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THE USE OF MICROCOMPUTERS FOR AUDIT ASSISTANCE

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A research report submitted to the Faculty of Commerce, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the Degree of Master of Commerce.

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ABSTRACT

"There has been a remarkable increase recently in the number of portable microcomputers on offer in the market. This fact, allied to their improved communications capabilities and new software, now increases the likelihood of the widespread use of computer aids on audits. Although auditing is primarily a judgemental exercise, there is nevertheless scope for the use of microcomputers to achieve benefits both by way of time-savings and improvements in the quality of audit work". (1)

The major objective of this research report is to present the results of a survey which I conducted during October and November 1985 on the use by South African auditing firms of microcomputers for audit assistance. The report deals with a number of aspects relating to the use of microcomputers in the audit process. The major areas covered by the report are:

- the uses to which microcomputers are being put for audit assistance
- the benefits being derived from their use

It is hoped that the results of the survey and the conclusions reached will be of benefit both to audit firms and their clients.

DECLARATION

I declare that this research report is my own, unaided work. It is being submitted for the Degree of Master of Commerce to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to any other university.

Alan H. Chonowitz
Johannesburg
November 1985

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1. INTRODUCTION

"The advent of affordable microcomputers has brought incredible power and flexibility to even the smallest business. Accounting firms are especially well suited for integrating micros into virtually every area of their practices. In fact, accounting is one of the few professions that can use micros both in client services and firm management" (2). "Microcomputers are currently being used in many audit engagements and will soon become the auditor's constant companion" (3). Indeed, "there are already many auditors in the grips of micro mania" (21).

1.1 OBJECTIVES OF THE REPORT

The major objectives of the report are:

- To determine the purposes for which microcomputers are currently being used in the audit process by South African audit firms (chapter 4).
- To examine the benefits being derived by audit firms through the use of microcomputers for audit assistance (chapter 5).

In addition to these objectives, other issues have been addressed. These relate to:

- The number of firms using microcomputers for audit assistance (chapter 2)
- The reasons why certain audit firms are not using microcomputers for audit assistance (chapter 2)
- The hardware and software currently being used (chapter 3)
- The selection of audits for microcomputer assistance (chapter 6).

- Staff training and selection (chapter 7)

- Recovery of costs (chapter 8)

- Future trends (chapter 9)

1.2 PRIOR RESEARCH AND LITERATURE SURVEY

The use of microcomputers for audit assistance is a relatively new topic. As such there were not, until quite recently, many articles or books on the subject to refer to. Publications of a few years ago dealt with the increase in the use of microcomputers generally, control procedures relating to their use etc., but none specifically with the use of microcomputers by auditors. A technical report, dated August 1983 (4), had been prepared and is referred to later in this report.

However, there has been a significant breakthrough in the past three to six months and several accounting journals are now dealing with the topic on a regular basis. In fact, the Journal of Accountancy (USA) started, in June 1985, a permanent column relating to "micros in accounting", as "the computer revolution, sparked by the microcomputer is in high gear". (10)

My major sources of reference were:

- Accounting journals

- Firm publications

- Prior research reports

Reviews of the literature surveyed and the prior research are not detailed here, as they are discussed and examined later in this report in the respective chapters to which they relate.

It is important to note, however, that very little prior research exists relating to most aspects covered by this report and, accordingly, that the conclusions drawn by this report are based largely on my own research.

1.3 RESEARCH METHODOLOGY

The research techniques employed to achieve the objectives of the report were:

- a literature survey (1.2 above)
- a 'questionnaire' survey, responses being requested from firms of chartered accountants in South Africa.

There are more than one thousand registered firms of chartered accountants in South Africa. It was not considered practical to include all the firms in the survey and accordingly an alternative plan had to be adopted. An analysis of the firms revealed that the majority of them are in fact small firms with only one or two partners. The number of firms with more than two partners is only two hundred and forty six. This number excludes the various regional offices of each firm (i.e. if each firm is included once only, even though the firm may have several branches/offices throughout the country).

I decided that these two hundred and forty six firms would represent an acceptable population and considered that it would be preferable to seek responses from these firms, rather than to select a statistical sample from all the registered firms. Accordingly, questionnaires were sent to all firms registered in South Africa, with more than two partners. Where a firm has a number of offices throughout South Africa, the questionnaire was sent to the office with the most partners.

The questionnaire was accordingly sent to two hundred and forty six firms. The rate of response was as follows:

Number of questionnaires sent	246
Number of replies	70
% response	28,5%

The seventy replies represent an acceptable number from which to draw the conclusions detailed later in the report.

The results of the survey are referred to throughout this report. The survey will be referred to as "the 1985 survey". A copy of the survey questionnaire is included as an appendix.

2. THE NUMBER OF FIRMS USING MICROCOMPUTERS FOR AUDIT ASSISTANCE

2.1 LITERATURE SURVEY

In the August 1983 technical report referred to earlier (4). it was found that the use of microcomputers by the "Big Eight" firms in South Africa was still in the "embryonic" stage. The overseas offices of a few of those firms had begun developing software for use by auditors, but the final products had not yet reached South Africa. The only audit software being used had been developed by Deloitte Haskins & Sells, the firm regarded by that technical report as "the leader in the use of the micro for audit applications" (4).

This lack of use of microcomputers at that stage is supported by the fact that accounting and auditing journals, both local and overseas, made no mention of the subject at all. No software packages were being advertised nor training courses offered.

During late 1983 and early 1984, the position changed quite significantly. Several articles appeared in the overseas accounting journals, most notably in the Journal of Accountancy (USA) and Canadian C.A. Magazines. Microcomputer conferences were being advertised (5). The December 1984 edition of the local Accountancy S.A. magazine contained an article on the subject. (6)

Books on the subject were published in 1984. An example of this is a book written by Deloitte Haskins & Sells. (3)

Software packages were already being advertised in June 1984. (2)

From the literature survey, it appears that 1984 was the year when the use of microcomputers by auditors finally became a reality.

Great progress has again been made in 1985 by auditors relating to the use of microcomputers. Articles appearing in overseas journals refer to software packages currently in use and no longer to packages still under development. Writers are describing several uses for the microcomputers and their related benefits. Articles have appeared in the Canadian, American, English, Scottish, Australian and South African magazines. Large conferences on microcomputers are being held. (16)

In South Africa, several seminars have been presented during 1985 and others are being advertised. The seminars are being led by partners and managers of some of the bigger auditing firms as well as by lecturers from the universities and software developers. The seminars are being advertised and presented through the South African Institute of Chartered Accountants and other bodies (e.g. the Accountants and Auditors Special Interest Group of the Computer Society of South Africa).

2.2 RESULTS OF THE 1985 SURVEY

The results of the 1985 survey, relating to the number of firms using microcomputers for audit assistance, are as follows:

	Number of firms	%
Firms using microcomputers	23	33
Firms not using micro-computers	47	67
	70	100

These results are very different to those obtained in the 1983 technical report referred to earlier (4), where only one of the Big Eight* firms were found to be using microcomputers.

An analysis of the dates when the firms which responded to the 1985 survey first implemented microcomputers for audit assistance, is as follows:

Dates	Number of firms	%
Prior to December 1983	9	39
January 1984 - June 1984	7	30
July 1984 - December 1984	1	4
January 1985 - June 1985	4	18
July 1985 - October 1985	2	9
	23	100

These results confirm the conclusions which were drawn from the literature survey referred to in 2.1 above, viz:

- in 1984 already, several firms were using microcomputers for audit assistance. In fact, there were a number of firms using microcomputers even prior to 1984.

- 1985 has seen further interest and significant developments in the use of microcomputers by auditors.

2.3 REASONS WHY CERTAIN FIRMS ARE NOT USING MICROCOMPUTERS FOR AUDIT ASSISTANCE

The majority of this report deals with firms which are using microcomputers. However, I considered it important to ascertain the reasons as to why some firms have not begun to use microcomputers and, accordingly, included a section on this subject in the survey questionnaire. I was not able to trace any prior research or literature relating to this subject.

The results of the 1985 survey are as follows:

Reason	Number of responses	% (of total responses)
Lack of expertise in this area	17	25,4
Benefits outweighed by cost	16	23,9
Firm too small/clients too small	13	19,4
Considered unnecessary	11	16,4
Lack of awareness of benefits	6	8,9
Firm uses a minicomputer instead	2	3,0
Still investigating whether should be introduced	1	1.5
Audit work comprises substantive tests and analytical review only	1	1,5
	67*	100,0

(* some firms gave more than one reason).

The major reasons relate to:

- a lack of expertise/awareness of benefits
- the cost
- size of firm
- microcomputers being considered unnecessary

It is submitted that the only "real" reason relates to the lack of expertise or knowledge as:

- the cost factor is extremely low (3.2 below) especially when weighed up against the benefits. In addition, the microcomputers can be used to provide many new services to clients and thus increase fees
- the potential benefits, even to a small firm, are very significant (5 below).

3. THE HARDWARE AND SOFTWARE

3.1 *HARDWARE*

Very little is mentioned in the accounting literature relating to the choice of hardware and I was unable to trace any prior research on this topic. Three major points do, however, arise:

- the microcomputers should be truly portable as, if they are to be used effectively, they should spend most of their time "on-the-job" at the client's premises. They must be able to be "hauled around the office" (5)

- the hardware selected must obviously be able to run the required software packages. For this reason, it is likely that the I.B.M. personal computer, or compatible equipment, will be used most often.

- the required hardware is relatively inexpensive. A suitable microcomputer can be purchased for less than R10 000.

Firms included in the 1985 survey were asked to detail the hardware which they used. The results are as follows:

Hardware	Number of firms	%
I.B.M.PC	12	52,5
Apple	2	8,7
Osborne	2	8,7
Olivetti	1	4,3
Sharp	1	4,3
Hewlett-Packard	1	4,3
Commodore	1	4,3
Radioshack	1	4,3
The One	1	4,3
B.B.C.	1	4,3
	23	100,0

It can thus be seen that most firms are using an I.B.M.PC or I.B.M. compatible equipment.

3.2 SOFTWARE

The software used by audit firms for audit assistance can be classified into three main categories:

- packages developed by independent software houses

- packages developed in-house

- applications designed in-house which run using bought software which offers programming capabilities (e.g. applications which are developed using Lotus 1-2-3, dBase II etc. These are referred to as 'template programs').

The choice of software depends largely on:

- the size and needs of the audit firm
- the financial resources available to the firm, or to the international firm of which the local firm is a member
- the required features and system flexibility

In recent months the accounting literature, both local and overseas, has contained numerous articles and advertisements relating to software packages available for use by auditors. A list of these, together with their vendors and prices, where available, follows:

Software package	Vendor	Price
Audit Advantage	Informatics	US$3 000
Audit Cube	Blackman, Kallick & Company	
Auditing Performance System	Professional Services Microsystems	
Automated Workpapers	Linton Shafer	
Computer Assisted Audit Planning (CAAP) (developed locally)	Local Practitioners Development Centre	R495
Fast!	Financial Audit Systems	UK£ 295
Fast/CPA	McGladrey Hendrikson & Pullen	C$2 900
Fieldwork	Rubin, Brown, Gornstein & Co.	
Focus: ABC	Hemming Morse Inc.	
Glows Audit	Orion Microsystems, Inc.	
Pre-Audit	Coopers & Lybrand	US$1 950
Staff Accountant	Speciality Software	
Working Paper Indexing Sequencing Preparation and Reporting (WISPR)	KMG - Thorne Riddell	C$1 250
Working Trial Balance	WTP Software	

As mentioned above, not all audit firms need to select a software package from the above list. Several firms, especially the large international firms, have developed or are developing their own packages for use by their member firms/associates. This was confirmed by the technical report referred to earlier (4). Other firms have developed their own software using Lotus 1-2-3, dBase II etc.

Details of the software used by the audit firms which replied to the 1985 survey, are as follows:

Software	Number of firms	% (of total number of packages used)
Lotus 1-2-3/Symphony	8	17
Supercalc	4	9
CAAP	3	6
Wordstar	3	6
DBase II or III	3	6
Multimate	2	4
Multiplan	2	4
Pro-partner	1	2
Zardax	1	2
Audeal	1	2
WISPR	1	2
LHAIM (a version of Fastl)	1	2
Hapas	1	2
Superwriter	1	2

Software	Number of firms	% (of total number of packages used)
Pledge	1	2
Terminal	1	2
Chartfile	1	2
Macwrite	1	2
Seacas	1	2
MGE's partner	1	2
Kallweit Schuckermann	1	2
BBAPACK	1	2
Audit Advantage	1	2
Auditman	1	2
Visicalc	1	2
Wordpro	1	2
Calcresult	1	2
Audit practice support system	1	2
Various other in-house proprietary packages	3	6
	49*	100

(* A number of firms are using more than one software package)

The software used by these firms was developed:

	%
- Locally	38
- Overseas	62
	100
- By own firm/associated firm	44
- By independent software house	56
	100

In most cases, the firms advised that the software could be run using either a hard disk or 'floppy' disk.

Conclusions which may be reached relating to the software are:

- the software is relatively inexpensive
- a number of firms are developing their own software
- a number of firms are purchasing their software
- the popular spreadsheet and word-processing packages are often being used for audit assistance
- software developed locally exists and is being used by a number of firms

4. THE APPLICATIONS FOR WHICH MICROCOMPUTERS ARE BEING USED

4.1 *OVERVIEW AND LITERATURE SURVEY*

Magazine articles, software advertisements and other publications all deal with the many applications for which microcomputers can be used in the audit process. As one article describes it, "whatever can be done with paper, pencils and erasers can be done better and more cost effectively on an electronic spreadsheet". (5)

Any application which takes advantage of a microcomputer's capabilities is probably worth pursuing. The relevant capabilities of a microcomputer, together with examples of the related audit applications, include:

- the performance of computations quickly and accurately.
  Examples - ratio analysis, lead schedule preparation, tax and lease computations.

- the performance of repetitive tasks.
  Examples - preparing debtors confirmations, computing interest on several loans.

- the ability to change the format or structure of an analysis quickly and easily.
  Example - "what-if" analysis.

- the ability to allow the structure of a problem to be separated from the data needed to solve the problem.
  Example - setting up "time critical" analyses at the interim audit, when the final figures are made available only shortly before the year end deadline, as with consolidations.

- sorting, summarising and otherwise manipulating large amounts of information.
  Examples - monitoring client prepared schedules and debtors replies, time budgets.
- the ability to assist in organising a complex analysis or situation.
  Example - analysing internal control.

"Considerable repetitive work is traditionally associated with the audit process. Auditors must, for example, cast and cross-cast trial balances, prepare and summarise adjustments and reclassifications, construct bank reconciliations and generate many other routine work papers. Such work papers tend to be similar to one another despite the fact that they are done for different clients. The use of standard forms is perhaps the only technique that has been developed to save time during manual work paper preparation.

"Standardising and streamlining the audit process has long been an important concept. Auditors routinely use audit manuals, reporting guides and other tools to help them perform audits faster and more efficiently. Now that the average practitioner can afford to purchase a micro, a new audit tool is fast becoming standard equipment in the profession: automated work paper programs" (2).

The 1983 technical report referred to earlier (4) suggested that microcomputers could conceivably be used for the following applications:

- analytical review
- internal control questionnaires
- statistical sampling
- working paper preparation
- consolidations

- debtors' circularisations
- intercomputer interrogation
- time recording
- cash flow projections
- audit area selection

As mentioned earlier, however, the technical report concluded that only one of the 'Big Eight' auditing firms in South Africa had actually begun using their microcomputers for audit assistance at that stage.

The above are only a few examples of the many applications for which the microcomputer can be used.

As time goes by more and more applications will no doubt be found for which the microcomputer will prove to be a useful aid.

Note that the applications dealt with in this report relate to the use of microcomputers for audit assistance, and not to the many other applications which may be carried out by audit firms (e.g. for practice management).

4.2 RESULTS OF THE 1985 SURVEY

One of the major objectives of my research and this report was to determine the applications for which South African audit firms are using their microcomputers. A lengthy list of possible applications was included in the survey questionnaire (see Appendix). In addition, the firms were requested to add applications which were not included. The complete listing of the applications, and the number of firms which use each, is as follows:

Application	Number of firms
Recording and posting of adjusting journal entries	21
Preparation of lead schedules, working trial balances etc.	20
Drafting financial statements	17
Analytical review - ratios and statistics	17
Recording and posting of reclassifying journal entries	16
Audit time control/time budgets	13
Memorandum and report writing	12
Preparation of actual working papers (i.e. not simply a summary of client trial balance) - fixed assets schedules	12
Fluctuation (variance) analysis	12
Cash flow analysis (e.g. for going concern problems)	12
Materiality computations	11
Consolidations	11
Setting up subsequent year working papers	11
Trend analysis	10
Testing client computations (e.g. interest, depreciation)	10
Recording of work done	10
Preparation of actual working papers papers - tax schedules	9

Application	Number of firms
Standard audit forms (replacing existing manual forms)	9
Testing effect of journal entries without putting them through	8
Preparation of audit programmes	8
Debtors circularisation - letters	8
Preparation of actual working papers - lease amortisation schedules	7
Debtors circularisation - control of replies	7
Tax returns/computations	7
Preparation of actual working papers - foreign currency translations	6
Assessment of audit risk	6
Graphics - for analytical review	6
Debtors circularisation - evaluation	5
Communication between head office auditors and branch auditors	5
Study and evaluation of internal control	4
Flowchart preparation	4
Sample design (e.g. based on risk analysis, internal control reliance)	4
Sample evaluation	4
Regression analysis	3
Predictive testing (of year-end balances)	3
Interrogation of client files	3
Audit certificate control	2

Application	Number of firms
Obtaining information via Beltel or similar system (e.g. J.S.E. prices)	2
Communication between client and auditor	2
Stock and other certificates	1
Preparation of audit planning memoranda	1
Preparation of funds flow statements	1

In addition, fifteen firms indicated that their software packages have the facility to link to spreadsheet packages and fourteen the facility to link to a word processor. Eight firms indicated that their packages were being used to load information directly from client files.

Three of the most important features of the above analysis are:

- the most commonly used applications being the preparation of lead schedules, the posting of adjustments, the drafting of financial statements and analytical review procedures. In fact, several of the software packages in use were written solely for these purposes.

- the use of microcomputers for the preparation of standard audit forms and actual working papers, replacing their existing manual counterparts. This must surely be the first step towards the end of the working paper file as we know it today.

- the wide range of applications covered. Besides the application of professional judgement, there would appear to be almost no audit task which microcomputers are not currently carrying out in South Africa!

5. THE BENEFITS BEING ACHIEVED

5.1 OVERVIEW AND LITERATURE SURVEY

There are probably a number of reasons as to why the use of microcomputers for audit assistance has become so popular. These include:

- the low costs of the required hardware and software
- the high reliability of the hardware
- the relative ease with which modern software packages can be learnt and used, even by people with little experience in computer technology or programming
- aggressive marketing by software suppliers
- the number of smaller, less technology-orientated firms being taken over by the larger international firms
- a greater awareness by the auditing profession of the benefits which the microcomputer offers.

In addition to these reasons, it is likely that some firms are using microcomputers simply because it has become "fashionable" to do so.

This chapter focuses on the benefits being achieved through the use of microcomputers for audit assistance.

No prior research was traced relating to this subject. However, most of the articles on microcomputers and the advertisements for software deal with the benefits to be derived, and most agree that the major benefits are:

- the time savings involved

- the increase in audit efficiency. In discussing this efficiency, the International Accounting Bulletin describes the introduction of microcomputers as "a wake for the common pencil in accounting" (9).

The necessity to reduce audit times was dealt with in a Paper which I submitted to the University of the Witwatersrand in December 1984 (20). Among the conclusions of that Paper were the following:

- auditors' costs have, for a number of reasons, increased significantly over the past few years

- there is a growing resistance by clients to paying increased fees

- in order to combat rising costs on the one hand and to remain "competitive" on the other, auditors have to reduce the audit hours spent on each audit.

Various articles in accounting journals have described the time savings achieved by using microcomputers for audit assistance. Clearly, these savings will be welcomed by the auditing profession and their clients. Reported savings achieved through the use of microcomputers include:

- reductions of 25%-40% in audit times over a three year period (16).

- savings of over 80% on analytical review procedures (6).

In addition to the above, there are several other benefits which may be achieved. These are dealt with below.

5.2 RESULTS OF THE 1985 SURVEY

The survey questionnaire requested respondents to rank a list of suggested benefits on a scale of 0-5, as well as to detail any benefits not included in the list. The perceived benefits, ranked from the most important to the least important, are as follows:

Ranking	Benefit
1.	Time savings, especially in time consuming activities
2.	Increases accuracy of casts, tests, working papers, etc
3.	Improves staff motivation, as - Less routine clerical duties - Using microcomputer is 'challenging'
4.	Improves audit efficiency
5.	Allows for more time to 'think' instead of simply checking calculations
6.	Enhances firm's image
7.	Improved documentation
8.	Enhances profitability
9.	Improves staff's E.D.P. knowledge, which results in better computer auditing generally
10.	Results in consistency of working papers produced
11.	Improved time and budget control

Ranking	Benefit
12.	Improves audit planning
13.	Results in consistency of ratios checked
14.	Reduces staffing levels and thereby staff costs
15.	Allows for various alternative approaches to a problem being evaluated
16.	Improves audit programmes
17.	Provides the ability to do tests which used to be impractical
18.	Results in consistency of sample sizes computed
19.	Improved client service

Interestingly, in addition to the two benefits mentioned in 5.1 above, a number of other benefits are considered important. These include:

- accuracy
- staff motivation
- enhancing the firm's image

Before a firm decides against implementation of microcomputers for audit assistance (2.3 above) it is important for all of these benefits to be carefully considered.

6. THE SELECTION OF AUDITS FOR MICROCOMPUTER ASSISTANCE

6.1 THE PERCENTAGE OF AUDITS USING MICROCOMPUTER ASSISTANCE

The firms included in the 1985 survey were requested to quantify the percentage of audits where microcomputers are being used for audit assistance. The results are as follows:

Percentage of audits where microcomputers are used	*Number of firms*	%
1%-20%	12	50,0
21%-40%	4	16,7
41%-60%	4	16,7
61%-80%	2	8,3
81%-100%	2	8,3
	24*	100,0

(1 firm provided percentages for its Johannesburg and Cape Town offices - both are included above).*

The most interesting features of these results are:

- 50% of the firms using microcomputers are doing so on less than 20% of their audit engagements
- only 8,3% of the firms are using their microcomputers on more than 80% of their audits.
- there appears to be no audit firm in South Africa at present with the computer resources to use microcomputers on every single audit engagement.

6.2 BASIS OF SELECTION OF AUDITS

In 6.1 above it was ascertained that microcomputers are not being used on every audit. This implies that there are factors which firms are taking into account when deciding on whether or not to use their microcomputers on a specific audit engagement.

No prior research on this subject appears to exist. However, in a Deloitte Haskins & Sells publication (3), they conclude that it is generally better to use a microcomputer extensively on selected engagements than to attempt only a few limited applications on many engagements.

The firms included in the 1985 survey were requested to rank, on a scale of 0-5, the factors which they consider important in deciding on whether or not to use a microcomputer on a specific audit. The results, ranked from the most important factor to the least important factor, are as follows:

Ranking	Factor
1.	Number of repetitive and complex calculations required.
2.	Number of likely adjustments to year end figures and time taken to give effect to them.
3.	Large number of similar letters/reports to be produced which require minor editing only.
4.	Whether client prepares all required working papers or not.
5.	Engagement partner commitment to use of microcomputers.
6.	Whether a recurring or 'one-off' engagement.

Ranking	Factor
7.	Audits with audit areas which are 'time consuming'.
8.	Client expectations of auditor 'sophistication'.
9.	Working paper formats same each year.
10.	Deadline vs. non-deadline engagement.
11.	Likely assistance from client in setting up trial balances etc. on the microcomputer.
12.	Availability of 'micro-proficient' staff.
13.	Link-up to client files/computer possible.
14.	Whether client has microcomputer available for auditors' use.
15.	Whether use of microcomputer will enhance client service.

The relative importance of the factors listed above is clearly significantly influenced by the applications for which the microcomputers are being used. For example, the question as to whether the client prepares all the working papers or not (ranked 4th above) would not be an important factor if the auditor was planning to use the microcomputer for audit planning and risk assessment only.

A number of firms indicated by way of additional comment, that engagement partner commitment to the use of microcomputers was an essential factor. Although this factor ranks only 5th above, I believe that it is an extremely important one.

"Firms report a 20:20:60 computer usage pattern among their partners, and staff. Twenty per cent of users think computers are the work of the devil and will have nothing to do with them. Twenty per cent go overboard, embrace the new-found tool enthusiastically, learn to programme it, take it home, dismantle it to see what's inside and so on. The other 60 per cent show good acceptance of the machines as labour-saving devices which are only as useful as the software which drives them' (23).

It is important to use any resource effectively and computer resources are no exception. Auditors should consider factors such as those listed above when deciding where their microcomputers would be most efficiently employed.

7. TRAINING AND STAFF SELECTION

7.1 TRAINING

"Computer training (for auditors) .... is similar to .... learning to fly an aeroplane: both have a slow learning curve followed by a terrific feeling of flying on your own. Electronically saving the spreadsheet is akin to landing without crashing" (16).

Most accountants and members of their staffs have traditionally had little or no experience in the use of computers. This might suggest that training these people is a difficult task. However, in practice, this is not the case and accountants are proving to be keen "computer students". Reasons for this include the following:

- accountants are finding the use of microcomputers stimulating and are highly motivated
- microcomputers are relatively easy to use
- the software being produced is generally quite "user-friendly"
- many audit firms have in their employ one or more skilled computer managers or partners to whom problems may be referred
- a number of accountants have become familiar with the use of computers through having used financial modelling (spreadsheet) packages for the past couple of years

- a number of public courses have been held for accountants on the use of microcomputers and these have been reasonably well attended

- a number of firms have developed good in-office courses.

At a recent conference held in the USA, it was observed that audit firms should spend a minimum of $1 500-$2 000 per person on microcomputer training and that the training should be spread out over a period of six to twelve months for maximum effectiveness.

The firms included in the 1985 survey were asked to detail the training methods employed relating to microcomputers as well as the staff levels being trained. The results are as follows:

1. Methods

Type of training	Number of firms*	% of firms*
In-office courses	20	87%
On-the-job training	20	87%
Self-study	18	78%
Public courses	10	43%
Typing courses	2	9%

(* most firms are using more than one of the above methods).

2. Staff levels being trained

Staff levels	Number of firms	% of firms
Partners	20	87%
Seniors	19	83%
Managers	18	78%
Semi-seniors	18	78%
Juniors	16	70%
Non-professional staff (e.g. typists)	15	65%

The most interesting features of the above are:

- 87% of the firms are conducting their own in-office training courses
- 65% of the firms are training non-professional staff on the use of microcomputers

7.2 STAFF SELECTION

As audit firms are going to be using microcomputers on an ever increasing number of audits, it is clear that audit staff are going to have to become totally familiar with the use of microcomputers. This would seem to indicate that the level of computer knowledge/experience should become a factor to be taken into account when deciding on whether or not to employ a prospective audit staff member.

However, this does not seem to be the practice at present. Only 1 (4,3%) of the 23 firms using microcomputers which responded to the survey questionnaire claim to take this factor into account.

Nevertheless, it is likely that at some stage in the future, the level of computer expertise will become a factor taken into account when deciding on:

- staff recruitment
- staff promotion

This point was addressed at an auditors conference in the USA, where a partner in a Texas firm advised that "when it comes to hire or fire decisions at a firm, the accountant with micro experience will keep his job" (16).

As a result of this, and the rapidly changing technology employed within the auditing profession, I believe that universities should be increasing the amount of training provided on the use of microcomputers as soon as possible, especially within their auditing courses.

8. RECOVERY OF COSTS

One of the major benefits of using microcomputers for audit assistance is the time savings achieved (5 above). This implies that audit fees should be reducing, as fees charged are based on time. However, this is not the case as firms are spending large sums of money on developing software, purchasing microcomputers, training staff etc., and these costs have to be "recovered". There are two ways of achieving such recoveries:

- by charging out the microcomputers in the same way as a staff member (i.e. on an hourly or daily basis)
- by increasing staff charge-out rates, on the basis that the staff members are now more skilled than they used to be.

The firms included in the 1985 survey were asked to describe the techniques they are using in order to recover these costs. The results are as follows:

	Number of firms	%
Costs not being recovered at all	7	30
Recovery via charging out microcomputer in same way as staff member	13	57
Recovery via increasing staff charge-out rates	2	9
Both 2 and 3	1	4
	23	100

I consider that all firms should be recovering their costs and that the 30% not doing so, should change their approach.

The major benefit relating to charging the microcomputer out on an hourly or daily basis is that the microcomputers would only be used where their use will be cost justified. The argument against this form of charge-out is that, in order to achieve many of the benefits described in 5 above, the microcomputers should be used on as many audits and for as many applications as possible.

9. THE FUTURE

9.1 THE TECHNOLOGY

One can only speculate as to future trends in the use of microcomputers for audit assistance. Nevertheless, it is likely that some of the following ideas and concepts will become realities - in fact, some already have.

- "the profession will continue to move slowly but surely toward mass knowledge of this new technology" (16)
- each auditor may carry around his own portable microcomputer, much in the same way as he currently carries around a calculator.
- working paper files will probably no longer exist - all *standard forms, programmes* and schedules may be recorded on disk only - auditing may become "paperless"
- audit partners, each with a computer screen on his desk, may communicate with their staff in the field using their microcomputers, and partners may carry out their reviews of the working papers on the screens.
- data will probably be transferred directly from clients' files onto the auditors' microcomputers
- information required by auditors (e.g. listed share prices) may be obtained via a direct link-up with Beltel or a similar system

- "expert" systems, which use computerised models of human reasoning to solve complex problems the same way a human expert would, will probably be developed for several applications, ultimately having a significant impact on all aspects of an audit practice.

In summary, "the auditor's planning, the field work implementation, the individual microcomputer applications, the individual decision support systems, the audit documentation and the working files will evolve and emerge as fully integrated audit systems. The audit system will be an audit decision support system on a grand scale. It will help the auditor through virtually every step of the audit, providing access to professional literature stored on computer files and helping the auditor make the decisions on risk, controls, audit scope, planning and competent evidential matter. It will capture the decisions of the auditor and document the facts and evidence gathering in computer-readable form. Some will be the working papers! It will provide communications between the audit team members. The partner will review the audit as it progresses by using the microcomputer, and it will even advise the partner when the audit is behind schedule. (The only remaining question is) how far away is the future?" (19).

9.2 OTHER IMPLICATIONS

In addition to the technological advancements referred to above, the accounting literature mentions two other major implications for the profession as a whole. These are:

- "The use of microcomputers provides a valuable opportunity for improving the image and attractiveness of auditing as a career" (21).

- "There will be .... a big shakeout, particularly among smaller practices. *There will be .... a major* migration of their (small firms) clients to larger practices which provide a cost-effective technology-based service. Accountants who adopt the new technology will be *in considerable demand for* the foreseeable future." (13)

10. FUTURE RESEARCH AND CONCLUSIONS

10.1 FUTURE RESEARCH

As mentioned earlier in this report, very little research has been conducted on the use of microcomputers for audit assistance. This report has dealt with a number of aspects relating to the use of microcomputers by auditors, but the scope for future research in this field remains wide. Several areas addressed by this report could be researched further. These areas include the following:

- the working papers and standard audit forms being produced by the microcomputers, with special emphasis on the manner in which firms are obtaining client assistance with the preparation of such papers and forms. Client assistance is generally regarded as essential where working papers are manually prepared.

- the time savings being achieved by the use of microcomputers, with particular reference to the applications which are producing the greatest time savings.

- audit staff motivation and the improved image and attractiveness of auditing as a career generally.

- training aspects, including an assessment of the adequacy of present university education relating to microcomputers for audit assistance.

- the benefits to clients, where their auditors are using microcomputers for audit assistance.

Further research into areas such as those listed above should contribute significantly towards the microcomputer becoming an increasingly more effective audit tool.

10.2 CONCLUSIONS

"This is the beginning of a new era and although technology will make further significant advances, it will be a long time before computers can assist in the judgemental aspects of an auditor's work. However, the time has arrived when portable computers can provide a realistic and cost-beneficial aid to obtaining and manipulating data into a form which will enable the auditor to exercise judgement and form an opinion. The future will see a growth in audit-based software which will make the use of portable computers on audits a necessity rather than just a useful tool" (1).

This report has reviewed and analysed a number of issues relating to the use of microcomputers for audit assistance. The major conclusions which may be drawn from this report are as follows:

- since approximately 1984 (and to a lesser extent prior to 1984) several audit firms have been using microcomputers to assist them with many audit procedures.
- 33% of the South African audit firms which responded to the 1985 survey are using microcomputers for audit assistance on a number of audit engagements.
- microcomputers are being used for most aspects of an audit. Major uses include:
  - the preparation of lead schedules, working trial balances etc. and the posting and recording of adjusting journal entries

  - the drafting of financial statements

  - analytical review procedures

- many benefits are being derived through the use of microcomputers, especially:

  - time savings
  - accuracy
  - improved staff motivation

- hardware and software are relatively inexpensive

- firms not using microcomputers consider that the cost factor and a lack of expertise are the major reasons for their not having implemented microcomputers on audits

- major factors taken into account in determining the audits on which microcomputers will be used are:

  - the number of repetitive and complex calculations required
  - the number of likely adjustments to the year end figures
  - engagement partner commitment to the use of microcomputers

- staff are being trained mostly by means of in-office courses and all levels of staff, including non-professional staff, are receiving training

- costs of computerisation are generally being recovered from clients

"In retrospect it is clear that the new technology has affected every profession business tool we use .... The effect on accountants has been profound and subtle. At one level, only the technology seems to have changed, but these new tools are altering accounting conceptually .... We use more information, process it faster, analyse it and apply it in new ways. Information technology is more than an exciting new way of doing things. It is a new way of thinking, involving a profound cultural change .... As a profession we must adapt to it or reconcile ourselves to becoming as extinct as caption writers for silent movies." (22)

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DEPARTMENT OF ACCOUNTING

RESEARCH QUESTIONNAIRE ON THE USE OF MICROCOMPUTERS FOR AUDIT ASSISTANCE

PREPARED BY : ALAN CHONOWITZ

DATE : SEPTEMBER 1985

NAME OF AUDIT FIRM : _____

NAME OF OFFICTAL : _____

POSITION : _____

PLEASE ANSWER THE QUESTIONS BELOW BY *TICKING THE APPROPRIATE BOXES OR BY* SPECIFYING ANSWERS IN THE SPACES PROVIDED

1. Does your firm utilise microcomputers and related software for audit assistance at all.

   - YES ☐
   - NO ☐

QUESTION 2 IS TO BE COMPLETED ONLY WHERE MICROCOMPUTERS ARE NOT BEING USED FOR AUDIT ASSISTANCE.

2. The reason(s) for not using microcomputers and related software for audit assistance are:

   - these are considered unnecessary ☐
   - the benefits are outweighed by the costs involved ☐
   - lack of awareness of the benefits which may be derived from their use ☐
   - lack of expertise in this area ☐
   - Other reasons (please specify)

     _____

     _____

     _____

QUESTIONS 3 TO 9 ARE TO BE COMPLETED ONLY WHERE MICROCOMPUTERS ARE BEING USED FOR AUDIT ASSISTANCE

3. BACKGROUND INFORMATION	COMMENTS
Name(s) of software package(s)	
Required hardware	
Software developed	
- Locally	
- Overseas	
- By own audit firm or member/associated firm	
- By independent software house	
Approximate cost of software	
Hard disk/floppy disk/either	
Approximate date implemented by firm	
Approximate number/percentage of audits currently using microcomputer assistance	

4. USES OF PACKAGE

FOR WHICH OF THE FOLLOWING AUDIT PROCESSES ARE THE MICROCOMPUTERS BEING USED. (PLEASE INDICATE ONLY THOSE USES TO WHICH THE PACKAGE IS ACTUALLY BEING PUT, AND NOT THOSE WHERE THE FEATURES ARE AVAILABLE ON THE PACKAGE BUT ARE NOT BEING UTILISED)

- Preparation of lead schedules, working trial balances etc.	
- Setting up of subsequent year working papers	
- Drafting financial statements	
- Recording and posting of	
- Adjusting journal entries	
- Reclassifying journal entries	
- Testing effect of journal entries without putting them through	
- Preparation of actual working papers (i.e. not simply a summary of client trial balance)	
- Fixed asset schedules	
- Tax schedules	

- Foreign currency translations	
- Lease amortisation schedules	
- Other (please give examples)	
-	
-	
-	
- Standard audit forms (replacing existing manual forms)	
- Consolidations	
- Analytical review	
- Ratios and statistics	
- Fluctuation (variance) analysis	
- Trend analysis	
- Regression analysis	
- Assessment of audit risk	
- Materiality computations	
- Study and evaluation of internal control	
- Flowchart preparation	
- Sample	
- Design (e.g. based on risk analysis, internal control reliance)	
- Evaluation	
- Preparation of audit programmes	
- Predictive testing (of year-end balances)	
- Recording of work done	
- Testing client computations (e.g. interest, depreciation)	
- Audit certificate control	
- Debtors circularisation	
- Letters	
- Control of replies	
- Evaluation	
- Audit time control/time budgets	
- Memorandum and report writing	
- Tax returns	
- Cash flow analysis (for going concern problems)	
- Obtaining information via Beltel or similar systems (e.g. J.S.E. prices)	
- Communication between	
- Head office auditors and branch auditors	
- Client and auditor	

- Linked to	
- Word processing facility	
- Spread sheet package	
- Graphics (please give examples of uses)	
-	
-	
-	
- Load information directly from client files	
- Other uses (please specify)	
-	
-	
-	
-	
-	

5. BENEFITS OF USING MICROCOMPUTER ASSISTANCE

PLEASE INDICATE ON A SCALE OF 0-5 HOW SIGNIFICANT THE FOLLOWING BENEFITS OF USING MICROCOMPUTERS FOR AUDIT ASSISTANCE ARE CONSIDERED.
(NOTE : 0 = NOT SIGNIFICANT AT ALL,
5 = HIGHLY SIGNIFICANT)

	0	1	2	3	4	5
- Time savings, especially in time-consuming activities						
- Improves audit efficiency						
- Reduces staffing levels and thereby staff costs						
- Enhances profitability						
- Improves staff's E.D.P. knowledge, which results in better computer auditing						
- Improves staff motivation, as						
- Less routine clerical duties						
- Using microcomputer is 'challenging'						
- Increases accuracy of casts, tests, working papers, etc.						
- Results in consistency of						
- Working papers produced						
- Ratios checked						
- Sample sizes computed						

	0	1	2	3	4	5
- Improved documentation						
- Enhances firm's image						
- Allows for more time to 'think' instead of simply checking calculations						
- Improves audit planning						
- Improves audit programmes						
- Provides the ability to do tests which used to be impractical						
- Allows for various alternative approaches to a problem being evaluated						
- Improved time and budget control						
- Other (please specify)						
-						
-						
-						

6. SELECTION OF AUDITS FOR MICROCOMPUTER ASSISTANCE

PLEASE INDICATE ON A SCALE OF 0-5 WHICH OF THE FOLLOWING FACTORS ARE CONSIDERED IMPORTANT IN DECIDING ON WHETHER OR NOT TO USE MICROCOMPUTER ASSISTANCE ON AN AUDIT ENGAGEMENT
(NOTE: 0 = NOT IMPORTANT AT ALL,
5 = VERY IMPORTANT)

	0	1	2	3	4	5
- Whether client prepares all required working papers or not						
- Whether client has microcomputer available for auditors' use						
- Number of likely adjustments to year end figures and time taken to give effect to them						
- Number of repetitive and complex calculations required						
- Deadline vs. non-deadline engagement						
- Client expectations of auditor 'sophistication'						
- Availability of 'micro-proficient' staff						
- Whether a recurring or 'one-off' engagement						
- Working paper formats same each year						
- Audits with audit areas which are 'time consuming'						

	0	1	2	3	4	5
- Likely assistance from client in setting up trial balances etc. on the microcomputer						
- Link-up to client files/computer possible						
- Large number of similar letters/ reports to be produced which require minor editing only						
- Engagement partner commitment to use of microcomputers						
- Other factors (please specify)						
-						
-						
-						

7. STAFF TRAINING

	YES	NO
- *Does staff training on microcomputer* audit assistance comprise:		
- In-office training		
- Attending public courses		
- Attending typing courses		
- Self study		
- On-the-job training		
- *Which levels of staff are being trained on* the use of microcomputers for audit assistance		
- Partners		
- Managers		
- Audit seniors		
- Semi-seniors		
- Juniors		
- Non-professional staff (e.g. typists)		
- Has level of computer knowledge become a factor to be taken into account when recruiting staff		

8. RECOVERY OF COSTS

	YES	NO
Are costs of microcomputer hardware and software being 'recovered'		
If 'yes'		
- Is the recovery by way of charging the microcomputers out in the same way as a staff member.		
- Is the recovery by way of increasing staff charge-out rates.		
- Other methods (please specify)		
-		
-		
-		

9. ADDITIONAL COMMENTS

PLEASE DETAIL BELOW ANY ADDITIONAL COMMENTS *RELATING TO THE USE OF MICROCOMPUTERS IN THE* AUDIT PROCESS WHICH YOU CONSIDER MAY BE OF INTEREST



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