCXT equivalent and higher), mini and/or mainframes can be used, including network products. PC's are used in conjunction with other hardware platforms, eg. VAX, IBM S/36, S/38, HP3000 series, etc.

Software

The most prevalent software use is OS/2, DOS and operating system software for minis and/or mainframes. However, communications software for the conversion of application related data into EDI data is required. This "translation" process works as follows.

File conversion software converts data from an application programme (eg. a purchasing system) into a fixed length set of records contained in a "flat file". This is sometimes referred to as mapping. The "flat file" is read

into the translator where it is converted into the desired EDI format. The converted data is then sent down the line under the control of the communications software, which handles network management. The communication software links into the conversion software on the receiving partner's end. The data is reformatted into a structure acceptable by the recipient's application.

Communications

Several communication network alternatives for EDI exist.

A company may implement a private EDI network.

Third parties such as Value Added Networks or a Remote Computer Service bureau can provide a mailbox store and forward service and can also provide conversion services for different formats or communication profiles.

Industry association networks service particular industries, eg.

- EXIT (Australian Customs export clearance and reporting system)
- Tradegate (linking of Australia's international trading partners on an electronic communications network)
- Supplynet (combines a database service with electronic trading facilities to improve the government purchasing process)

These three approaches are not mutually exclusive. Linkages between the three domains can be built.

Value Added Networks use basic phone lines from the communications carriers and add packet switching, error detection, retransmission and protocol conversion. These networks provide a "ready-to-use" capability allowing communication between distant locations without the cost of direct communication links.

Standards

In an EDI transaction, there are specific data formats that are used to represent business documents electronically. Few companies share the same record layout. Hence incompatible

record layout is translated so that computers can accept exchange data. By recognising the start and end of data elements, the computer uses EDI operating "syntax". With standardised syntax, implementing EDI with numerous trading partners becomes significantly quicker and less cumbersome. American National Standards Institute's (ANSI) X12 standards have been adopted by several industry groups internationally to aid EDI expansion and implementation. So far ANSI has developed about 50 different messaging standards¹. For Australia, the use of ANSI standards are coupled with the UN & EC supported EDIFACT (EDI For Administration Commerce and Transport) standards. Increasingly, interconnecting software is being developed to connect multiple host environments which use different messaging standards.

Recently, OSIcom, a consortium of competing manufacturers promoting Open System Interconnect technology demonstrated a new standard called Open Document Architecture (ODA), for formatting documents to be exchanged between incompatible computers.² It is claimed that both ODA and EDIFACT will become the standards for Australia.

Security

In determining the levels of security needed in an EDI system, the first management step is to undertake a risk assessment of the threats imposed by the new system. Security responsibility can only be taken for the part of the network over which management have direct control - the company's own information system and data network. There are four main concerns which may be expressed as follows

- System Availability
- Data Integrity
- Business Continuity
- Data Confidentiality

EDI systems must be made reliable and secure in order for them to be used confidently by management. **Authenticity** of transactions and trading partner computer applications form a basic concern along with the **integrity** of the transaction itself. **Confidentiality** of trading

is also a concern, particularly where trans-border data flow are involved and/or banking/financial transactions are generated or processed. The "Smart Card" presents a solution to these problems and it would appear that it is ready to be integrated into EDI applications at the formatting stage as well as playing a part in EDI partner agreements".³

Benefits of EDI

Essentially, EDI is the result of efforts to tackle the excesses of paper communication. Telephone/Fax/Telex ordering is laborious and error prone, reliance on mail slows turnaround time, and paper or verbal information is not directly useable by computers.

The benefits of EDI are that companies can shorten their order cycles, carry less stock, release working capital, cut paper work and save on administration and purchasing. Fewer copying errors are made, rekeying information at different points - manufacturing, supplier, retail, etc. - is not warranted. Employees displaced by EDI may be retrained to deal with customers.⁴

EDI allows plants to link with their materials suppliers, and retailers to link with manufacturers. Ideally, all levels of a production process may link though EDI. In summary, EDI provides information productivity. There is also an increasing appreciation that **information management** can be used both economically and profitably.

EDI is still in its infancy in Australia. It has taken a foothold in industries where the flow of paper is voluminous: retailing, automotive, pharmaceutical, transport and freight.

Legal Implications

Some of the common legal concerns expressed which are still to be resolved are

- Authentication of EDI information
- Communication of trade terms and conditions
- The satisfaction of legal requirements that information be "written" and "signed"
- How the error risk should be shared by partners

- The permanent storage of information, and how government requirements for records retention will be met

Vendors, Product Names and Users

There are 26 vendors - which include software and hardware companies, consultants and other suppliers. Some of the major vendors - domestic and overseas - have established joint venture EDI partnerships to maximise the research and development, interconnectivity between systems, and management of information environments.

Some of the major vendors in Australia are

- **Telecom Plus** in conjunction with Ferntree Computer Corporation have developed **Trade link** EDI software for use by the electronic, automotive, heavy metals, pharmaceutical and rail industries
- An affiliate company, **T-Net** in partnership with P & O Container Shipping has an EDI program underway for the export wool industry. Telecom Plus is also involved with the expansion of **Supplynet**, a government procurement system used in WA, SA and spreading.
- **NEIS** owned by the State Bank of NSW has been active in the EDI field for the past four years. It does not have a branded product, but has attracted some "blue chip" customers to its electronic trading systems: BHP, State Rail Authority (NSW), Dunlop Pacific, J Blackwood & Sons, NSW Electricity Commission.
- **Paxus Comnet** (formerly Csironet) has developed an extensive electronic communications service for Australia's international trade community, in partnership with Tradegate Pty. Ltd. - a confluence of public and private sectors. **Tradegate** is used by Australian Customs, Port & Marine Authorities, Qantas, shipping companies/agents, Austrade, freight forwarders, importers/exporters, road transport companies.
- **OTC** with its joint venture partners is responsible for Australia's largest EDI service, linking exporters, freight forwarders, customs agents, Australian Customs Service (ACS) and the Australian Bureau of Statistics.
- **GE Information Services (GEIS)** has applications for PC's as well as mainframes. Its EDI applications interconnect with several other providers, including Telecom Plus, Singapore Trade Net, and INS (UK).
- **UNISYS's** product called EaDi (Easy Access Document Interchange) recently introduced Unix based software which provides a gateway to multiple host applications.
- **Infonet** is reputed to have 37.4% of the global EDI market.⁵ It has formed an alliance with a number of US firms, Telecom Australia, SE Asian telecommunication carriers, and European firms. The aim is to provide a consultancy service, develop a global implementation plan and create links with foreign trading partners.

Price

EDI at the low end of installation can be incorporated for as little as \$4,500 (excluding personal computer). Costs escalate for larger systems and can vary depending on the type, application and links with trading partners.

The hidden costs can be associated with large companies because they have to make bigger internal changes: personnel, administration, workflows, etc.

Conclusion

EDI requires trading partnerships, hence companies must adopt it together. It promises an increase in information and personnel productivity, reliability, timeless, efficiency and integrity of data. The advance in gateway and communications interface technology mean that computers do not have to be of the same model or type to interpret exchange data. The stumbling block however, is the lack of

universally accepted standards for formatting documents. This is because EDI was originally developed as an industry specific or even company specific technology.

Footnotes

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ELECTRONIC RECORDS: ISSUES FACING THE AUSTRALIAN ARCHIVES

by Dagmar Parer, Steve Stuckey, Andrew Wilson

The authors of this paper are from Australian Archives Central Office. Dagmar Parer is Director, Development and Planning. Steve Stuckey is Director, Records Evaluation and Disposal Section. Andrew Wilson is an Archives Officer.

Professional journals in the field of information management regularly publish articles examining issues associated with the storage, control, retrieval and dissemination of electronic records. This reflects society's increasing use of technology, and information professionals' growing involvement and concern with the management of electronic records.

The Australian Archives shares this interest, especially as the *Archives Act 1983* has given the Australian Archives the authority to ensure that all existing and future Commonwealth records of administrative, community, legal and research value are properly accessible so that through these records the needs of government are met in relation to safeguarding national interests, interfacing with the public, and in operating the machinery of government. The Act also ensures that the needs of the public are met to safeguard their interests in relation to government activity, satisfying occupational needs or personal pursuits and in understanding the Australian nation.

The Act also authorises the Archives to manage the Government's records in electronic format. Section 24(5) of the Archives Act extends the definition of Commonwealth records to explicitly include data processed by machine:

"for the purposes of the application of subsection (1) to a record of a kind used by means of any mechanical or electronic device or equipment, including a computer, any treatment or modification of the record that would prevent the obtaining from the record of information or matter that could previously have been obtained from the

record shall be deemed to be destruction of the record"

This Section brings electronic records firmly under the disposal provisions of the Act by deeming to be destruction any modification which leads to loss of information. Destruction, of course, is prohibited by Section 24(1) except where Section 24(2) provides sanction.

The use of technology by Government Departments and hence the information held in electronic format is on the increase. The Australian Archives obtained an indication of growth of electronic records in Government when it conducted the National Records Return (NRR) survey in 1985-87 involving a systematic survey of all records held by Commonwealth agencies (including those overseas). The 780,300 data items collected covered such matters as physical record formats, quantity, growth rates, disposal coverage, and physical condition of records as well as the characteristics of ADP equipment and records storage facilities used by agencies. The information collected in this survey formed the basis of a statistical database capable of analysis and interpretation for planning purposes.

The survey showed that the use of ADP equipment was widespread, and agencies expected to increase this by 50% in the two to five years following the survey. Paper held information comprised almost 90% of total Government held information, in 1987, as measured in linear shelf metres. In contrast information held in electronic format occupied 2.8% of linear shelf metres.¹ Unfortunately, while the percentage of linear shelf space occupied by electronic records was small in 1987, that percentage gives no indication of the value or the amount of information held in electronic format.

It needs to be noted that a major characteristic of digitally stored information is that one can

capture large amounts of data quite out of keeping with its physical space requirements. For example in a test exercise carried out by the Public Record Office (UK) and the Central Computer and Telecommunications Agency (CCTA) one optical disk was found to store the same amount of information as 63 magnetic tapes (two gigabytes of data)². One optical disk occupies about two centimetres of shelf space, while 63 magnetic tapes require approximately five shelf metres. It is not known how many equivalent shelf metres of paper file that would occupy.

According to the NRR figures Government departments' estimated average rate of increase for all records in 1987 was 13% per annum, Electronic record growth however was estimated to be higher, with a growth rate of 17.9% per annum.¹

Since 1987 the range of information technologies available and rate of utilisation has increased. Departments have available for their use a host of information technology choices ranging from word processors, packet switching, database management systems, microcomputers, local area networks, online databases, Email, fax, CD-ROM, optical disks, voice mail, electronic data interchange, erasable optical disks, optical cards, authoring systems, speech synthesis, molecular electronics, neural networks, optical computing or expert systems. The amount of information represented in electronic records is therefore likely to be higher than the rate as estimated in 1987.

In light of the Archives' legislative responsibility to manage the records of the Commonwealth and the fact that utilisation of information technologies in Government is on the increase, the Archives has identified a number of issues which it must resolve.

Namely, Archives must know

- What technologies are used by Government Departments and what volume of electronic data is being created
- What guidelines relating to the control and management of electronic records Archives will need to issue to its clients

- To what degree Archives will have input into determining industry standards associated with the transfer of information
- What data storage and transfer standards can be set and adopted
- What policies Archives needs to set to ensure the storage of its clients' present and future records, in whatever format, and to ensure long term access to those holdings

In order to address these issues the Archives needs to continue to obtain information regarding

- The form of technology used and the rate of accrual of electronic records in relation to accrual rates of paper records
- The volume of data/records generated by the use of automated information technologies
- The percentage of electronic records that will have long term or permanent value as determined by Australian Archives appraisal techniques

The availability of this data will allow Archives to make well based assumptions about the record holding trends that Archives will have to cope with in the immediate, medium and long term.

As well as determining the volume of permanent value electronic records being generated, the Archives needs to provide its clients guidelines in the following areas which will assist them to

- Identify data/records held in electronic format of permanent or long term value to the Government
- Incorporate archival management features into client information management systems
- Determine the appropriate format to store and transfer electronic records onto a standard storage medium prior to deposit with the Archives and what the standard(s) should be

Archival institutions can accept electronic records in any number of formats, including the format the data was stored on in the agencies

computer, usually magnetic disc. Nevertheless archival institutions will need to consider whether there should be a standard storage medium for data deposit in order to facilitate access to this information.

The Australian Archives Corporate Plan for 1990/91 specifically targets, as a principal action, the development of standards for, and approaches to the management of electronic records. Work is gaining momentum in this area. Australian Archives has developed procedures for the management and long term retention of electronic records held on PC's. These procedures were outlined in the booklet *When It's Gone, It's Gone*. Australian Archives has also prepared separate appraisal procedures for information held in electronic format.

The appraisal procedure has the following components

- An introduction, advice on establishing a project team, conducting a system overview, the appraisal process and the steps involved to complete the appraisal process and the steps involved to complete the appraisal according to Archives requirements
- The appraisal criterion as applied to all records, irrespective of format with comments as to the specific requirements of electronic records
- Advice on formats for retention of data and background details on electronic record systems
- An appraisal flowchart specifically including the factors to be considered with electronic records
- Checklists and forms for a systems overview
- A bibliography for further reading
- A set of questions to ask as part of the systems overview³

Australian Archives has also dedicated resources to determining what policies, procedures and practices Archives and Government agencies

need to set in place to ensure the effective and efficient management of the growing volume of Government generated electronic records.

As part of its approach to managing electronic records Australian Archives has been following developments in this area in overseas institutions, as well as in the other archival institutions within Australia. Our overseas attention has primarily been focussed on work done by the national archival institutions of English-speaking countries: the National Archives and Records Administration of the US, the National Archives of Canada, and Great Britain's Public Record Office. Each institution has approached the issues somewhat differently and the short summary that follows will point out the salient features of each.

The approach taken by the US National Archives and Records Administration (NARA) is to have traditional archival activities, such as surveying, evaluation, and sentencing, to be carried out by the Office of Records Administration, the branch which deals with these activities irrespective of the format of the records. Once electronic records have been transferred to the custody of NARA (and NARA will only accept 1/2 inch magnetic tapes in EBCDIC or ASC11 with specific formatting requirements) responsibility for their preservation and accessibility lies with the Centre for Electronic Records, an independent arm of NARA. The Centre is also responsible for NARA's participation in such issues as standards for data exchange, and involvement in system design and procurement processes.

The National Archives of Canada (NAC) has approached standards and systems design issues in a similar way. The Information Management Standards and Practices Division of the Government Records Branch was established to participate in standards issues and to provide advice about information management issues to Canadian government agencies. Disposal procedures for electronic records are carried out by the Disposal and Evaluation Division of the Government Records Branch. Unlike NARA the NAC has not adopted a media specific structure to manage electronic records that are taken into archival custody. Electronic records

of long-term value become the responsibility of the Government Archives Division of the Historic Resources Branch and are treated as any other archive material.

The Public Record Office of London (PRO) has taken a slightly different approach. Traditional archival functions, such as appraisal, selection and evaluation, for electronic records created by British government agencies are the responsibility of Departmental Records Officers who operate within government departments. The PRO decided, in 1989 to establish a 'computer-readable data archive'. This facility, part of the Information Technology Unit, stores all electronic records considered to have long-term value on optical disk. Transferring data to optical disk will be undertaken by the PRO, as will preservation and accessibility of the records thus stored. The IT Unit is also responsible for examining issues like standards for data exchange, and for managing the PRO's internal automated information systems.

The situation in Australia is a somewhat less active one. Few state archival institutions are sufficiently well resourced to be able to deal with electronic records issues except on an ad hoc basis. While all recognise the need for a co-ordinated management approach none but the Archives Office of New South Wales (AONSW) has been able to take such a step. The AONSW has created a full-time staff position to manage 'Machine Readable Records' and has been active in setting up an interdepartmental government task force, which the Principal Archivist chairs, to deal with issues in the management of electronic records. The AONSW has also developed an appraisal procedure specific to electronic records.

The Public Record Office of Victoria has developed specific procedures for managing the appraisal of electronic records which place the responsibility for ensuring the accessibility and retention of electronic records of short-term value squarely with the Victorian government agency creating the records. They are attempting to develop a co-ordinated management approach to dealing with electronic records but at present do not have sufficient resources to give this a high priority.

The international archives community is aware of the issues that need to be faced in relation to the management of electronically held information. Archivists and record managers know they are dealing with information that is held as data in a technologically dependant environment, that the information is broken up into data elements that can be easily amended, deleted or manipulated and that the information is physically held in a variety of formats ranging from magnetic tape to optical tape. These factors complicate the record manager's and archivist's attempts in answering the question of how to ensure long term storage and more importantly access to the information held in electronic format.

Australian Archives acknowledges the importance of this issue, it had dedicated resources to address the issues of electronic record management and thereby hopes to contribute to the international efforts in this area.

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RMAA FEE SCHEDULE 1991-1996

A new schedule of fees for RMAA membership was outlined in the February 1991 Informaa Quarterly, Vol 7, No 1, p 10.

The table of fees did not show Joining Fees for 1991/1992 and beyond. The Joining Fee for all categories of membership will be standardised to \$15 per category commencing in 1991/1992.

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ELECTRONIC DATA INTERCHANGE (EDI)

by Nigel Chartres, B Sc (Hons), MB (Bus Sys), ARMA, MACS

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Introduction

The subject area of Electronic Data Interchange (EDI) needs to be addressed with brief reference to Electronic Trading (ET). Both terms are often difficult to define precisely, owing to the array of interpretations often applied to them.

In the simplest terms although EDI is a subset of ET they both enable "commonplace" business information, which has traditionally been transacted on paper, to be processed in an electronic environment.

This paper outlines the ET and EDI concepts and environments, including their history and some current issues. Then it focuses specifically on how EDI systems and related business issues might impact records managers and their roles, especially as participants in information technology projects which implement these environments.

EDI and ET Environments

Today there are many examples of electronic trading from basic systems, such as direct credits to bank accounts, to quite sophisticated systems installed in the nation's stock exchanges. According to a recent article in the Australian Financial Review¹ there are currently 1,500 systems in Australia with an EDI component. In the same article it was predicted that by the year 2010 there would be very few surviving organisations which would not be

using EDI. Lamb² predicts that in Europe by 1992 80% of retailers will be conducting business via EDI links. According to Fist³ Electronic Trading encompasses four closely parallel and related technologies.

1. EDI which deals with the transfer of formatted business documents or structured messages, such as invoices and purchase orders
2. Electronic mail (E-Mail) which includes new innovations such as personal computer to personal computer facsimiles travelling across the common telephone network
3. Electronic funds transfer which includes customers direct debiting their bank accounts from point of sale terminals in supermarkets
4. Systems using sophisticated on-line database catalogue systems for preparing common business documents such as purchase orders. For example, the ability to search an up-to-date item and price inventory database and simply order a quantity from the catalogue to a supplier.

Fist³ also distinguished between E-Mail and EDI on the basis that

- EDI messages are highly structured whereas E-Mail is not
- EDI documents are transferred from application to application rather than the computer to computer link of E-Mail
- EDI is characterised by a chain of events rather than a single message

Of particular interest to records managers may be another aspect of the distinction between E-Mail and EDI offered by Fist.

"E-Mail Messages are deposited into a remote computer mailbox and are intended to be read and acted upon by a

human. EDI documents are also deposited in a remote computer mailbox but are designed to be read and acted upon by a series of computer applications running in automatic mode".

EDI System Types

There are three basic EDI system types, "One to Many", "Many to Many" or "Clearing House" and "Incremental Paper Trail". These are briefly described here.

One to Many

In this arrangement there is usually a major organisation at the hub of the system with the trading partners connected. A good example is in the United States where numerous hospitals are "connected" to pharmaceutical suppliers.

Many to Many, or Clearing House

These consist of many buyers and sellers or providers and acquirers interacting with each other. They are typically found in an industry group such as the automotive industry with parts manufacturers, assemblers and retailers.

Incremental Paper Trail

In this system arrangement documents are amended at each stage of the business process by a series of organisations.

Outline History of EDI Environments

The first major groups to seriously consider EDI systems were in the United States rail and road transport industries. In 1968 the US Transportation Data Co-ordination Committee (TDCC) was formed to co-ordinate the development of standards for all groups of carriers.

Two major factors drove the demand for moving towards an EDI environment. Unacceptable response cycles from manufacturers of retail goods and associated large holdings of inventories necessary for a buffer against unexpected demand.

This situation led to the progression of the Just-in-Time (JIT) and Quick Response (QR) concepts.

JIT is a method of inventory management based on ordering supplies in small batches for delivery just at about the time they are required. QR aims to reduce the time between the raw material processing stage and the sale of the finished products to as little as possible.

The major benefits of JIT/QR are realised when the entire vertical chain of organisations are connected in the "one-system". For example, it is now fairly common for major retailers to be electronically "queuing up" the next order on the central computer as customers are actually purchasing individual items at geographically separate outlets.

A good example of where EDI is used extensively and intensively as an integral component of ET is in the world airline industry. It would literally be impossible to sustain the current business volume without the EDI/ET environment.

Current EDI Issues

The current EDI issues may be categorised into three groups, standards, organisational and legal including security.

Standards

There are two main groups of standards issues, those relating to "documents" and those concerning technical aspects of systems. This paper focuses on the document standards issues. The issue of standards became apparent even before the formation of the TDCC in the United States. As a result of the TDCC deliberations the ANSI X12 EDI translation standards were introduced to cover all types of US originated documents. In the UK the Trade Simplification Body (SITPRO) undertook pioneering studies. SITPRO then worked with the United Nations Economic Commission for Europe (UNECE) to create the Guidelines for Trade Data Interchange (GTDI) document translation standards.

The two conflicting standards ANSI X12 and GTDI make true international EDI trade systems difficult.

European and United States EDI groups now formed the United Nations Joint Electronic Data Interchange (UN-JEDI) working party to develop a set of international document standards. The first EDIFACT (EDI for Administration, Commerce and Trade) document was an invoice followed more recently by a purchase order. A full range of international EDI business documents is planned for release over the next few years.

Organisational

Although there are numerous technical concerns associated with EDI it is the organisational issues that often assume most importance.

The historical and cultural profile of an organisation are key factors in determining the degree of preparedness to participate in EDI environments. Dynamic, innovative organisations, especially those operating in pressurised and competitive business environments, are more likely to manage the change process necessary to move to EDI systems. The airlines and banking industries are good examples of these and where a lot of work has been completed in recent years.

These organisations, prior to implementing EDI arrangements are typically operating in what may be termed as an integrated Information Technology based Business Environment. Stated another way, their managements typically regard information technology based systems as essential for conducting much of their business. This contrasts with other types of organisations where information technology has been implemented almost as an "extra layer" of processes with the traditional manual systems largely operating intact. In these organisations computers are often viewed, especially by operational staff, as having created extra work.

There tend to be several indicators or features of organisations where the technology is integrated.

- Most employees have a fair degree of computer literacy skills. A good example is where most people do their own word

processing instead of sending it to "word processing" personnel or secretaries.

- Mainframe computer based applications are linked to "personal systems" on personal computers to enable people to do local "value added" work with the data. This contrasts to organisations where there is extensive re-keying from mainframe produced printouts into personal computer systems.
- Intra-organisational office systems are prevalent and effective for example, electronic mail is used sensibly and paper outputs and copies have been reduced noticeably in recent years.
- Personal Computers with facsimile capabilities are being implemented into the overall office environment.

Especially for those organisations where it is not an integrated information technology environment, several issues should be considered prior to implementing EDI arrangements.

- The EDI implementation strategy should be aligned carefully with the information systems development and information technology installation plans. This is essential to enable all concerned to have a clear vision of how changes to the overall technology environment are planned.
- Work practices, including task and job definitions should be carefully reviewed to account for the changes inherent in doing business in an EDI environment. With EDI this often involves a holistic look at the business processes across the organisation.

It is usually insufficient to simply replace an existing manual system, or part of it, with a computer based equivalent. This has been the mistake in those examples where people consider computers have created extra work.

Generally, the "work practice analysis" is probably the major organisational issue in considering EDI.

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- Following from the "work practice analysis" it is essential that a comprehensive training needs analysis is conducted amongst all potentially affected staff. This must then be translated into a clearly understood and comprehensive training plan which is integrated with EDI implementation timetable.

A major issue for some organisations concerns the redeployment of staff where the nature of work is changed markedly. Obviously this is a sensitive issue which has to be handled accordingly.

Legal and Security

As EDI is, to a large extent, quickly changing the way business is done many of the legal issues and their implications have not been fully addressed.

There are currently a number of organisations and industry groups reviewing the salient laws, regulations and standards. In the United States the Legal Issues Task Force is operative, whereas in Australia the EDI Council has established a legal and audit committee.

Key legal issues centre on the two transmission types comprising the majority of EDI communications. The first is the sending of a unilateral notice and the second is where the intended result of the message is the formation of a contract.

An invoice is an example of a unilateral notice, and issues include the requirement for a signature, when it takes effect and what happens if the actual sending or contents are disputed.

There are numerous aspects of security which need to be satisfactorily resolved before EDI becomes the normal way of conducting business. These include

- Accounting for and storing business forms
- "Postmarking" of electronic transmissions in terms of origins and destinations
- Detection of forged business messages

A comprehensive account of the legal and security implications of EDI may be found in an

excellent publication published by the State Information Technology Group in the Western Australian Government Department of State Services⁴.

Impact on Records Management

The deliverables of EDI environments are clearly yet another aspect of the merging of information management disciplines being driven by the introduction of technology.

Although it is not doubtful whether the "paperless office" environment is feasible it is fairly certain that ET and EDI technologies have the potential to considerably reduce the requirement for paper-based records.

There are now enormous pressures in the business environment to migrate towards electronic records. The pressures are based on the widely held view that the "electronification" of records is cost justified.

To ensure that EDI proposals are properly handled, records managers need to ensure adequate involvement from the outset. There are several key areas where full participation is advisable.

Feasibility Study

During this initial phase of the project the ground rules and perceptions for the proposal get established. Therefore it is essential for records managers to clearly understand the full implications of the proposal and look very carefully at the cost effectiveness issues. In this phase it is worth bearing in mind that, traditionally, computer project costs are underestimated due to the prevailing optimism at the beginning of the project. On the same basis, benefits are often over-estimated, a factor which later may lead to disillusionment.

Steering Committee

All technology projects should be overseen or guided by a steering committee. My advice is that for any EDI type project the records manager should be an active member of the committee. This involvement may require

views to be fairly forcibly expressed on occasions to ensure that incorrect assumptions about the technology are not promulgated.

Project Management

The records manager must become involved in the project management plan, especially to ensure that all the organisational issues are adequately addressed in a methodical way. This is an area of prime importance because of the impact on staff in the records and related business areas.

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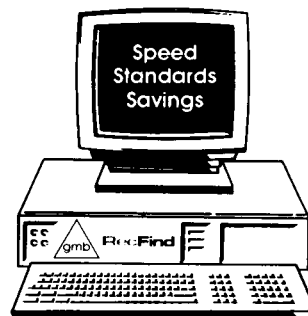
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COMPUTER VIRUSES:

AN OVERVIEW FOR RECORDS MANAGERS

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The impact of information technology has been felt by practically every aspect of the business world. The tremendous speed and accuracy of computer processing, mass storage capacity, widespread networking among diverse computing devices, and the instantaneous transmission of huge amounts of data, have permanently changed the way day-to-day business operations are conducted. Records managers have always played a vital role in introducing information technology into their institutions. Unfortunately, records managers must now be cautious concerning a potential threat to the security of their institutions in the event of a computer virus attack.

The main purpose of this article is to provide a framework by which records managers may clearly understand the virus problem and to present some effective measures for recognizing and dealing with viruses. Various aspects of computer viruses are examined and documented cases of viruses are briefly described. Programs which have been created to combat viruses along with remedial actions to be taken in terms of preventive, detective, and corrective measures,

are presented. Because the potential damage to organizational databases by a computer virus could be enormous, institutions must minimize the threat by taking some affordable actions.

Definitional Aspects

What exactly is a computer virus? Some define the term as "...software programs with destructive features that can wipe out files or otherwise damage microcomputers" (*Business Marketing*).¹ Others define it as "lines of code hidden within software that can cause 'out-of-memory' messages, printing problems, system crashes and application malfunctions" (*The Office*),² or as "...unauthorized codes which secretly penetrate systems and which can wreak terrible havoc, including the destruction of files or memory." (*Editor & Publisher*)³ Computer viruses have also been defined as "...a computer program that modifies other computer programs to include a copy or possibly an evolved version of itself. The infected program then becomes a carrier and serves as a medium for spreading the virus to other uninfected programs." (*Internal Auditing*)⁴ Other definitions include: "...a small, mischievous program written by a hacker as a practical joke or as an act of vandalism... programmed to reproduce rapidly, debilitate hosts, and spread like wildfire through a variety of carriers" (*Datamation*)⁵; "a virus is unauthorized self-replicating code" (*Personal Computing*)⁶; "a virus is any program designed to enter a user's system without his or her consent or knowledge and interfere with normal operations, whether merely to display a message or to cause loss of data" (*Personal Computing*)⁷; or, finally, computer virus guru John McAfee asserts that "computer viruses are segments of self-replicating code that attach themselves to

application programs or other executable system components." (*Datamation*)⁸

Even though definitions vary, computer viruses have many common attributes. They are software programs which are hidden in other software, are unauthorized by the users, and are self-replicating by infecting programs in such a manner that a copy or modification of the virus becomes part of the originally "healthy" software. The following definition emerges from these common attributes: a computer virus is a software program which secretly penetrates a user's system in an unauthorized fashion, becoming part of the program being used, ultimately making its presence known. Once in the user's program, the virus replicates by infecting other programs.

Close scrutiny of the above definition reveals that there are two facets to computer viruses. One facet is that viruses consist of three phases: infection, replication, and activation. The other facet is that viruses are not limited only to destructive programs. It is our contention that any program which surprises the user, whether annoying or destructive, should be classified as a "virus".

Worms and Trojan Horses

Whereas viruses are programming codes that become part of another program, "worms" are stand-alone programs that remain self-contained. They live off weaknesses in the host's logic. A "Trojan Horse" program appears to do one thing but actually does something else, vandalizing or intruding every time it runs.

How Computer Viruses Work

There is only one way in which computer viruses are transmitted. That is, by introducing and copying an infected file into the computer system. Mainframes, microcomputers, and network systems are all good entry points for viruses. Viruses attach themselves to boot sectors of operating systems, operating system utilities, or executable files of application software. Once the operating system is booted or the application executed, the virus takes control of the computer system. It is at this

point that the virus attempts the replication phase. The length of the replication phase varies, but actual replication is usually very fast. The frustrating feature of a virus is that the functioning of the original program initially remains unchanged. Most viruses utilize a "time bomb" component in their code. That is, the activation phase does not occur until a certain date occurs or a certain amount of time has elapsed. This is done to divert attention from the actual introduction of the virus. Therefore, the user does not usually become aware of the virus at the point of replication, but only once the activation phase begins.

The activation phase is the final phase of the virus. During this phase the virus is executed. The result can range anywhere from harmless (a message displayed on the computer screen) to disastrous (complete erasure of a drive).

Impacts of Computer Viruses

Viruses disrupt by displaying messages, tying up disk space, erasing files or storage devices, and destroying hardware components. There may be different versions of the same virus, having different consequences, with the potential of a re-attack. A "Bomb Threat" occurs when someone calls an organization and reports that there has been a virus introduced into the computer system. Whether true or not, the threat should be taken seriously and the system analyzed to determine the accuracy of the threat. Obviously, this process is an expensive one in terms of the cost of vaccine programs, lost work due to computer down-time, and cost of personnel required for system recovery.

Reported Cases of Infection

Viruses have been known to attack all types of institutions. Yet, the number of reported incidents has been low due to the stigma attached, the inadequacy of laws dealing with the subject and the difficulty in implicating the author of the virus.

The *Pakistani Brain Virus* was created in 1986 by two brothers who intended to send a message to software "pirates". They infected their software and included their address and phone

number in the program so that legitimate owners would be able to call for a vaccine. This virus replaced the original boot sector of the operating system and replicated rapidly onto all bootable floppy disks. The infection, which was spread by sharing infected diskettes, ultimately caused the system to crash, losing data.

The *Scores Virus*, developed in 1987 at Electronic Data Systems, operated by infecting any application and increasing the size of the file. This virus, which was spread by exchanging infected diskettes, sought new hosts at three and one half minute intervals, created files, and looked for specific files to destroy, ultimately causing the system to crash.

The *Israeli Virus*, originating in 1987 at the Hebrew University in Jerusalem, infected executable files and increased their size. Some versions of this particular virus, which forced the program to remain resident in memory, were able to wipe out the hard disk. In earlier versions of this virus, a bug existed which caused the executable file continually to increase in size until it could no longer fit into memory. In later versions, however, hackers corrected this bug. Healthy programs were infected when they were executed in an infected system. The infection was spread by sharing infected diskettes.

In November 1988, Robert Morris, a graduate student at Cornell University, wrote a program which he introduced into the nationwide Internet network through an electronic mail system. Known as the *Internet Invasion*, this action supposedly was undertaken to point out two loopholes in the Internet operating system. However, through an error in program logic, a 1/15 chance became a 14/15 chance. The most outstanding feature of this infection was the rapidity with which it spread through a national network.

What must be done

Users must protect their valuable computer resources from virus attack at three levels: prevention, detection, and correction. Each of these levels can be implemented through user

education, management policy, and hardware/software.

Preventing Viruses

When implementing preventive measures, organizations must seek a balance between defense of the system and the free exchange of information within the system. This balance must be in accordance with the culture of the organization. Also, it must be realized that procedural control is only as good as the level of compliance.

Common sense is especially useful in preventing a virus attack from occurring within the organization. Precaution must be taken when installing any computer system, before a local area network is implemented, to ensure that a thorough analysis of security requirements is done. Policies concerning security and potential risks of non compliance must be clearly explained to users. A recovery program must be in place for contingencies. An isolation mechanism (eg. authorization layering) may be necessary to segment computer files by function, by user, or by "classes" of information, depending on the sensitivity of the data.

Care should be taken when handling passwords. Used properly, passwords can be an extremely effective tool. Passwords should not be shared or terminals left unattended after an individual has signed on. Never base passwords on birthdays, names, etc. which would be easily accessible. Passwords must be changed from time to time, especially when a security officer or an individual entrusted with confidential access leaves the organization. Also, passwords can be used in combination with key devices (such as a card which contains personalized information concerning the user). One useful technique for guarding against guessing of passwords is the inclusion of a punctuation mark in the secret code. Before new passwords are put to use, they should be extensively tested by programs designed to guess passwords. Finally, a system access log should be maintained to allow detective control against unauthorized or unsuccessful attempts.

Another means of prevention is to maintain a backup, which is a redundant system

component. The backup unit can be hardware and/or software (which includes duplication of both program and data files). One means of backup is a stand-by computer system which can be utilized in the case of failure or breakdown of the main system. Although redundant units normally consume more resources, it has been widely recognized that redundancy is an effective measure in dealing with errors. A thorough, systematic analysis of security requirements can determine the required level of redundancy. As Cashell and Waggoner (*Internal Auditing*)⁹ assert, "...conscientiously applied backup procedures will eliminate 99% of a virus's potential for damage." However, be aware that if the files were infected before backup was accomplished (ie. before the virus had entered the activation phase), performing a restoration of file/program/data would recontaminate the system.

Vaccines are software programs which generally remain resident in memory, watching the system for typical signs of virus activity by noting file accesses as well as programs that are loaded into memory. Vaccines are primarily to prevent viruses from infecting the system. In the event typical symptoms of a virus are noted, the vaccine will hold up the system, sending a message to the user. Although vaccines may, on occasion, give a false alarm that a virus is attempting to enter the system (when actually only a normal computer process is taking place), still, when used conscientiously, vaccines can help prevent catastrophes resulting from a virus attack. An up-to-date list of approved software should be maintained so that only those approved programs may be rerun following a virus attack notice.

Special cryptographic hardware systems enable confidential data to be encoded in such a manner that the data becomes useless to anyone who does not have the decoder key. Other hardware prevention measures include usage of disk locks, jackets, option boards, and call-back devices. Also, biometric devices, which identify people according to physical characteristics, have been recently introduced. It must be emphasized that a systematic testing procedure can significantly enhance the effectiveness of all preventive measures, software, as well as hardware.

Detecting Viruses

As with any other type of security problem, absolute prevention from virus attack is almost impossible to guarantee.

When a virus manages to bypass all preventive measures, detection is a necessity. Detective vaccines work on the principle that virus infections are detectable after they are introduced by locating the infection traces. These vaccines constantly monitor the executable files and the boot sector. These are compared with a previously recorded "picture" called a signature, which contains the date and file size at a given point in time. If a variation from this signature is recognized, the vaccine program warns that there is a "crisis" situation. This allows appropriate corrective actions to be taken before the virus attack results in disaster.

Some detective vaccines use an algorithm, a self-check routine in each program, to determine if the program code has been altered. This type of detection vaccine, however, will probably not be effective on a virus which attacks the boot sector of the operating system. Furthermore, should a virus enter the replication phase before the self-test is administered, its effectiveness would be severely limited.

Correcting Viruses

In the event that a virus is detected, the virus must be isolated immediately and the system shut down so that the virus cannot spread. The system should be turned off and rebooted in order to remove any virus from RAM. Any disk storage device that has been infected should be reformatted and software should be reloaded, from the original source diskettes, provided these have not been infected. Data should then be restored as much as possible.

Corrective vaccines are usually written to combat specific viruses, by searching for characteristics that are unique to that particular virus. Once the vaccine isolates the virus, it either deactivates it or destroys it. A destruction vaccine is directed against a specific virus since, in order to identify and remove a virus, a thorough analysis of the programming code of the virus must first be performed. One word of warning - some

viruses have been made to appear as vaccines. Therefore, in attempts to obtain protection through vaccines, virus infections may actually be spread. Also, because restorative vaccines must dissect and analyze the code of a virus to determine how the virus works before carrying out any correction action, the vaccine always remains one step behind the virus. Two excellent expositions on antiviral software may be found in the April, 1988 edition of *Computer and Security*,¹⁰ and in the *Proceedings of the Tenth National Computer Security Conference*.¹¹

Maintaining a Healthy Environment

To further guarantee a healthy system environment which is free of viruses, several actions should be taken. An awareness should be created among all users of the potential threat of viruses and the damage which could result from a virus attack. Users should be educated concerning viruses and advised only to copy software from the original diskettes which were purchased from reputable vendors who are verified through references, associations, or user groups. Any software which is of an unknown origin is very risky and should be rejected immediately. Also, avoid copying from a bulletin board service. If you must use such a service, use only a stand-alone system and be sure to re-boot the system afterwards. Verify that programmers have thoroughly plugged all holes in the system (had the Internet network done this, they could have avoided a very big problem). Always designate files which are not to be overwritten as Read-Only. This action will almost certainly protect these files from a virus attack. Lastly, always use write protection tabs on floppy disks to prevent the virus from writing to them.

Conclusion

Potential damage from a computer virus is severe. Vaccines which reinforce security controls are available, which can help prevent virus attacks, detect the presence of virus infections, and, in the event of a successful attack, aid in correcting the damage caused by a virus. There are a number of practices, aside from preventive vaccines, which users should

follow to help prevent virus infection. Many of these practices do not require sophisticated technology or tremendous investment. The connectivity capability of computer networks, which has increased resource sharing, has also provided the perfect environment for virus attacks. Records managers, as well as all users, must work together to formulate an action plan to safeguard their valuable information resources from such attacks.

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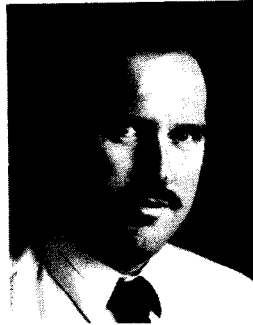
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RECORDS MANAGEMENT AND AUTOMATION

By Clive Finter, ARMA

Clive Finter is the Manager (Records Management Systems) for the Queensland Department of Transport. He has been in charge of government records offices for the last eight years and has conducted major reviews of corporate systems for two large departments. Clive is a tutor for Records Management subjects through the Queensland College of Distance Education and is a relief lecturer for the same course at Kangaroo Point TAFE.



This paper will compare and contrast the way/s in which automation may be applied to the records field.

Ever since the etching of the first record in stone, people have been responding to the challenge to find better ways to not only store information but also, and more importantly, transfer it and retrieve it. The assumption is made that prior to the introduction of any automated technology, the basic principles governing classification, indexing, document/file tracking, re-submit/bring-up requests, storage and retention/disposal are all in place, well established, accepted and used by both users and operators. On this basis I will compare and contrast various automated systems or processes and highlight their various benefits or disbenefits. I will deal with each of the elements by following the life cycle of a record, that is, from creation through its active phase to its final disposition.

In the beginning there was a word, it was put with more words to make a letter and it was sent to someone asking them to either **do** something or **for** something. Either way the letter created a record and required a reply and the letter and a copy of the reply were required to be retained as a record of the actions. Today, technology and

automation are pandering to the 'I want it **now**' syndrome to such a high degree, that the records manager's task of trying to control and record information flow and transfer is almost impossible. This is the result of increasing corporate use of **electronic mail** and **facsimile transmission** of letters. Each of these processes introduces different problems for the records manager.

Electronic mail essentially replaces the hard copy memorandum or inter office letter and arrives at its intended destination much faster than the typed alternative. It is realistic to assume that a reply or resultant action will be taken much quicker when generated through electronic mail. The dilemma for the records manager is that the potential exists for there to be no lasting record of either the request or the subsequent action taken. I will accept that a proportion of electronic mail traffic is informal and of no lasting value to the organisation. However, for the documents which should become part of the corporate memory of the organisation, there should be controls administered by the records manager to ensure their retention. Each officer who either receives or generates electronic mail should abide by these controls as they are likely to be identical to those used to control the incoming mail from the post office.

Facsimile transmission of memos and letters would have to be one of the most abused forms of automation in use today. In the organisation for which I work there are almost 200 facsimile machines. The rate of daily transmissions both internally and to and from client organisations is phenomenal, to the point of being ridiculous when a day later, the original copy of a letter which has been previously faxed arrives without any notation of the fact that it was previously faxed. As with electronic mail, fax operators need to be trained to identify documents which are being transmitted or received which should be recorded in the corporate memory, and should then take appropriate action to forward a copy to the appropriate records area.

Irrespective of the volume or ways of generating electronic information, in excess of 90% of the records held by most organisations is still paper based. In attempting to record the receipt and track the processing of correspondence, many organisations are turning to computerised systems to perform these functions.

Correspondence tracking and text retrieval systems are being used with differing levels of efficiency to replace manual systems, many of which were quite adequate. I am far from convinced that the expense and resource allocation required to support these systems are justified. Today's executives seem to be caught in an information whirlpool and have so much spray in their eyes that they cannot see that good records management can provide the rudder to steer them not only out of the rapids but also keep them on course.

Correspondence tracking and text retrieval systems require an inordinate amount of data entry. If any are required to be linked or cross-referenced to the records system, then additional research and referencing is required, all of which adds to the time required for initial processing. An often ignored factor of correspondence tracking systems is the amount of time required to update the system to record the processing details to the point of finalisation.

A well constructed and well managed file management system which is broadly made up of files which contain letters about the same subject, can provide all the necessary controls for correspondence management during the active phase of a documents life cycle with a much lower workload and therefore fewer resources. Large systems like this can be maintained quite well without computer assistance. With a well constructed classification scheme and a well maintained indexing system working in conjunction with controlled procedures for the one point receipt of incoming correspondence, records centre staff can quickly determine the location and point of process for any letter attached to a file.

My research indicates that the managers of sites which use correspondence tracking systems claim that they are necessary 'in case' they

need to find out if they received a letter and if so, what happened to it. **In most instances 90 to 95% of entries are never referred to again, so where is the justification for continual resource allocation.** The 5 to 10% which require an enquiry type follow up can be adequately serviced by the records centre staff.

I will concede that as software products improve, there are some functions such as statistical analysis and reporting that are a real bonus when the system can produce the reports in the required format as required. These benefits, however, should still be costed to justify the initial and continuing resource requirements.

I have already mentioned some of the essential elements of a good records management system and now add file tracking and archive management to tie up a neat bundle. For many organisations these activities can be carried out at very high levels of efficiency and still be cost effective when left in the **manual** mode. Let us regard efficiency as being 'doing the thing right', and effectiveness as being 'doing the right thing'.

Computer assisted records management systems, while being innovative and providing access to many useful tools, are not necessarily the 'be all' and 'end all' of records management. It must always be remembered that these systems in particular, and computers in general must never be allowed to become our masters but must remain as the servant, and records managers have the responsibility to use these services to their best advantage.

One of the most useful functions of these systems is 'keyword retrieval'. This function allows a keyword or several keywords to form a search expression which the software will then use to search the database or data files and report the results to the enquirer. The enquirer then usually has the option of making a choice or initiating a further search with additional search criteria. In a records management system the result is a list of file titles about which all relevant details can then be obtained. The manual equivalent of this routine is a physical

search of the alphabetic index and possibly the cross-reference cards hoping that both of them have been kept up to date. It would then be a matter of consulting the file movement system to ascertain the current location, and depending on the resubmit system in use, you may or may not be able to find out what resubmits are logged against the particular file. There are definite benefits to be gained from a well managed and well configured computer assisted records management system.

There is quite a wide range of records management software on the market, some of which is hardware brand dependent, but as could be expected all provide the same basic functions with each one then providing special features or routines which make them unique. I have observed that when records managers write specifications for records management systems there is very little agreement on what functions should be mandatory. When this is added to the single user and/or multi-user capabilities of some systems and the identification of the operating environment (DOS, Unix or Xenix) in which the system is to operate, then this only helps to support the claim that records management is an applied science and that the success is in the application.

One of the biggest problems in administering a records management system is being able to say with any degree of certainty where a particular file is at any given moment. The existence of this problem is not dependent on the size of the records system or on whether the system is computer assisted or manual. The size of the problem is solely dependent on the number of users of the system and the degree to which they own and have respect for **their** system. As we have observed and participated in the introduction of computer assisted records systems over the last six years or so, we have also seen the parallel development and introduction of **bar code technology**. The principle behind using bar codes to identify action officers and file numbers and associate one with the other through the records system software is a real breakthrough to potentially remove one of the most tedious, mundane and error ridden records centre functions, **manual file movement control**.

It is my observation that many registries using this automated facility are mismanaging not only the technology but also their human resources. Before bar coding was used in records management it was being used very successfully in such programs as assets management. This required someone to move throughout an organisation and record the physical location of various assets at the particular location and then return to a control centre and download the information into the system. Unfortunately, this is the same process which bar code salesmen, illiterate in the profession of records management, have sold to many inept records managers. There are many registries, justifiably using sophisticated records management software, which have retrained the person who used to sit and update the file movement cards all day to now wander around the offices all day 'beeping' the location of files into a portable reader. (Just as mundane and boring). At some stage during the day possibly at the end of the day, these readers are downloaded into the system to update the file location records. What a farce! By the time an enquiry is made to find the location of a file the information could be up to two days old and who knows how many times the file could have moved in that period.

The advantages to be gained from bar code technology are

- speed of data entry
- removal of the element of human error
- making a mundane job a little more interesting

By using bar code technology to control the movement of files in and out of the records centre and by equipping branch secretaries with remote on-line bar code wands and retraining them to use the wands and throw away their old file registers, the file location records in any corporate records system has every chance of always being up to date to give optimum service to the users. Every system, whether manual or computer assisted, however, has its problems. The executive who conceals a file in a briefcase and goes to a meeting will always beat the system. The records manager has to use other management skills to deal with this type of problem.

Another innovation steadily making inroads into the field of records management is **optical disk storage**. This technology was introduced into Australia by Olivetti in the mid 1980's with a product called 'Filenet'. This technology stores images of text or graphics on an optical disk and after the image has been indexed using ancillary software, the image can be stored and later be retrieved by using the index terms or descriptors. There is today a range of these products available, the costs for which are becoming more affordable.

Records managers need to be particularly cautious in identifying systems which may be suited to the application of optical disk storage. This is because optical disks are presently guaranteed for only 20 years, and when you consider that some of the information filed in your system may hold archival status and be required to be retained permanently, then optical disk storage does not become an option. Optical disk sales representatives defend this claim by saying that you can copy the contents of an old disk on to a new one, but who is to say that there will be a machine to read the disk in 100 years time. This is exemplified by the holdings in our archives of computer punch cards for which there is no longer any machine able to read them.

One of the crises facing many organisations today is storage space, and the State Government Departments in Queensland are no exception. The crisis for the Government is accentuated by the fact that the State Archives is also at capacity and will not be able to offer any relief until new facilities are available around 1993.

To plan for and cope with the enormous volume of records which must be retained at the end of their life cycle, records managers should consider the somewhat expensive yet economic alternative of **microfilming**. There are a number of crucial issues which should be addressed when looking at this option. The processing of the microfilm must be guaranteed to be consistently within the grey scale specified by the archival authority. There must be quality management controls in place to ensure that a quality product is consistently produced. There

must be a facility where the records to be microfilmed can be prepared for filming. That is all backing boards, pins and staples must be removed, torn papers must be repaired and ragged edges must be trimmed. This is a time consuming exercise which requires the allocation of full time resources if the camera operator is to be kept working. I regard microfilming as a better alternative to the mass storage of paper records and a better alternative to optical disk storage for the long term management of records at least for the immediate future. When optical disk technology has the capacity to download documents in a prescribed sequence to COM or microfilm, then, depending on the price effectiveness, I may be interested in using optical disk for the management of current records.

In looking at these various areas of automation I have attempted to place them in the context of modern records management and emphasise the functions and cross-functions they have to play.



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ELECTRONIC RECORDKEEPING IN THE MMBW

by Carolyn Theodore, BA

Carolyn Theodore is completing an MA (Archives and Records) at Monash University. She recently undertook a study tour of Canada and has worked on a number of records and archives management projects in Melbourne as part of her studies.

This paper was prepared for the MMBW following Carolyn's review of its Electronic Mail system. It is reproduced here in shortened form with the permission of the author and the kind agreement of the MMBW.

Introduction

"How does an E-Mail system change the character of communications within an office?¹ David Bearman asks this question with reference to certain areas of concern, whether the nature of documentation changes, where are new communications coming from and how are they filed? This study deals with each of these points to varying detail.

Records need to be controlled, whatever the medium they are stored on, to ensure accessibility and to cope properly with the accountability issues facing the organisation. At the Board of Works, records are controlled by the file management system, a computer-assisted paper-based registry system that is operated by the records management department. The physical and intellectual controls built into this system have allowed the MMBW to comply with Freedom of Information, to dispose of records legally according to Public Record Office approved disposal schedules, to protect the integrity of records and to provide a system that is efficient and trusted by users.

These controls, however, relate only to paper documents and records. As E-Mail becomes more entrenched and its use at the MMBW more sophisticated, the important documents created, maintained and received will need to be somehow controlled as paper documents are. Electronic records are still official MMBW documents, and as such, they are subject to

exactly the same requirements as paper records, and should be part of the MMBW's records management program.

E-Mail is used to varying degrees of sophistication at the MMBW, from memoranda to reports. It is at the level of reports and official letters, that the transience of E-Mail becomes a concern, as the paper equivalents are those documents that are requested under FOI and have legal disposal requirements. Recent development of communication standards for Electronic Document Interchange (EDI) will take E-Mail into new and more significant directions than was the case in the 1980's. The MMBW now stands on the brink of this major change.

If E-Mail technology is increasingly the carrier of documents that possess qualities that require attention in the above areas, it should logically follow that the records management department must devise ways of fulfilling their duties in these areas. My hypothesis that important government documents are being created, transmitted and received via E-Mail channels and that some records requiring archival and disposal action linked to legal considerations were in existence (to a degree not initially known at the MMBW) was borne out by my findings.

If the records management department wishes to accept the challenge of being fully involved in the management of electronic records, in particular E-Mail (which includes facsimile transactions), it needs to become knowledgeable and involved in areas which it may have considered foreign to it before. Records management has a great deal of expertise in records control, in fact, some traditional techniques can be seen to be emulated in automated systems. It can draw on its vast knowledge of traditional classification, indexing and keywording. It may be possible for it to be used in the effective control of electronic records in every region and department, at every level, and at every stage of their life cycle. This knowledge, combined with the fact that all records of every medium are its responsibility,

gives the records management department a very strong basis for wanting to be involved in current E-Mail systems and future technology.

The use of records management skills in approaching the problem of E-Mail will not only be beneficial to the Board of Works and its records, but will ensure that the records management department has a future in record-keeping at the MMBW. The records management department can assist in the transitional period between two systems, one that is controlled, but facing obsolescence, (the paper-based system) and the other that is reliant on user cooperation for some small degree of indirect control (Electronic Mail). They can work on the improvement of the current system while striving to ensure their future involvement in record-keeping at the the MMBW. In other words the records management section should "go with the flow" while at the same time thinking ahead.

As will be demonstrated, records management skills appear to be a hidden resource. The MMBW could probably avoid future backlashes concerning destruction of records, poor compliance to FOI, lack of accountability, poor administrative efficiency, and decision making as a result of inappropriate record-keeping, in the transitional period, if it is made aware of records management's unique knowledge and experience. While the technology (or insufficient realisation of its potential) is responsible for the problems discussed in this case study, the effective and careful use of its potential, can also provide the solutions. A classic example of the disease and cure in the one body. The records management department could assist in achieving the goal of effective control of electronic records - if planning begins in earnest very soon. This report sets out a series of recommendations that could assist the records management department in ensuring itself a role in future electronic record-keeping at the the MMBW.

Why the MMBW was Chosen

The MMBW's system was an obvious choice for a study of E-Mail's introduction into an office where a traditional records management

system operates. This is partly because the system is very traditional, developed from the nineteenth century government model, but computer-assisted. It is also a good case study because of its excellent level of control, both physical and intellectual, over the paper documents it is responsible for. Any system seeking to control E-Mail in the broader sense, in a similar organisation should be striving to provide that same level of control in order to meet the legal and administrative requirements, as well as archival considerations, relating to record-keeping, whatever the medium. As the Board of Works is experiencing E-Mail use at various levels of sophistication and currently has sufficient control over paper documents, it is an interesting subject for the study.

The file management system helps the records management department achieve physical and intellectual control of the MMBW's records by means of established control points. All paper mail is received and sorted at a central point, classified and indexed, attached to a file and despatched, with all file movements monitored by the computer system, until the file is finally filed away. The records management department's control extends to monitoring important ministerial correspondence, secondary files storage and disposal. As records are controlled so well and thoroughly, users trust and rely on the records management department and Freedom of Information is well implemented.

The MMBW and Electronic Mail

Electronic Document Interchange technology facilitates the decentralised administrative unit by allowing matters to be actioned and completed by a single person with convenience and efficiency, without the more time consuming involvement of a central paper-based system that runs counter to future work practices.

Analysis of the use of E-Mail and facsimile transactions in the Board of Works revealed that transactions were being conducted with higher frequency than first anticipated and as well as routine and draft documents, high level document transactions, such as the preparation of important reports, were occurring. It is this

higher level of document that is subject to PRO authorised disposal schedules and FOI requirements. Such documents are being created, altered, transmitted, and disposed of electronically. They are not being captured in the way important records are.

If existing systems are failing to collect high level documents for suitable treatment, are other methods in existence, or can other means be adopted at the decentralised points where documents are created or received electronically? The issue here is how can the records management department assist?

Facsimile

The MMBW has experienced the universal and largely unexpected, explosion of facsimile use. The transmission of documents has developed rapidly from simple routine transmission, to multi-page documents that are of better reproduction quality, quicker and cheaper to transmit and are now possible to send confidentially. This combined with the increased number of facsimile locations that has necessarily accompanied more popular use of the technology and the product is uncontrolled, potentially important, document transmission and receipt at all organisational levels.

This situation has become entrenched because the "explosion" was not anticipated and consequently, no control procedures were defined. The history of the fax is a portent of things to come concerning E-Mail, (ie. terminal to terminal document transmission) as similar evolutionary procedures can be identified.

"Vax to Fax"

Vax to Fax is a facility of the All-in-One Electronic Messaging system. As the name implies, it allows documents to be sent from terminals to facsimile machines, or the receiver's computer screen via electronic messaging options. When a document reaches the recipient's facsimile machine, current output is like a normal "faxed" document. It contains the MMBW's logo and the same header information as electronic messages sent in the usual way. Documents can be transmitted to other All-in-

One users, or to a remote facsimile number, even if it is a machine outside the agency.

The system notifies the sender on the "outgoing message advice" screen, details about date, time, addressees, duration, details, number sent to, number of passages, and whether the message was "sent" or "failed".

Vax to Fax combines the convenience and presumed security of E-Mail with the ability to reach many more addressees, because, not only do more people have facsimile machines than E-Mail systems, system incompatibility is no restriction as the facsimile machine acts as an interface. Transmission can occur from any All-in-One user to any facsimile machine location.²

The risk from a record-keeping perspective is that the document may be created, sent, then may be deleted after it has been successfully transmitted. However, with proper controls over the subsequent fate of the internally created or "outwards" document and the received or "inwards" document, it could be a powerful way to capture facsimile messages that would often have ended up in an unofficial "filing system" at the best and at the worst, in the wastepaper basket.

Telecom "FaxStream"

Telecom "FaxStream" is a service not currently used by the Board of Works, but probably will be in the near future. FaxStream is a national network for facsimile communication that is transmitted over an exclusive digital network.

Benefits include

- facsimile transmissions are less likely to arrive incomplete, therefore, re-transmission is unnecessary
- less time required at the facsimile terminal
- frequent long-distance call result in cost-savings
- the FaxStream network is supported by a full back-up service

FaxStream features include

- multiple broadcasting
- message authorisation

- range of delivery options
- bulletin boards
- delivery confirmation
- confidentiality assurance - messages are accessed via a terminal password³

Undoubtedly, these features are excellent, particularly the level of confidentiality ensured. However, there are some potential archival and records management problems that can be anticipated for the future and ought to be considered before it is too late.

With ordinary facsimile transmissions to a machine location, at least there is a hard copy document as a result, admittedly on archivally inappropriate thermal paper, but at least it is in a tangible form that may possibly end up on the correct file. However, with E-Mail that transmits from terminal to terminal, the chance of a hard copy document being somehow filed correctly is slimmer. This is because of the tendency for users to consider E-Mail as a private system, and the documents they create to be different to those in the registry system, and also because electronically held information in these systems is by nature, under the control of its creator.

Electronic Mail And Its Users

As previously discussed, E-Mail is likely to have a similar evolution to conventional facsimile. Currently, more widespread communication and increased message sophistication are occurring at the MMBW. With the addition of the greater technological options that are available, a similar take-over could easily occur.

Apparently, E-Mail was initially intended to be used at the secretarial level. Contrary to the general belief, this does not indicate routine and low level messaging. My observations of E-Mail at the Eastern Region, suggested startling high level reporting in electronic forms. I am certain that if I had investigated further at the Head Office, evidence of more high level electronic documentation would have emerged.

E-Mail at the Board of Works was developed by MITS (Melbourne Information Technology Services) in 1989. It includes options for

- Word and document processing
- Desk management
- Time management
- Information management
- Business applications
- Communications⁴

It is termed "Electronic-messaging" and allows subscribing users full-time access to create, send, receive, delete, and file electronic documents. Its use ranges from very basic memoranda to drafts and final copies of important reports. If E-Mail does continue to follow similar evolutionary processes as facsimile, there is the potential that it will become an even greater problem.

Course Of Action: Within the MMBW's Capabilities

David Bearman stresses the importance of records managers proving that their credentials are deserving of a hearing, and when the time comes for them to have their say, that they actually have something worth saying and that what they say or fail to say, does not worsen the situation.⁵

Behind this, is the requirement that records management staff acknowledge that there are problems and comprehend the threats these problems pose. Only after this, can the current situation and further design issues be addressed.

1. User Education

It is recommended to employ a **user education strategy** in which records creators are taught

- the limitations of the E-Mail system
- the benefits to be gained by considering the future relevance of their documents. This prepares for the possible future situation that would require them to class the records they create in terms of their importance.
- to ensure that deletion only occurs upon the user's request and only after careful consideration of the record's potential importance
- to understand that documents created in this form are still the MMBW documents in the same way as word processed or typewritten

documents are. This is a problem as E-Mail systems tend to create an illusion of privacy and result in the misconception that the records are part of a private system.

- to ensure compliance with the current records control system. To achieve this, users need to be reminded of the practice they currently follow with paper documents, whereby printouts of relevant documents are sent for file attachment.

A recent Australian Archives pamphlet recommends a "Want it-Keep it-Print it-File it" approach. If an important electronic messaging document or facsimile document relates to a matter that has a file pertaining to it in existence, or if it were a paper document, and would have a file raised for it, it should be printed out and attached. The importance of this is that during the transition period from paper-based to electronic administrative transactions, which has clearly begun, records in this period are made accessible by the official system that is responsible for them.

As it has been determined that the use of E-Mail is for more than just messages, although the system's name implies otherwise, current arbitrary destruction practices ought to be curbed. Users must be reminded **not** to allow anything to be removed by the electronic janitor. Users must be also encouraged to elect their document's fate themselves; whether by deletion or filing - but at the same time stressing the Australian Archives warning about electronic records, "When it's gone, it's gone". Again, placing the onus on the user or document creator about the nature of their documents, prepares the framework for greater compliance with future systems.

There is a need to shatter the possibly widespread illusion that electronic messaging is a private system and emphasise the fact that despite its sophistication, it is just another item of office technology as a typewriter is. As documents typed on a typewriter are official the MMBW records, so are electronically generated, transmitted and received documents. This could be achieved by incorporating it into the current training courses run by the records management department or by circulating carefully written notices that advise of the potential importance of

every document that word-processor operators, facsimile and E-Mail users create, as the MMBW employees.

It is important to educate users and to persuade managers that the records management section has some solutions and stress how good record-keeping is part of a total risk management strategy. By establishing these things, the next stage of being involved in future planning will be easier to achieve.

2. Further Registry Involvement

It is only by the records management section becoming involved (as a member) on planning committees or in working groups of future automated systems, that records management and archival requirements are likely to have any chance of being considered. To increase the possibility of being included in any further design and planning, the records management department must firstly promote itself as having relevance in the matter and by proving that not only should it be involved, but that it has something valid to contribute and can do so in a logical and competent manner. Achieving this recognition would involve the following action

- Making clear, records management's control of paper records
- By demonstrating their importance and ability in what management could consider to be a foreign area which does not involve records management
- Stressing the accountability issue, which if well argued and presented, would likely be a draw-card in ensuring records management an active contributing role in the crucial planning process
- The records management section needs to arrive at a position from where to convince the appropriate people that it can be involved in future design and planning of automated systems. Acceptance within the MMBW that the current records control program will be relevant within electronic record-keeping processes is essential.

Records management should be consulted in the early stages of system development.

In order for records staff to be employed in the areas suggested in his report, the first step is to develop and promote records staff's knowledge and involvement. The records management and archival team need to have a sound understanding of the technical issues and be able to convey their thoughts convincingly.

In particular, records staff should be involved in evaluating E-Mail systems to ensure that they achieve the appropriate level of development (matching the quality of the paper-based system) so that the MMBW's needs are met with regard to

- creation, maintenance and accessibility of current records for the MMBW's purposes
- ensuring the security and integrity of records
- public access and Freedom of Information
- disposal of records according to legal requirements
- archiving of records

More extensive and expert evaluation of E-Mail systems in operation at the MMBW would need to occur, as would E-Mail use at every administrative level in order to determine the types of documents that ought to be treated differently and what system inadequacies are present.

Course of Action: Electronic Mail Standards

Archival and records management requirements of E-Mail systems include automatic archiving of important documents for archival appraisal, ensuring appropriate disposal by automatically linking document types with retention periods, the ability to communicate widely via international transmission standards and the implementation of descriptive standards that facilitate data exchange.

With the file management system's indexing capabilities, not only are paper records accessible, disposal is assisted by the automatic assignment of retention periods to pre-determined records series. In order for E-Mail messages to be as accessible, well controlled and properly disposed of, similar controls, including systematic indexing and classification, would be essential.

As the following discussion will confirm, the Board of Works has access to technology that could allow future compliance to the standards being developed. As are the standards, the MMBW's electronic messaging system is still at early stages of development and many improvements can be envisaged.

Standards for E-Mail regarding archival preservation of documents are being developed by the United States government and UNESCO among other bodies. In order for E-Mail systems to comply with future standards, the section entitled "Additional archival and records management requirements for E-Mail systems" will mention other important and recommended system capabilities. This section is by no means a comprehensive appraisal of the MMBW's E-Mail system, it merely outlines some areas where more detailed consideration is likely to be necessary.

The MMBW does not have to solve the problems, just be aware of them and account for them in its role in the planning process.

1. The File Server

"The file server also functions as an electronic corporate archives where documents are stored after the appropriate official has signed off."⁶ This is a good way of ensuring that records are properly created, maintained and disposed of because archival considerations are taken into account at the earliest possible stage. In this way, important documents have a good chance of fulfilling their administrative and evidentiary function as well as surviving to be archivally appraised.

The closest thing to a file server with the MMBW's system is "Auto-Forward" which allows messages to be automatically forwarded to another user's "InBox". Yet, because it only forwards mail, does not make a copy for the initial recipient, and does not routinely forward mail, either received or created, it does not act at all like a true file server that is able to act like a paper archives system.

According to MITS' Software Development Specialist, with effort, a central point could be

set for **all** filed documents to go, but not for pre-designated document types, (as discussed in the following section - Message Sophistication Distinction), which would be technically possible, but would be considered unjustifiable in terms of labour and cost by management, and therefore virtually impossible.

2. Message Sophistication Distinction

If it is possible at the document creation stage to make a distinction between memoranda, routine messages, drafts, and executive mail, automatic archives transfer and retention periods can be implemented by the linking of document types to disposal requirements. Making disposal decisions at this earliest possible stage is the best way to prevent unauthorised destruction of electronic records.⁷

With the All-in-One System, or OASYS, no such facility is available. Again, reprogramming is possible with some difficulty but unjustifiable. As it is such a basic system, such sophisticated enhancements would render the system, grossly over-engineered.

3. CCITT X.400

The main recommendation of the 1985 United Nations Study report entitled "Computer-Based Message Systems Interconnection" - "COMICS" was the adoption of an International Standard for E-Mail - "CCITT X.400 series of recommendations for message handling systems and related standards". It is of major importance as it "would allow transparent communication between computers of different manufacturers and different networks."⁸

One excellent feature of the OASYS is that although special access has to be set up, it does allow transmission by the CCITT X.400 standards. This potentially opens the door for international E-Mail communication for the MMBW.

What is generally required is greater sophistication within the system to allow control over **document**.

- Creation and Receipt
- Classification

- Scheduling
- Maintenance and Use

The establishment of these system capabilities would be advisable before users start extending their use of the communication capabilities of the system.

4. Archiving⁹

The MMBW's system ostensibly has the capability to "archive" by storing E-Mail files off hard disk onto magnetic tape. However, past utilisation of this facility proved the data to be non-retrievable and therefore it is not used. A more archivally sound means is for Computer Output Microfilm (COM) to be generated and this could be achieved with minimum effort. If the use of COM is to be suitable, issues regarding the indexing and retrieval of its contents need to be addressed. The electronic janitor which routinely clears any unattended or unfiled messages to the wastebasket, from where they are deleted after a certain period, ought not to be automatically performed, as this is no way for disposal of potentially important documents. In this way, it is possible for important records to be deleted simply because the recipient has been ill and the message has not been read and attended to. In the paper world, it would still be in the person's "in-tray" upon their return.

5. The Header¹⁰

The OASYS header features names of one or more addressees, subject, and title (with keywording field possible). It would assist in retrieval if these were thesaurus controlled and could be classified and indexed in a similar way to the paper-based computer-assisted registry system. Sender and computer allocated message numbers would also be good additions to the message header.

6. Document Alteration Details¹¹

The OASYS system allows on the "Show Message Status" screen, all previous addressees, fulfilling a basic requirement. As the details of the transaction provide the evidentiary value to a record as much as its content, message alterations and subsequent users who do the

alterations, ought to be listed to aid in document integrity. Together with password or electronic signature access approval to amend certain classes of documents, records can be verified. This is similar to the presence of stamps, seals, and file movement details in the current file management system and even earlier manual registry systems.

7. Indexing and Searching¹²

Keyword searching is possible on the keyword field and title field. Full text searching is currently possible, but not taught to users. The system designers' belief is that it would unnecessarily impede the system by slowing it down. Inputting into the keyword field is not mandatory. It would be an improvement if either it was a required entry field or keywords were automatically assigned from the title.

Charles Dollar sets out four archival and records management requirements for information software

- Automatic indexing of documents
- Automatic assignment of retention/disposition instructions
- Automatic creation of an archival database
- Convenient electronic transfer of archival databases from a network file server to a central archives¹³

None of these are possible with OASYS. Retrospective programming changes to achieve this would be difficult, time consuming and unjustifiable. Many of the requirements and standards are features of successful paper systems. There is obviously good reason for the emulation of paper-based controls in electronic systems.

Conclusion

In order to be considered as players in the electronic record-keeping stakes, the records management and archival team must be well researched in electronic record-keeping and technologically knowledgeable in order to be coherent and effective in discussion and consultation. Opportunities will be wasted through vague and unconvincing presentations.

Records management requirements need to be clearly understood and articulated if they are to be conveyed confidently and soundly. It will take time for the skills and knowledge to develop, but now it is time to start.

* * *

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Continued on Page 59

DIARY DATES AROUND AUSTRALIA

DATE	TOPIC	LOCATION
August 14	REGIONAL MEETING NSW BRANCH	WOLLONGONG
August 14	ELECTION OF OFFICE BEARERS NT BRANCH	DARWIN
August 21	BARCODE APPLICATION IN A LARGE RECORDS ENVIRONMENT	BRISBANE CITY COUNCIL
September 12	FEDERAL EXECUTIVE MEETING	DARWIN
September 13-14	FEDERAL DIRECTORS MEETING	DARWIN
September 17	16TH ANNUAL GENERAL MEETING OF THE RMAA	DARWIN
September 15-18	8TH NATIONAL CONVENTION THE INFORMATION ENVIRONMENT TOWARDS 2000	DARWIN BEAUFORT INTERNATIONAL HOTEL

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Continued from Page 58

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FACSIMILE TECHNOLOGY

ITS NATURE AND EFFECT ON RECORDS MANAGEMENT

by Lisa Poulter, BA

Lisa Poulter is currently working on a Masters degree (Archives and Records) at Monash University. Prior to that period she completed a BA at Monash, majoring in Ancient History and Classics.

Records management in today's world often means dealing with automated systems in the transmission and storage of information. This involves coping with a whole range of new devices and the procedures used to operate them. However, one device that has been around since 1842 is currently leaping ahead in technological development; and that is the facsimile machine. The "fax" as it is more popularly known can be considered part of electronic mail systems which deal in the storage of information and the use of telecommunication media and devices such as satellites, radio or data communication networks. During the 1980's there were four major types of E-mail installations

1. Facsimile transmission
2. TWX (wire exchange) and Telex
3. Communicating word processors
4. Computer-based message systems¹

Over the last few years the fax has become the favored instrument for the use of imaging technology - the reasons for which will be further discussed in this paper. Technological developments and other issues in regard to the fax and some of the implications for records managers will also be examined. First of all, Electronic Message-Transfer Technology should be generally looked at so that fax technology can be placed in its relevant context.

The Impact of Electronic Message-Transfer Technology

The 1980's has seen massive advances in the field of electronics, particularly in the area of communications, which in itself has broad socio-political and economic implications as "The effects of technological change often reach far beyond the primary areas of intended

application".² The law is one area where the effects of electronic message handling is already being felt, as the law is slow to change and even slower to be implemented, there are increasing problems in dealing with the implications of the technology. Issues such as liability and jurisdictional boundaries for the regulation of the transfer of electronic messages are still being dealt with. Internationally there is the problem of transborder data flows.³ Kirby sums the whole situation up when he writes:

"The very technology which has linked computers by telecommunications renders laws, framed in terms of power over a particular territory, inconvenient or irrelevant in many ways."⁴

The technology can also raise questions about the evolution of society, the implication of certain trends in society and the impact that they may have on the individual both in the workplace and at home. Developments in electronic technology eventually lead to changes in the workplace and even more slowly to the home, with sometimes beneficial, sometimes detrimental effect. Certainly modern developments in the communications area has lead to an expectation of ever faster replies to correspondence and this has its own implications for records managers, particularly if this activity takes place within an electronic medium. The 'permanence' of a record is being called into question (particularly in regard to fax paper which deteriorates quickly) and also its validity. It becomes increasingly difficult to monitor the origin and changes of a record and indeed the meaning of what constitutes a 'record' is becoming increasingly difficult. In general the technology has its advantages and disadvantages. Some of these include

- increased labour productivity in the transmission, storage and retrieval of messages
- conservation of increasingly scarce resources
- decrease of relative costs to users

- improvements in the efficiency of businesses
- closer interaction among organizations and individuals
- increasing communication and links internationally
- the dehumanization of the workplace
- create new situations of liability
- threaten the privacy and freedom of individuals
- increase the gap between rich and poor
- lose the subtlety and nuances of message exchanges⁵

Whatever the advantages or disadvantages of the technology, one must accept that it is here to stay and how we relate to it is of vital importance. Part of our acceptance towards new technology comes through understanding, and this is just as important in the case of fax machine technology as in the case of other more "complicated" technology.

The History of the Fax

First of all it is important to understand what is meant by the term 'facsimile'. Costigan offers two definitions

1. A message medium whereby written, printed or sketched material is exchanged via wire or radio and recorded through electrochemical means without further processing
2. The system by which printed or graphic material is electrically transmitted and a copy permanently recorded at the receiving end⁶

The first definition is much narrower and excludes some material such as new photographs. However, the technology is basically the same.

The fax was invented by Alexander Bain in 1842 as a result of the development of the electric clock. Investigating a system of interconnected synchronized clocks, Bain discovered that each pendulum was roughly the same position at any given moment in time and that the master pendulum could be used as a transmitter of electrical impulses that could possibly be reproduced at remote locations.

In 1843 Bain developed the "automatic

electrochemical recording telegraph" which was based on the same design as he had previously invented but which also included a stylus, a "message block" and a suitable recording medium.⁷ It was not until 1865 in France that the system was first used commercially and it was also in France where developments in facsimile technology began to occur - particularly noteworthy is the work of d'Arlincourt, Ader and Belin. In England in 1850 Frederick Bakewell had improved upon Bain's design by replacing the pendulum with the cylinder or 'drum' type mechanism which still remains in operation today.

Although there were some developments in stop-start synchronization and in picture transmission, the technology remained mostly static until 1902 when Dr Arthur Korn improved upon the scanning technique of the fax. By 1910 Berlin, London and Paris were connected by fax, and in 1922 America also. It was in this period that serious commercial development of the fax began - mostly by American Telephone and Telegraph (AT&T), RCA and Western Union.

The fax began to be used increasingly in connection with newspictures, with distributing weather data and radio newspapers. The 1960's saw an increase in popularity of the fax as it became more accessible due to its being hooked up to the telephone network and because of desk-top transceivers which were relatively small, compact and easy to use. The 1970's saw the introduction of computer technology into the fax scene. This was an area that was slow to take off and which is still undergoing continuous development and change.

How the Fax Operates

Fax operates through scanning the document and then recreating it in terms of vertical lines per inch (lpi) and horizontally as pixels per inch (ppi), each pixel representing one point of the overall image.⁸ The CCITT standard for scanners for digital faxes is 1,728 pixels along a standard horizontal line of 215 mm, although businesses tend to use 196 ppi by 130 lpi. 190 ppi by 130 lpi is reasonable for 8-point type, 200 ppi by 200 lpi for 6-point type and 200 ppi by 300 lpi is suitable for 4-point type.⁹ The higher the resolution the higher the cost. 200

ppi by 200 lpi is therefore more expensive than 190 ppi by 130 lpi. For some images and for photographs higher resolution is needed.

Transmission speeds vary; "general-purpose business fax units using ordinary narrowband media range from 20 seconds to 12 minutes per letter size page. Special units that operate at 2 seconds per page require wideband transmission paths."¹⁰ Although the standard paper size is 210 by 297 mm there are devices to enable smaller or larger documents to be printed out.

There are also special applications for particular areas such as banks where remote signature verification can be checked using a fax with 5 inch paper width or engineering firms which may need larger documentation.

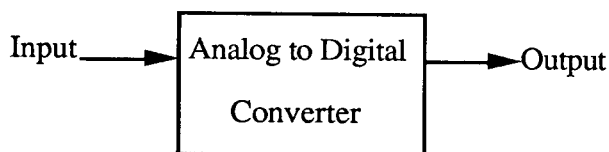
Fax machines need suitable transmitting and receiving devices. These devices can be either

- a) a transmitter and compatible receiver
- b) a transceiver (both transmitter and receiver)

Users also have a choice between half-duplex or full duplex transceivers. The former can only send and receive on alternate occasions, whereas the latter can do both simultaneously.

Computerized fax systems or 'Hard-copy store-and-forward systems' can be quite different. Basically what the system consists of is analog or digital units and a keyboard for the input of data to the unit. How the system operates is as follows

Analog Fax



Digital Fax



The input is mostly in ASCII and usually in compressed form to reduce the amount of encoding - this is of particular use in the storage of graphic material which takes up more space

than textual material. Glass fax systems are particularly developed for graphic storage; material can be redisplayed and also printed out in hard copy form. Other types of systems include combination text and graphic applications and merged text and fax systems where text can be placed over individual faxed images through the use of keyboard and transmitter and can then be reproduced in hard copy form.

The Fax Machine in the 1990's

With development of computers and telecommunication networks the facsimile machine came into its own. It was previously held back because of the lack of international standards which hindered communications between different machines. Since the adoption of a standard - largely through the work of the Comité Consultatif International de Télégraphie et Téléphonie (CCITT), a United Nations International standards body - facsimile has become widely accepted, so much so that special network facilities are now becoming available.¹¹ The CCITT established a number of standards for fax machines, and it is the Group 3 Standard under which most machines operate today. It is "a digital fax standard that allowed high-speed reliable transmission over ordinary telephone lines."¹² Built in Error Correction Modes (ECM) enables the receiver to check for errors in the material and if necessary to retransmit it.¹³ A group 4 Standard dealing with ISDN (Integrated Services Digital Network), 'switched data networks' or 'dedicated digital circuits' is still being developed. However, Glass states that it is

"so complex that only a handful of experts understand how to implement it. Furthermore, its popularity will almost certainly be limited, because there's no universal way. . . to use it over ordinary voice-grade phone lines and because equipment from different manufacturers can't interoperate."¹⁴

It is likely therefore that Group 3 will remain the facsimile standard for some time to come and Group 4 will be used only in certain instances.

The tie-in of the fax to the computer has seen the rapid expansion of facsimile services. The use of PC Fax Boards was first introduced in 1985

when GammaLink who had originally produced it as a means of extending linkage between mainframe and microcomputers soon saw the possibilities in developing it as a PC fax interface. Other vendors quickly took up the challenge, and by 1989 some boards became available for as little as \$150.¹⁵ Some of the advantages of a PC Fax are

- the end result always looks better as text, and graphics reproduce better
- broadcasts are simple
- the paper in the printer does not fade
- it is possible to preview faxes before sending them out
- there is the possibility of sending binary files to other PC's with fax boards
- hard copy isn't needed as faxes are sent directly from the PC
- an auto-redial feature can save time
- it can be programmed to send faxes at night when rates are cheaper

Some of the disadvantages include

- the fact that a computer takes time to boot up means that it might miss an incoming signal
- there is the cost of equipment to ensure good results whereas the fax already has a built-in scanner and printer
- the fax can contain some features not available on fax boards, that improve resolution, photo (grey-scale) mode, better data compression etc. There are even encrypted fax machines that guard against corporate espionage
- in some cases the PC fax can be much slower as they do not have 2-D encoding
- most PC Faxes can't receive material
- typical faxes won't fit onto CRT displays
- they chew up lots of memory
- in many cases faxes are sent upside down
- they can't receive faxes through a telephone switchboard

Alternatively there are also modems with the ability to send faxes but not receive them, although some of the quality is lost during transmission. However, they are convenient and that is their main advantage although prices are not cheap. Don Crabb recommends that they are best suited for offices that have already invested in a lot of equipment and which deal with large amounts of hard-copy fax material.¹⁶

Fax modems for IBM PC's have been available for some time but it is only recently that they have become available for the Macintosh.

Equipment currently on the market includes Fax 96. With the 1 Liner feature the fax can be tied into your answering machine service which automatically cuts off when a fax is being received. The hardware requirements are DOS 2.1 or higher, 3-84 Kbytes, a hard disk and floppy disk drive and a graphics display adapter.

Other companies are investigating the use of colour fax machines - the Colorfax system is being developed by StarSignal Inc., of Campbell, California. Using data compression it can reproduce a good quality picture in only three minutes - a process which formerly took three hours.¹⁷ Even in the home the influence of facsimile technology is being felt. It can be used to monitor responses to television programs and to collect catalogue information.¹⁸ In the area of imaging technology Intel is working with OCR vendors on new techniques that will eventually allow fax documents to be edited as if they were text files.¹⁹

There are many other developments that are currently being explored and it is plain to see that there are many difficulties in keeping up with the changing technology. Nevertheless the take up of a technology is often slow and depends upon market-place acceptance.

In contrast to some other technologies the fax is relatively simple and this is part of the reason for its enduring popularity.

Some of the Implications for Records Managers

According to Carlton Vogt the office of the future hinges upon the three concepts of imaging, communication and integration.²⁰ Part of the job of a records manager is to keep up to date with advances in technology and what this can mean in terms of record-keeping. This is not easy to do as the technology changes so very quickly. However, reading the latest journal articles in particular fields, communicating with those working in the area,

attending seminars and when needed going to the experts for advice can ameliorate this problem a little.

In terms of facsimile technology there are particular areas that we should be aware of. It is generally known that fax paper deteriorates very quickly especially when it is electrothermally recorded. A basic counteractive measure to this is to photocopy anything that you want to keep immediately before it fades too much to be of use. As Barbara Reed indicated in a recent *Informaa Quarterly*, records managers should be interested in providing guidance on the types of paper to be used throughout an organization. However, a search of the literature reveals no reference to standards for fax paper.

The last few years has witnessed an explosion in the degree of usage of the fax - there has been a doubling of the number of fax machines in operation every two years. Nedellec suggests that this is because "critical mass" has been achieved where fax is installed simply because it is so widely used and accepted.²¹ It has become increasingly popular because it is relatively cheap, relatively quick, relatively simple to use. B. W. Stuck warns that we should be aware of the current trends directed towards the usage of fax and be aware that these trends will probably accelerate.

He suggests that

"... fax may have a significant impact on electronic mail: history has suggested again and again that the simplest technology prevails, and fax appears to be simpler for most people to use versus electronic mail."²²

In an organizational context records managers should promote the smooth flow of these technologies within their organizations. Strict control of the 'paper flow' and the efficient use of information should be aimed for. Constant evaluation and the implementation of new technology is fundamental to the future success of an organization. Facsimile technology is only one small aspect of information technology but it is one that is going to play a large part in the future. Managing that future, not letting

technology run away with us is part of our role as information professionals.

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NOTICE OF ANNUAL GENERAL MEETING

**The sixteenth
Annual General Meeting
of the
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will be held at 9am
on Tuesday 17 September 1991
at the Beaufort Hotel
Darwin
Northern Territory**

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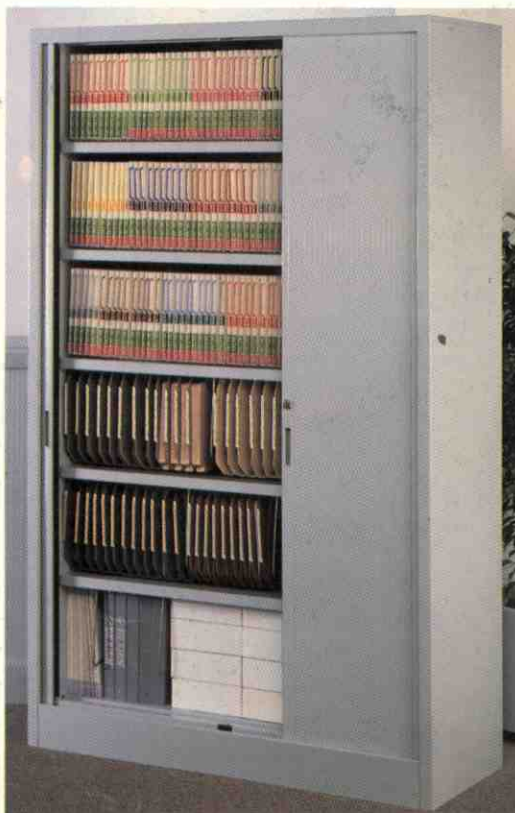
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