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AUDITING USING MICROTECHNOLOGY

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Author's Biography

FREDERICK GALLEGOS is Manager of the Management Science Group at the Los Angeles Regional Office, General Accounting Office.

Mr. Gallegos has earned an MBA Degree and a BS Degree in Data Processing from the California State Polytechnic University, Pomona. He received his Certified Information Systems Auditor in January 1979, Certificate in Data Education in April 1983, and the GAO Meritorious Service Award in October 1978. Mr. Gallegos has authored and co-authored several books and articles relating to data processing and EDP auditing. He was project leader in the development of an EDP Audit and Controls course for DPMA's model curriculum in Information Systems.

He is currently a Trustee for the EDP Auditors Foundation for EDUCATION and RESEARCH. Mr. Gallegos has taught numerous graduate and undergraduate EDP courses at California State Polytechnic University, Pomona. Also, he has been responsible for the development and implementation of an MSBA program in EDP Auditing at Cal Poly. In 1980, he was selected by the Information Systems Department as its Outstanding Alumnus. Also, he was selected DISTINGUISHED ALUMNUS, for the School of Business for 1982 - CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA, California.

THE MICROCOMPUTER AS AN AUDIT WORKSTATION
Fredrick Gallegos, CISA

With the explosion of micros/personal computers in the work place and their increasing impact on financial accounting systems and management decisions, auditors are challenged to develop methodologies which result in meaningful audit results. Fortunately, the microcomputer can be a valuable tool in developing these methodologies. This session explains how auditors can use microcomputers as a tool in performing their audit function. Examples of applications to be discussed include electronic spreadsheets, data management, graphics and interfacing with other computers (mainframes, micros, minis, personals). Also, the course will consider the steps necessary to prepare organizations for integrating micros into their operating environment.

MICROTECHNOLOGY: WHAT IS IT ?

HOW IS MICROTECHNOLOGY BEING USED TODAY IN THE AUDIT ENVIRONMENT

GAO'S USE OF MICROTECHNOLOGY

CONCLUDING THOUGHTS

MICROCOMPUTER EVOLUTION TIME SCALE

1965 — < 20,000 computers in the world.

1970 — 140,000 computers (with mini's).

1971 — 1st Micro delivered by Intel (4004).

1975 — 1st personal micro delivered (Altair 8800).

1976-77 — more than 12 manufacturers of personal micro

1978 — Radio Shack shipped 105,000 units.

1982 — IBM enters market & sells 175,000 PC's.
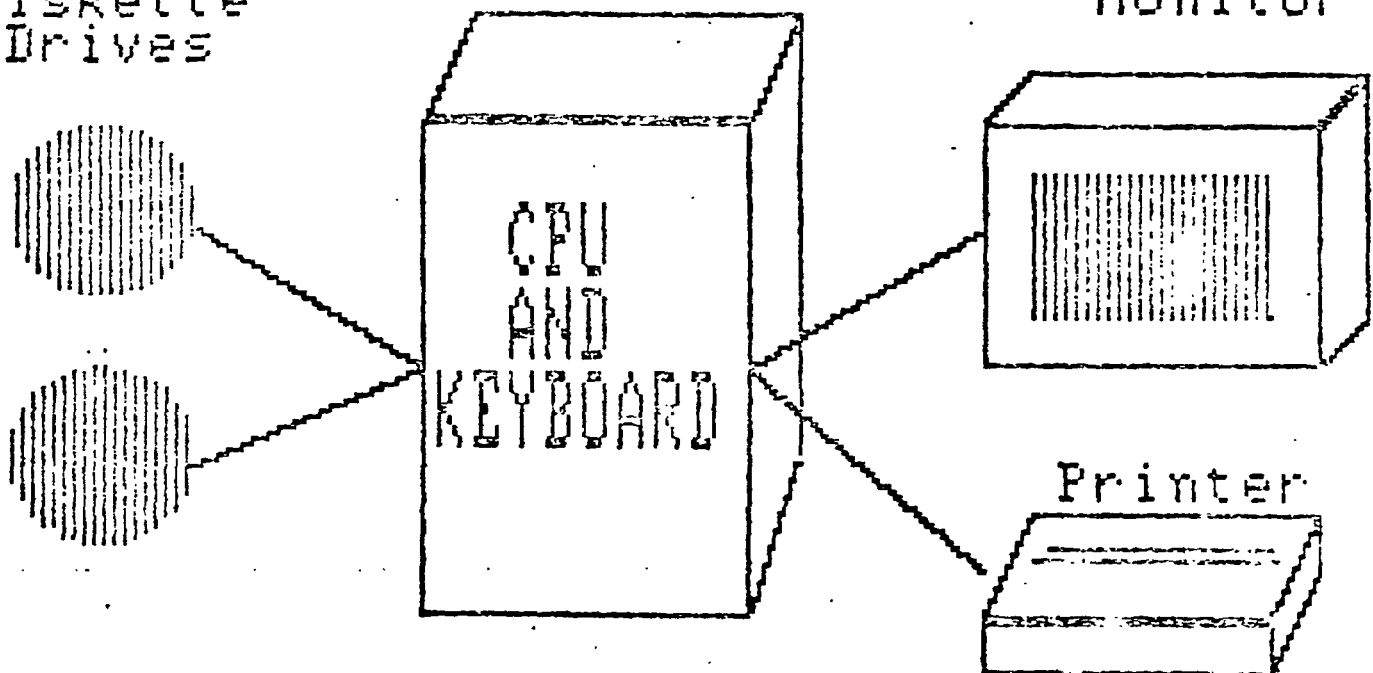
- Apple sells 270,000 units
- Atari 600,000 & TI 530,000

EQUIPMENT

- ■ PROCESSING UNITS
- ■ PRINTERS
- ■ DATA STORAGE DEVICES
- ■ COMMUNICATION PERIPHERALS

EQUIPMENT CONFIGURATION

Diskette Drives

Monitor

CPU AND KEYBOARD

Printer

PROCESSING UNITS

- ▣ APPLE
- ▣ TRS-80
- ▣ IBM PC
- ▣ ALTOS
- ▣ DYNABYTE
- ▣ VECTOR GRAPHICS
- ▣ OSBORNE 1
- ▣ GRID COMPASS

PRINTERS

- ☒ ANADEX
- ☐ SILENTYPE
- ☒ IDS
- ☒ EPSOM
- ☒ NEC
- ☒ DAISYWHEEL

DATA STORAGE UNITS

TYPES OF SOFTWARE

- ELECTRONIC SPREADSHEET
- DATA MANAGEMENT
- WORD PROCESSING
- PROJECT MANAGEMENT
- COMMUNICATIONS
- INTEGRATED

ELECTRONIC
SPREADSHEETS

DYNAMIC SCREENS

VISICALC
VERSACALC
SUPERCALC

STRUCTURED MODELS

DESKTOP/PLAN
DSSF
MICRO FINESSE

NEW WORKSHEET FEATURES

o   Protect Entries
o   Partial Load & Save
o   On-line Help
o   Link Several Worksheets
o   Define cells with labels
o   Advanced Printer Features
o   Boolean Logic (IF, OR, &)
o   Integrate - DBMS & Graphics

DATA MANAGEMENT
SOFTWARE

- DB MASTER
- VISIFILE
- VISIDEX
- GENERAL MGR

- DATA FACTORY
- INFO MASTER
- PFS
- DBASE II

PROJECT MANAGEMENT SOFTWARE

COMMUNICATIONS SOFTWARE

- VISITERM
- DATA CAPTURE 4.0
- ASCII EXPRESS
- ACCESS III
- CROSS.TALK
- OMNITERM

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+-------------------------------------------------+
|                                                 |
|          INTEGRATED    SOFTWARE                 |
|                                                 |
+-------------------------------------------------+
|                                                 |
|                                                 |
|        •   CONTEXT MBA                           |
|                                                 |
|        *   LOTUS 1-2-3                           |
|                                                 |
|        *   VISI-FOUR / ON                       |
|                                                 |
|        *   MULTI SERIES                         |
|                                                 |
|                                                 |
|                                                 |
|                                                 |
|                                                 |
+-------------------------------------------------+
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FIGURE 3

A CASE STUDY

AUDIT AREAS

- PLANNING
- ANALYTICAL PROCEDURES
- WORKPAPER FILING SYSTEM
- NARRATIVES
- FINANCIAL STATEMENTS

ANALYTICAL FUNCTIONS

- ▓ VARIATION ANALYSIS
  - ▪ PERCENTAGE CHANGE
  - ▪ RATIOS
- ▓ TREND ANALYSIS
  - ▪ REGRESSION
  - ▪ BEST LINE OF FIT
- ▓ ACCOUNT ANALYSIS
  - ▪ INTEREST CALCULATIONS
  - ▪ AMORTIZATION SCHEDULES

WORKPAPER FILING

☒ CROSS-REFERENCING
- OFFICE-BINDER CONTROL
- INTRA-BINDER REFERENCING

☐ OPEN-ITEM CONTROL
- SCHEDULES DUE
- CONFIRMATIONS DUE
- TO DO LISTS

NARRATIVES

- INTERNAL CONTROL DESCRIPTIONS
- EXTRACTS
- SUGGESTIONS TO MANAGEMENT
- AUDIT REPORTS
- CONFIRMATION LETTERS

- GSA'S INTERIM REPORT ON THE END USER
  COMPUTER PILOT PROJECT DATED 6/16/83
  END USER COMPUTER SUPPORT GROUP,
  (202)-535-7870

- NBS SPECIAL PUBLICATION 500-102
  MICROCOMPUTERS: A REVIEW OF FEDERAL
  AGENCY EXPERIENCES

- GAO REPORT; SMALL COMPUTERS IN THE FEDERAL
  GOVERNMENT; MANAGEMENT IS NEEDED TO REALIZE
  POTENTIAL AND PREVENT PROBLEMS
  AFMD-83-36

- BUSINESS SYSTEMS UPDATE, A PUBLICATION OF
  PRIMESTAR REARCH, INC; 701 E. IRVING PARK
  RD., ROSELLE, ILL. 60172

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY (ICST) OF THE
US DEPARTMENT OF COMMERCE IS OPERATING AN ELECTRONIC BULLETIN BOARD
SERVICE FOR INFORMATION EXCHANGE ABOUT MICROCOMPUTERS. USERS WITH THE
APPROPRIATE TERMINAL CAPABILITIES (ASCII, 300 baud, 8 DATA BITS, NO
PARITY, 1 STOP BIT) MAY REACH THE BULLETIN BOARD BY DIALING (301)
948-5718.

OPEN 24 HOURS A DAY, SEVEN DAYS A WEEK, ICST ENCOURAGES
USERS TO EXCHANGE MESSAGES, INFORMATION AND IDEAS IN ADDITION TO
PUBLIC DOMAIN SOFTWARE. USERS WILL BE ABLE TO ENTER AND UPDATE
INFORMATION AND TO RECOMMEND ADDITIONAL ENTRIES ON TOPICS SUCH
AS:

*CONFERENCES, SEMINARS, CLASSES, WORKSHOPS
*MAGAZINES, PERIODICALS, AND NEWSLETTERS
*SOURCE BOOKS, DIRECTORIES, INFORMATION SOURCES,
  BIBLIOGRAPHIES
*TELECOMPUTING SERVICES
*USER AND SPECIAL INTEREST GROUPS
*OTHER ELECTRONIC BULLETIN BOARDS
*GOVERNMENT INITIATIVES AND REPORTS
*SKILLS INVENTORIES AND CONTACTS
*PRODUCT AND TECHNOLOGY REVIEWS

IN ADDITION, USERS WILL ALSO BE ABLE TO ACCESS CP/M DRIVEN
PUBLIC DOMAIN SOFTWARE. FOR ADDITIONAL INFORMATION AND/OR ASSISTANCE
PLEASE CONTACT LYNNE ROSENTHAL AT (301) 921-3485

EMAIL read>>

Figure 4

GOALS FOR THE USE OF THE MICROCOMPUTER AS AN AUDIT TOOL

APPLICATIONS	GOALS AND OBJECTIVES
Education Phase:	**Automating the Audit Process**
Client accounting data	Overall audit efficiency
Time and budget data	Automation of time-consuming activities
Trial balances and working papers	
Memo and report generation	Improved time and budget control
Adjusting and updating financial data	Improved documentation
Complete documentation	Reporting efficiency
Drafting final documents	
Familiarization Phase:	**Basic Auditing Functions**
Spreadsheet analysis	Improved basic auditing effectiveness
Designing audit programs	
Simple analytical review procedures	Improved audit programs
	Evidence collection efficiency
Sampling and results analysis	
	Improved evidence analysis
Controls analysis worksheet	
Application Phase:	**Advanced Auditing Functions**
Sophisticated analytical review procedures	Sophisticated computerized functions
Access client files and remote data bases	Improved auditor decision making
	Audit scope enhancement
Generalized audit software functions	
Modeling and decision support functions	Improved EDP audit skills
	Decision support systems
Audit-file collection	Stand-alone collection
Continuous monitoring	Independent audit files

AUDIT TASKS THAT CAN BE PERFORMED
USING MICROCOMPUTERS

--SCHEDULES

      --SETTING UP FORMATS (SPREADSHEETS)

      --PERFORMING CALCULATIONS

      --VERIFYING DATA

      --SUMMARIZING

--MATHEMATICAL CALCULATIONS

--STATISTICAL FUNCTIONS

--WORK PAPER INDEXING AND CROSS-REFERENCING

--REPORT DRAFTS

--TRANSFERRING ALL OR ANY OF THE ABOVE FROM ONE GAO REGION TO ANOTHER OR FROM
AN AUDIT SITE TO GAO.

FIGURE 2

GAO'S USE OF MICROTECHOLOGY

SUPPORT FIELD AUDITOR
NEEDS

* DATA CAPTURING
* WORD PROCESSING
* DATA MANAGEMENT
* STATISTICAL MANIPULATION

SUPPORT REQUIREMENTS
INVOLVING COMPREHENSIVE
ANALYSIS

* MODELING
* UPLOADING TO LARGER
    RESOURCES
* REQUIRES USE OF SPSS, SAS
  OR OTHER ANALYTICAL
  PACKAGE

SUPPORT THE CAPABILITY
TO TRANSFER APPLICATIONS
TO OTHER REGIONS AND
DIVISIONS

* DATA FILES (ASCII)
* APPLICATIONS
    - HIGHER LEVEL LANGUAGE
    - FAMILY SOFTWARE

RESOURCES AVAILABLE

COMPUTER TERMINALS

TI 765 MODEL 40 PORTABLE

- CAPABLE OF HOLDING 200-400 80 CHARACTER LINES OF
  DATA OR TEXT

- BUBBLE MEMORY ALLOWS DATA/TEXT TO BE CAPTURED IN
  A STANDALONE MODE

- CAN TRANSMIT DATA TO A HOST OR MICRO FOR MANIPULATION
  AND RECEIVE RESULTS

MICROS

TWO TRS-80 MODEL III AND ONE TRS-80 MODEL IV

* TELECOMMUNICATION CAPABILITY

* 48K RAM   175K DISK DRIVE (2)   MODEL IV IS 128K

* FAMILY SOFTWARE AND ANALYTICAL SOFTWARE

TWO MICOM 2001 AND ONE MICOM 2001E

* TELECOMMUNICATION CAPABILITY (2)

* 128K RAM AND 64K RAM(2)   545K DISK DRIVES
                                        (2 PER UNIT)
* GENERAL SOFTWARE, CPM AND BASIC

ONE COMPAQ
        * TELECOMMUNICATION CAPABILITY, PC COMPATIBLE
        * PORTABLE, 192K RAM WITH 350K DD DISK DRIVES
        * DBASE II, SUPERCALC, WORDSTAR, CROSSTALK

TIMESHARING

ACCESS TO FOUR TIMESHARING SYSTEMS

IMPACT TO AUDIT STAFF

EDUCATION PROCESS

* TRAINING ON HOW TO USE THE EQUIPMENT
* UNDERSTANDING OF COMPUTER CONCEPTS

FAMILIARIZATION PROCESS

* BECOMING COMFORTABLE WITH EQUIPMENT
* EXPLORING USES
* LEARNING HOW AND WHEN SUCH TECHNOLOGY IS USEFUL
* SELF REALIZATION OF POTENTIAL
* APPROACH TO AUDIT ALTERED

APPLICATION PROCESS

* APPLYING TECHNOLOGY IN AN EFFICENT AND EFFECTIVE MANNER
* DEVELOPMENT OF INNOVATIVE APPROACHES TO PROBLEM SOLVING
* METHODOLOGY ENHANCEMENT

DECISIONS, DECISIONS. . .

WHICH COMPUTER RESOURCE IS RIGHT FOR YOUR JOB?

INFORMATION	EWS	TRS-80,COMPAQ	TIMESHARING
TYPE	numerical and text	numerical and text	numerical
SOURCE	direct data entry agency computers/ tapes other EWS and micros	direct data entry agency computers/ tapes EWS and other micros	direct entry agency computers/ tapes EWS and other micros
VOLUME 1/	up to 2500 cases	up to 10,000 cases	virtually unlimited!
ANALYSIS 1/	arithmetic sorting searching wordprocessing	statistics financial modelling sorting graphics wordprocessing	advanced statistics large scale sort search,count, merge
SOFTWARE AVAILABLE	math sort wordprocessing keystroke memory graphics (simple)	COMPAQ: Supercalc Wordstar dBaseII Crosstalk PC talk TRS-80: Visicalc Superscripsit Profile III plus Statpak	SPSS SAS Dyl-Audit Wylbur

Details and more information with our next issue!!

1/   The volume of data and type of analyses necessary must be looked at
      simultaneously. Neither factor alone can determine the computer and software
      appropriate for use on the job.

LARO LONG-RANGE PLAN FOR INTRODUCING NEW TECHNOLOGY

PHASE I: RECOGNITION
STAFF BECOMES AWARE OF NEW TECHNOLOGY AND ITS IMPACT ON
CURRENT AND FUTURE WORK. STAFF RECOGNIZE HOW TECHNOLOGY
CAN BE USED.

PHASE II: FAMILIARIZATION
EXPAND STAFF UNDERSTANDING OF NEW TECHNOLOGY; DEVELOP
CAPABILITY OF STAFF SO THEY BECOME COMFORTABLE IN
WORKING WITH NEW TECHNOLOGY.

PHASE III: APPLICATION
SELECTED STAFF TRAINED TO USE ADVANCED TECHNOLOGY AND
INNOVATIVE METHODS.

STOP ←— NO — IS DATA DEFINABLE

YES

STOP ←— NO — DOES ANALYSIS INVOLVE
QUANTITATIVE DATA

YES

TASK
MANUAL ←— NO — DOES ANALYSIS REQUIRE SIMILAR
DATA IN SIGNIFICANT QUANTITY

YES

IS DATA COMPUTERIZED — YES →

NO

IS DATA MANUALLY KEPT IN
RETRIEVABLE FORM — YES →

IS
DATA
RELIABLE — YES → TASKS FOR
ANALYSIS

NO
REDEFINE
ANALYSIS

NO
REDEFINE
ANALYSIS