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Conversion to a microcomputer-based accounting system

American Institute of Certified Public Accountants. Computer Applications Subcommittee

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MANAGEMENT
ADVISORY SERVICES
PRACTICE AIDS

TECHNICAL CONSULTING PRACTICE AID

11

***Conversion to a
Microcomputer-Based
Accounting System***

AICPA

American Institute of Certified Public Accountants

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MAS practice aids are designed as educational and reference material for the members of the Institute and others interested in the subject. They do not establish standards or preferred practices. The standards for MAS practice aids are set forth in the Statements on Standards for Management Advisory Services (SSMASs) issued by the AICPA. However, since the services described in this series of practice aids are management advisory services, the standards in the SSMASs should be applied to them, as appropriate.

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***Conversion to a
Microcomputer-Based
Accounting System***

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Preface

This MAS practice aid is one in a series intended to assist practitioners in applying their knowledge of organizational functions and technical disciplines in the course of providing management advisory services. An AICPA study has subdivided such knowledge into seven areas: executive planning, implementation, and control; finance and accounting; electronic data processing; operations (manufacturing and clerical); human resources; marketing; and management science. Although these practice aids will often deal with aspects of those seven areas in the context of an MAS engagement, they are also intended to be useful to practitioners who provide advice on the same subjects in the form of an MAS consultation. MAS engagements and consultations are defined in Statement on Standards for Management Advisory Services No. 1, issued by the AICPA.

This series of MAS practice aids should be particularly helpful to practitioners who use the technical expertise of others while remaining responsible for the work performed. For members employed in industry and government, MAS technical consulting practice aids contain information that may be useful in providing internal advice and assistance to management.

MAS technical consulting practice aids do not purport to include everything practitioners need to know or do to undertake a specific type of service. Furthermore, engagement circumstances differ, and, therefore, practitioners' professional judgment may cause them to conclude that an approach described in a particular practice aid is not appropriate.

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Scope of This Practice Aid

This practice aid describes the process of converting a small business client's manual accounting methods to a microcomputer-based system. The engagement may be as fully detailed as a conversion for a larger client. It is directed toward a computer-literate audience, including systems specialists. Most of the procedures are also applicable to conversions from an existing microcomputer system to a new one. If the client has already acquired the computer system and applications packages, some of the evaluation steps may not be applicable. However, determining whether the existing system meets the client's accounting objectives can be as important as conversion.

The typical microcomputer installation resulting from this kind of small business engagement consists of one or more central processing units, printers, and monitors as well as other hardware. In addition to accounting, the business uses the computer system for other applications, such as word processing. The owners of the business and their employees, rather than data processing specialists, use the computer(s), and they may have no prior computing experience.

This practice aid divides client assistance into two separate engagements. Engagement 1 begins by evaluating the current system and ends by recommending a specific software and hardware combination. Engagement 2 discusses the actual conversion to the automated system. However, some practitioners may elect to perform the conversion assistance in a single two-phased engagement.

The Appendix includes sample engagement letters for both engagements. The sample checklists and work plans, if used by a knowledgeable project leader, can serve as the basis for evaluating a business's accounting systems needs and selecting an automated system to perform the required functions.

This practice aid is not intended to provide guidance for implementing critical operational (nonaccounting) systems, dealing with the needs of large or complex systems requiring local area networks or multiuser capability, or evaluating minicomputer or mainframe applications. Likewise, the practice aid omits discussion of program development, which requires other kinds of approaches, methods, and practitioner skills. Refer to other AICPA publications for that information.

Engagement 1: Evaluating the System and Selecting Software and Hardware

Define the Objectives

The most important task of any system conversion is defining objectives. The definition process typically begins at the initial meeting of practitioner and client,

when they discuss how the microcomputer system can benefit the client and whether installing the system is feasible. At that time, client management expresses its objectives and expectations about what the computer-based accounting system can do for its business.

Understanding and formalizing the client's expectations of what the microcomputer system can do is very important, because many computer novices have unrealistically high expectations that cannot be met economically. A small business client with a manual accounting system may not have the staff or expertise required to realistically plan the conversion. The practitioner helps the client define the objectives of the conversion and describe what results the business can realistically expect.

Rather than attempting to cover all the possible applications and benefits, the practitioner can use this meeting most profitably by focusing on the primary issues or problems facing the business, such as—

- Late and inaccurate monthly financial statements.
- Accounts receivable collection problems.
- Difficulty in meeting shipping commitments.
- Frequent inventory stockouts.

Detailed fact gathering in one or more of the specific problem areas will occur later as part of the engagement. The discussion in the initial meeting can guide the practitioner in preparing the engagement letter and tempering the client's expectations. General information discussed at this meeting may include—

- What data the system can accumulate.
- What reports the system can produce.
- The relative importance and cost of each system element.
- Implementation time frames.
- The possible impact of major system changes on client personnel.

The initial meeting is also a good time for both the practitioner and the client to discuss the importance of first selecting the software and then the compatible hardware. This discussion may be particularly helpful if the client has previously purchased a computer that does not fully support the proposed applications and will require upgrades or additional peripherals, such as hard disks and faster printers.

Establish a Budget

A well-drawn budget clearly reflects the full cost of the conversion and the time required to effectively and efficiently install the system. The practitioner can help the client determine what level of financial commitment will be necessary to execute the entire project: funds are necessary not only for buying and maintaining software and hardware but also for training users, hiring temporary help for master file conversion, and retaining consultant assistance.

It is particularly important that the client recognize the value-added nature of the practitioner's service. If not, the client may compare consulting fees with the cost of hardware and software and feel that the consulting fees are inappropriate. These noncapital expenses can be equal to or greater than the investment in hardware and software, but they are as crucial to the long-term success of the installation as the capital expenses.

Reach an Engagement Understanding

The formal understanding reached at the initial meeting between the practitioner and client will be documented in an engagement letter. The client needs to understand that commitment and participation are necessary for a successful engagement. Exhibit 1 is a sample engagement letter¹ that includes information on the engagement's objectives, benefits, staffing, scheduling, and fees.²

Develop an Engagement Work Plan

Using the engagement understanding reached with the client, the practitioner prepares a detailed engagement work plan for the client's approval. The plan defines the steps in the conversion process, outlines the schedule, and assigns specific responsibility for each task. Exhibit 2 is a sample work plan for evaluating the existing system and selecting software and hardware.

Evaluate the Existing Manual Accounting System

The first step in analyzing the feasibility of a microcomputer system is evaluating the existing manual system and determining which accounting applications may be candidates for conversion, which may be processed by a service bureau, and which may remain as manual tasks.³

Exhibit 3 provides a checklist for identifying key accounting system functions. Exhibits 4.1 through 4.4 contain individual checklists for several common accounting applications; they will help document the existing system and estimate the extent of the conversion. (If the conversion proceeds in stages, it is important to integrate later additions with what has already been automated. Correction of obsolete or inefficient manual functions can take place either before or during the conversion process.)

The evaluation process breaks down into two steps: fact gathering and cost-benefit analysis.

1. All exhibits appear in the Appendix.

2. Refer to Statement on Standards for Management Advisory Services No. 2, *MAS Engagements* (New York: AICPA, 1982), for additional information on MAS engagement understandings.

3. Additional guidance in the review and analysis of business information systems can be found in MAS Small Business Consulting Practice Aid No. 9, *Diagnosing Management Information Problems* (New York: AICPA, 1986).

Fact Gathering

Adequately documenting the client's current business procedures aids in selecting appropriate software applications. The immediate objectives of fact gathering are to obtain—

- A system description sufficient to understand the client's operations.
- Transaction volumes for use in evaluating software and hardware capacity.
- Sample forms used in the client's manual system.
- Costs data for the existing system in order to estimate the projected savings that may result from the conversion.

With an understanding of the client's business, the practitioner can determine which accounting areas lend themselves to automation. Prime candidates for conversion are those with the following characteristics:

- High clerical involvement or labor cost
- Repetitious tasks or a large number of time-consuming tasks
- Mathematically complex calculations
- Record keeping that requires a high degree of accuracy
- Processing that requires timely provision of information
- Need for timely production of management reports
- Processing exceptions based on objective criteria

For example, in the present system one clerk may spend two hours per week processing the client's payroll through a service bureau that provides sufficient and timely reports for management and accounting purposes. Changes in the essential data elements are few but require subjective judgment. Although payroll may be a candidate for conversion to an in-house system, the changeover may not be cost effective.

In contrast, inventory control may require three full-time clerks to post receiving and shipping reports, update inventory costs and stock levels, and determine stock reorder quantities. To determine accurate values of inventory under FIFO, LIFO, and weighted-average cost methods, these clerks perform repetitive mathematical tasks. Thus, stock levels may not be readily and accurately determined. A computerized system, however, can provide accurate, timely information and thus reduce stockouts, prevent unnecessary reorders, and reduce inventory levels in general.

Installing a computer will not by itself resolve manual-system problems. In fact, if the causes of current problems include insufficient accounting experience among the client's staff, adding a new system may well exacerbate the problem. Properly trained and effective personnel are essential for successful systems operation.

The practitioner can assist client management in evaluating the qualifications of personnel with regard to—

- Familiarity with accounting concepts in general.

- Knowledge of their specific jobs.
- Willingness to cooperate in improving the overall accounting system.
- Degree of constructive suggestions to improve the system, whether manual or computerized.
- Experience and education in computer operations.
- Adaptability and willingness to make procedural and system changes.

The result of this evaluation will indicate whether the experience and training of client personnel can meet the requirements of the new system. By discussing personnel considerations and observations with the client, the practitioner will know if personnel changes or additional training are appropriate.

Cost-Benefit Analysis

Once fact gathering is complete, the practitioner evaluates the costs and benefits of each accounting application, bearing in mind that costs are concrete whereas benefits are often intangible. Exhibit 5 is a sample preliminary cost analysis worksheet.

How much will the financial performance of the business improve? This is a major consideration in estimating the benefits of a computer system. For example, if the client's current accounts receivable turnover rate is eight times per year, what savings may result if that rate rises to nine times? Again, if sales increase at a rate of 12 percent per year, how will the increase affect cash flow in three years?

It is prudent to anticipate and plan for an increase in the client's software and hardware costs during the three-year period immediately following the engagement, because new technology may dictate replacing the software, the hardware, or both. Protection against obsolescence is justified even though the planned hardware and software may continue to perform satisfactorily at anticipated future volumes.

Evaluate Nonaccounting Operations

Other computer applications, such as word processing, database management, and spreadsheet programs, are useful not only in the accounting function, but also in meeting overall business needs. Hardware suitable for accounting applications will usually run these nonaccounting applications with the addition of appropriate software. However, some accounting programs cannot transfer data to nonaccounting software.

The practitioner needs to determine what role other generic applications will play in the accounting function. For example, if customer-invoicing volume is low, should the client consider using a word processor in lieu of an automated billing system? If other packages are either currently in use or planned, the practitioner and client need to consider their specific hardware requirements to avoid incompatibility and additional future costs.

Prepare a Needs Evaluation Report

The practitioner summarizes the evaluation process in a report to the client that prioritizes needs, describes recommended applications, and proposes a range of solutions, often organized by application. The practitioner also notes any change in the planned work program that results from the evaluation. (Exhibit 6 is a sample report.)

The needs analysis report also addresses the results of the cost-benefit analysis, defines potential productivity and profitability improvements, and provides the basis for selecting the recommended software. The client acknowledges and approves the facts in the report.

Select Software

Using the client-approved needs list in the report, the practitioner evaluates the appropriateness of specific software. Software can be general purpose, custom written, or industry specific (that is, *vertical*—prepared for specific clients, such as doctors, automobile dealers, or real estate agents).

It is unlikely that the cost of a custom-written accounting application can be justified for a microcomputer. However, many vendors make source codes available to customize their general-purpose software for unique situations. With care and appropriate technical skills, minor customization of such packages can result in a better solution for the client. Industry-specific software is frequently packaged with compatible hardware by turnkey software houses or hardware manufacturers.

Another consideration in selecting software is its availability in a noncopy-protected form. Copy-protected software generally limits the number of times the software may be copied, or it requires that an original copy be present in a floppy-disk drive to operate the software. Situations such as hardware failure, disk upgrading, or even operator error may necessitate making an additional copy. If the user needs to obtain a new program disk from the vendor to effect such a change, a costly delay may occur.

The software selection process can easily consume an inordinate amount of time and money because of the number and similarity of software packages available. Therefore, it may be preferable to limit the search and evaluation process to the apparent top two or three applicable packages (determined by personal experience, dealer recommendations, and user comments). Many experienced practitioners repeatedly recommend and implement one or two product lines of accounting applications for their clients, unless these preferred systems clearly will not handle the client's requirements. By having extensive experience with a particular system, the practitioner can realize substantial cost savings in all aspects of conversion assistance engagements.

Automated Software Selection Programs

Microcomputer software packages (such as Sherry Tate's Matchware and Computer Training Service Inc.'s Guide to Accounting Software for Microcomputers)

are commercially available to evaluate other software applications. They work by matching individual needs with program features and producing a report that ranks each software package according to its ability to meet those needs. The programs cover nearly all possible features offered by the various application programs and thus reduce the possibility of overlooking an important feature. However, the practitioner and client need to carefully review automated application selection reports for accuracy in light of the client's specific needs. These packages do not evaluate subjective considerations, such as ease of use, availability of qualified installers, quality of documentation, vendor support, or requirements for unique forms. Aided by the practitioner's professional experience and guidance, the client needs to evaluate these factors separately.

Review of Sales Literature and Articles in Periodicals

Other methods of determining how a particular package will meet the client's software needs are to review the sales literature for several vendors' packages and to study the client's current system and management reports. The practitioner and at least one client representative can work together in listing software applications that meet specific needs, based on the client's requirements and desired functions.

Articles in computer magazines evaluate accounting software programs and can be a source of important information on such factors as ease of installation and use, ability to handle errors and create audit trails, and versatility. (The Bibliography at the end of this practice aid contains a list of computer magazines.) However, the client may have specific requirements that the articles do not consider or the terminology in the articles may not match the client's industry or specific usage.

Vendor Demonstrations

After carefully reviewing the software programs of various vendors, the practitioner and client may narrow their choices to a few vendors. At this point they may request a vendor demonstration to see the system operate and determine the vendor's product knowledge.

It is generally not economical to prepare a formal request for proposals (RFP) for microcomputer accounting applications, nor will most microcomputer vendors respond to RFPs, except in very large multiple-copy sales situations. Rather, it is usually appropriate for the client and practitioner to visit dealer offices for a demonstration. The demonstrations are most beneficial when the practitioner advises the vendor about the client's needs and concerns. This permits the vendor to "customize" the demonstration.

General operations of the software, security procedures, and a demonstration of the specific features the client requires are possible agenda items for the demonstration. A vendor evaluation checklist, such as exhibit 7, is helpful. As part of the evaluation, the practitioner obtains the names of other users from the vendor and contacts them or has the client contact them, paying particular

attention to the users' hardware configurations, operating systems, and similarity to the client's business environment. The practitioner may also ask the vendor to provide financial references.

During demonstrations, the practitioner can examine the software in great detail to make sure it satisfies the client's needs, particularly those that are critical or unique to the business. For example, does the payroll module support piecework? Can an employee work both hourly and on a piecework basis? Are commissions based on salesperson, product, or both?

Balancing and Controls

Balancing and control features are critical to maintain automated systems. However, vendors and dealers often overlook these features in documentation and demonstrations. The practitioner needs to determine that the software provides proper system controls and the capability of balancing master files, input data, and financial statements.

Documentation

Well-organized, professionally prepared documentation is an important feature of all software packages. The client and practitioner need to review a vendor's software program documentation. They will frequently refer to the software documentation, especially during the implementation phase. Exhibit 8 covers evaluating the documentation, the vendor's or manufacturer's warranty, and special features.

Select Hardware

After selecting software, the client and practitioner work together to select hardware that can run the software. The following factors and hardware performance characteristics may become important:

- Manufacturer support
- Ease of equipment operation
- Ease of use of the system software utilities
- Compatibility with other microcomputers
- Reliability of the hardware, hardware vendor, and manufacturer
- Environmental considerations (heat, noise, and electrical requirements)
- Adaptability to peripherals such as printers, modems, and monitors
- Ability to link up with other manufacturers' systems through local area networks or other means
- Availability of other programs
- Availability and cost of servicing, if needed
- Ability to expand to multiuser version
- Hardware cost

It is of the utmost importance that the client select a system fully capable of accepting data input, processing it, and generating the required output within a reasonable length of time. The practitioner needs to verify these capabilities during both the demonstration and the reference-checking process. Exhibit 9 provides a useful checklist for identifying hardware requirements.

The microcomputer's data storage capacity should allow for appropriate growth. (Most software vendors have checklists and forms to determine file storage requirements for accounting applications. The initial cost of purchasing a system with expandable storage and processing capacity will be considerably lower than upgrading later.) It is strongly recommended that a hard-disk system be used with accounting applications, even in the smallest installations. The hard disk offers numerous advantages, including increased processing speed, ease of use (no disk swapping), and improved data protection.

Prepare a Summary Report of Software and Hardware Recommendations

After completing the software and hardware evaluation, the practitioner may prepare a formal report for client approval, including selection criteria, a list of the software applications and hardware configurations selected, and reasons for the selections. This summary report will help to eliminate future misunderstandings between client and practitioner about these decisions. A sample summary report of software and hardware recommendations is included in this practice aid as exhibit 10.

Engagement 2: Implementing the Automated System

After the client has decided to install a system, the practitioner may propose a follow-up engagement to assist in implementing the system.

Establish an Engagement Understanding

To start off, the practitioner establishes, and documents in a formal engagement letter, an understanding with the client about the practitioner's role in the system's implementation. Exhibit 11 is a sample engagement letter.

The practitioner needs to advise the client that many factors—some controllable, others not—influence the ultimate success of the system implementation. Examples of controllable factors are—

- Preparation of coding schemes.
- Sizing and inputting of initial data.
- Training of client personnel.

Examples of noncontrollable factors are—

- Degree of client management support.
- Reliability of hardware.
- Quality of software selected.
- Responsiveness of hardware and software vendors to problems that may arise with their products.
- Attitudes and capabilities of client personnel who are responsible for operating the system.

One of the goals of the engagement is to minimize the potential impact of the uncontrollable factors through a process of systematic evaluation and implementation.

Identify Practitioner, Vendor, and Client Responsibilities

A successful system implementation engagement requires that all parties know their responsibilities. An implementation work plan, such as the one illustrated in exhibit 12, lists specific tasks that the practitioner, vendor(s), and client need to complete. The practitioner prepares the work plan, describing each task in sufficient detail so that the person who will perform it clearly understands what to do. The practitioner also maintains separate plans for each individual participating in the implementation. The client normally approves the work plans and then reviews them with the vendor to secure agreement.

Determine a Schedule for Completion of Each Task

After developing the work plan and defining responsibilities, the practitioner schedules completion dates for every task in the plan in order to effectively control the installation. These dates need to be realistic and allow for interruptions, if necessary.

During installation, the practitioner communicates and coordinates the schedule with all parties. Frequent meetings are needed to review progress, discuss problems, and make adjustments in the work plan. If necessary, the practitioner distributes an amended work plan showing revised start and finish dates promptly after each meeting, with the client's acknowledging and agreeing to any changes.

Develop Coding Systems

The coding system affects the quality and usefulness of the information the computer system produces. Virtually every accounting system depends on a coding system, which comprises general ledger account numbers, department or division designations, salesperson numbers, sales tax codes, payroll deduction codes, customer types, and so on. These codes control report formatting, calculations, running totals in quantities and dollars, and other facets of a client's business.

Whoever prepares these codes needs to carefully consider the desired reporting and sorting sequences. One of the most significant benefits of an automated system can be management reporting, and many microcomputer accounting packages have powerful report writers that provide reporting flexibility. The practitioner can facilitate implementation by anticipating future reporting requirements and planning for the collection and organization of the data through proper input coding. Coding structures require documentation and will be especially important if other accounting applications are installed in the future.

For example, the general ledger program may require specific ranges of account numbers to differentiate the client's assets, liabilities, equity, income, and expenses. These ranges may or may not match the client's existing account coding. Changing the client's manual chart-of-accounts coding may enable the general ledger system to produce more useful reports.

For accounts receivable or accounts payable applications, the client and practitioner may wish to assign numbers to customers and vendors in alphabetical order. If so, the assigned numbers should have large gaps between them so that new customers or vendors can be added. Alphabetization aids (for numbering data fields) can simplify this task. And embedding a Standard Industry Code number within the customer or vendor number can serve marketing purposes.

Many computer applications require defining and entering certain codes in a specific sequence. For example, the computer operator may need to define all valid salesperson numbers before entering customer data that includes the salesperson number.

With manual methods, input documents (such as sales invoices and journal entries) and most master file records (such as those for employees, customers, and vendors) often do contain numeric or other standard coding. To facilitate coding for conversion, input, and possibly output, documents may require redesign. The client's or practitioner's staff needs to do this as soon as they establish codes so that new forms can be printed and available when the system is operational.

Install Hardware

Delays in delivery, environmental factors, technical problems, and unplanned events can hamper the physical installation of any computer hardware, even the least complex microcomputer. For example, installing a microcomputer in an overheated room or on unstable furniture can be uncomfortable for the operator and harmful to the equipment itself. The computer work area needs good, glare-free lighting, adequate AC (alternating current) power supply, and reliable air-conditioning and heating facilities. Telephone-line access is necessary if the new system includes communications applications. (Telephone lines that bypass PBX installations may be necessary for some applications.) All the equipment needs power surge protectors because power fluctuations can not

only hamper operations but also seriously damage hardware components. In winter or in dry climates, static electricity can cause a major problem. It can be overcome by using static-arresting pads, grounding the hardware, or placing a humidifier in the work space.

Standard office desks or worktables are generally not adequate for comfortable, efficient operation of computers. The keyboard area needs to be lower than the height of standard desk tops, for the same reason that secretarial desks have a lower surface on which to set a typewriter. Each workstation needs space (and possibly an adjustable copyholder) for documents containing input data. Furniture manufacturers and specialty office equipment companies provide a large array of convenience items, such as slide-out keyboard drawers, swiveling monitor stands, central processing unit (CPU) tabletops and stands, diskette storage cabinets, and the like. Most computer stores also offer various items that can make the work space efficient and comfortable.

Stock supplies, such as diskettes, printout paper, and printer ribbons, are generally available from office supply and even discount stores. However, special forms (for example, bank check stock and invoices, preprinted labels, and letterhead stationery and envelopes) may take four to six weeks to print and therefore should be ordered in advance to insure their availability when the system is first operational.

Establish Security Procedures

Passwords and Physical Locks

Documenting and consistently using security measures can prevent data loss and unauthorized access to confidential material. Some good security measures include the following:

- Passwords for computer access
- Physical locks
- Procedures for backup and recovery of data
- A contingency plan to replace a system quickly in case of hardware failure
- Storage of system diskettes in a locked container
- An amended insurance policy to provide for loss contingencies, such as business interruptions

The client should select passwords randomly, using several different methods and avoiding obvious codes, such as social security numbers, last names, operator birth dates, or relatives' names. A list of passwords and the names of those to whom the passwords are assigned need to be stored in a safe deposit box or other off-premises location for future reference. Backup of password files and revision of off-site copies are necessary each time a password is changed.

A small business in which one person normally controls an entire application (if not the entire accounting system) requires provisions for obtaining access to data in the event of that person's sudden, unexpected absence (because of, say, a major accident). The client needs to continue operating the business, collecting receivables, paying employees and trade vendors, and so on. Therefore, an off-site written record of necessary codes and passwords is a critical necessity.

Backup Recovery Systems

An effective disk- or tape-based backup and recovery system is essential to avoid a potentially catastrophic loss of data. The client needs to regularly back up programs and data files, maintaining copies of all files at a secure off-site location for use in case the on-site files and backup copies are destroyed.

The client also needs the off-site location to maintain copies of other data essential to the operation of the organization, such as system documentation. In addition, printed reports of recent balances, customer lists, inventory information, and the like are stored in the off-site location. If the client restores computer files from backup copies, he can use totals and other data from printed reports to verify that the restored data is correct.

An automated accounting system requires sophisticated backup procedures. Maintaining three generations of backup copies for all files ensures the client's ability to recover as much data as possible, even if the most recent backup copy is "corrupt." Ideally, each separate accounting module in an integrated system (for example, general ledger or accounts receivable) will have a separate backup. Floppy disks and streaming tape are efficient and cost-effective backup media, and the choice between them depends on the volume of data.

The computer operators can maintain logs showing which files were backed up, the operator's name, and the date and time of the backup. (The backup medium itself should indicate the files it contains, the accounting date through which the processing has been completed, and the date of the backup.) If possible, the log entry indicates or summarizes the day's work performed, in case the backup or restoration is unsuccessful and reentry of the data is necessary. Exhibit 13 is a sample backup log.

An important and often overlooked element of an effective backup procedure is recovery. When errors are detected—such as lost data or corrupt files—the backup copy will be useless if no one knows how to restore the data to the system. Therefore, users need to know how to read the logs to determine which backup media to use, how to read the media labels to be sure of selecting the correct backups, and how to carry out the procedures correctly to restore the data.

Restoring the files of an integrated accounting system may be more complicated than restoring a single application. For instance, it is necessary to determine whether to restore an application's data files to the original date.

Detailed written procedures explaining these concepts are essential because the procedures are rarely used. Outside help may be necessary to assist with extensive recovery operations.

To be sure that operators understand the detailed procedures for backup and recovery, the practitioner may decide, with client approval, to simulate a failure to catch the client personnel off guard and observe how they handle a "crisis" situation. Since vendor-supplied backup procedures are usually incomplete or incorrect, conducting a trial run can save many hours of trouble if a real problem occurs later on. Users can also learn valuable lessons by removing a set of data files (and possibly the system files) and reloading the system from the backups.

Monitoring Procedures

Specific facts about an operation are difficult to remember, so most computer systems have manual monitoring procedures. These provide information about system capacity utilization, scheduling conflicts, and response time of hardware and software vendor support, and they can also identify and resolve certain problems.

Monitoring activities may include recording all computer activity in a log similar to the one in exhibit 14. Users who experience a problem with any aspect of the computer system record the problem in a report for future reference and management review. For an example of a problem report, see exhibit 15.

Install the Application Software

Installation procedures for accounting software applications include the following basic steps:

- Read the installation instructions in the software documentation.
- Determine the specific location (directory reference) of programs and data files on the disk.
- Copy all application programs to their respective locations. This may require using the vendor's installation procedures rather than a simple "copy" operation.
- Set any optional parameters such as printer selection or paper size.
- Create all data files on the basis of sizing requirements decided by the client.

Additional installation steps may be necessary. For example, most operating systems provide special utilities for testing disk surfaces to confirm their integrity. After installing the application software, another step is to compare a printed list of all programs on the disk to the vendor's list of the software provided in order to verify that the installation is complete and accurate.

Supervise Creation of Data Files and Master Files

Computer systems may have as many as three major types of files—for example, control, special code, and history files—that require data before an operator can enter current balances. Planning and documentation of this initial data entry are essential.

Control files, such as company files that contain continually updated information about the organization, are normally entered first. They need to be selected carefully because inadequate control files can significantly impact the application's effectiveness.

Special code files contain allowable values for entries into the system—for example, tax codes, salesperson numbers, terms-of-sale codes, and shipping method codes. Again, careful thought is necessary in setting up special codes for a client.

History files contain financial information from prior periods. These files provide the basis for developing comparative financial reports, such as balance sheets and income statements. Historical data is particularly important for monitoring company performance and budgeting.

Master files may contain common information about customers, vendors, general ledger accounts, or inventory items. Software manuals often include forms for collecting the required information. Master file data may be entered in stages, but the general ledger files will usually be set up all at once.

Establish Controls for Data Input

Control of data input is essential to produce accurate and complete computer files. The controls, which can include document counts, item counts, dollar totals, batch totals, and hash totals, are suitable for monitoring the input of both start-up information and daily operations. If input is accurate, the previously established control values will correspond with the computer-generated output. Maintaining a daily log to verify key accounts, such as cash, accounts receivable, and accounts payable balances, is also useful.

The practitioner may assist the client in developing checklists that define the steps in daily processing, including the calculation of appropriate control totals. Exhibit 16 is a sample daily processing checklist for accounts receivable.

If the volume of data input requires use of temporary help, the practitioner may suggest that the client let the temporary personnel maintain the old system so as to free client personnel to work with the new system. If temporary workers build the new system, their knowledge and training will be lost to the client when they leave.

Verify Initial Balances

After entering the start-up data into the system, the practitioner verifies the entries by comparing the report totals and client information in the manual

system with the computer-generated reports and data. To gain familiarity with, say, the computerized accounts receivable system, the client may enter and process data for a few customers and compare the results with similar data in the old system—a practice known as parallel processing—until the results obtained with the computerized system are satisfactory. In many instances, however, parallel processing is impractical because the client does not have sufficient staff to operate both systems. Furthermore, parallel processing can be time consuming and costly. In any case, parallel processing is not a substitute for adequate controls, balancing procedures, and proper verification of reports.

Since the transition from a manual to a microcomputer-based system is usually difficult, the practitioner naturally tailors the conversion to the client's operating environment and technical skills. It is seldom advisable to abruptly terminate an existing manual system and depend entirely on a relatively untried and unfamiliar new system. Therefore, the expense of parallel processing may be justified if its use helps the client avoid impairing business operations because of conversion problems.

Conduct Training Courses

The goal of training is to make the client's staff thoroughly familiar with every aspect of the tasks they will perform when using the operating system, application software, and hardware. Before creating master files, the operators need to know the daily, weekly, monthly, and annual processes for which they will be responsible.

Initial Training

The operators receive hands-on experience in running the system with test data before working with live data. Initial training may use independent study, one-on-one instruction, or group teaching. Many dealers and vendors offer training or computer-assisted training aids, including demonstration data. In some areas, community colleges and other private and public educational institutions offer training in scheduled classes or in customized formats. The many options vary greatly in cost and effectiveness, so careful consideration of the operators' skills and previous experience is important in selecting the proper method of instruction.

Client personnel should input historical and other master file data. This activity provides an excellent opportunity to use the software menu system, understand cursor movement, and become knowledgeable about the software's editing and error-correction functions. In addition, personnel become familiar with the contents of the system's master and data files.

Continuing Training

Although the initial training may be adequate for installation tasks, it may not include all the procedures operators need to know to work on a complete

accounting system. Additional training shortly after installation is complete alerts users to the new system's options and features. In planning for such training, the practitioner considers the capabilities of the client's staff, the amount of time required, the location of suitable facilities, and the cost.

Plans for training new staff are also necessary. The client's staff may be skilled enough to train new users in-house. However, if a key employee leaves, the practitioner or vendor may need to train the employee's successor.

Establish Requirements for Document Storage and Retention

The practitioner and client plan for the storage and retention of important data, including output reports, source documents, and backup disks or tapes. The plan includes documenting procedures and locations for storing and retaining files. In addition, operators need to learn specific storage tasks and understand the importance of those operations in a well-functioning system.

Conclude the Engagement

After completing implementation, the practitioner meets with the client to discuss the conclusion of the engagement. They acknowledge completion of the specific steps of the engagement by signing off on each one. The practitioner advises the client that additional services will be billed separately and may follow up with a letter confirming the conclusion of the engagement and the terms for any additional services.

Periodic Reviews

Periodic meetings make it possible to realistically evaluate the new system by reviewing its progress, reassessing the capability of the software and hardware, and evaluating the performance of the people who run the system. Such meetings are particularly helpful if a client retains unrealistic expectations about the automated system and underestimates the effort required to make the system function effectively.

Management's information requirements may also change over time and the system may need modification or enhancement. Clients may also have reservations about their newly installed computer systems, even though the systems are producing the results desired. They may hear about new or revised applications or read advertisements on equipment with features that appear to produce greater results at a lower cost than their systems. By anticipating these concerns and helping the client determine whether and what enhancements to introduce, the practitioner can promote long-term client satisfaction.

Ongoing Support

Many other opportunities for additional service to the client exist as an outgrowth of a successfully implemented microcomputer installation. A success in one or a few applications usually leads to automation of additional functions;

success in providing better, more timely management information often leads to engagements for higher-level management assistance, analysis, projections, and planning.

In addition, errors and problems will, of course, arise from time to time in any system. Some practitioners plan for timely assistance to clients in emergency situations by installing modems and communications software on the client's system during the initial conversion. This can allow remote operation and debugging of client problems from the practitioner's office.

Conclusion

Few activities produce as much anxiety for business owners and managers as conversion from a manual to an automated accounting system. Practitioners can reduce this anxiety by assuring their clients that with proper controls and planning, a conversion can take place with a minimum of disruption to operations and personnel. Among the most critical elements of the engagement are *definition of objectives and analysis of needs*. These establish the parameters of the automated system and help the client adopt reasonable expectations for performance and cost. Other major activities include software and hardware selection, physical installation, and staff training.

Sample Forms and Letters

Exhibit 1

Engagement Letter—Evaluation and Selection

CPA & Company
Anytown, USA 00000

August 1, 19XX

Mr. Joseph White
XYZ Corporation
100 Main Street
Anytown, USA 00000

Dear Mr. White:

I appreciated the opportunity to meet with you to discuss automating your company's accounting systems. This letter outlines the arrangements we made to assist you in meeting your company's automation needs.

Engagement Objectives

The objectives of our engagement are to make recommendations about (1) which of your manual accounting systems are appropriate for computerization and (2) which specific hardware and packaged software will satisfy your requirements.

Engagement Scope

CPA & Company will analyze your company's manual accounting system and procedures and review available hardware and packaged software. Since our firm is not supplying the hardware and software, we cannot give you an express warranty of fitness for a particular purpose. However, the hardware and software vendors supply a limited warranty.

The engagement will last five days, beginning on August 3, 19XX, and ending on August 7, 19XX. We will perform all work in accordance with the Statements on Standards for Management Advisory Services set forth by the American Institute of Certified Public Accountants.

Engagement Approach

We will use a step-by-step approach, as follows:

1. Define your requirements for a microcomputer-based accounting system. To identify appropriate changes or enhancements, we will evaluate your current manual system and interview selected personnel. This fact-finding will—
 - Determine what data the system will contain.
 - Define the reports you wish to have.

- Establish the transaction volume.
 - Estimate the importance of each system element.
2. Determine your manual system costs so that we can estimate the potential savings of converting it to an automated system.
 3. Evaluate the cost-benefit relationship of each accounting application being considered for conversion, as well as nonaccounting applications that are useful in the accounting function, so that you may decide what accounting elements to automate.
 4. Establish criteria to select specific software packages. Use the criteria to rate the features of commercially available software packages, review relevant literature, and evaluate vendor documentation.
 5. Identify and evaluate compatible hardware alternatives.

Your company will be expected to do the following:

- Provide the necessary records or documents.
- Make your staff available for interviews and meetings.
- Cooperate with our staff in developing solutions.

Engagement Benefits

When we complete this engagement, our report will provide you with an opportunity to review and discuss your accounting requirements for data processing and reporting and the suggested software packages and hardware for satisfying your company's accounting requirements. This knowledge will help you make an informed decision about which software/hardware system is best for your company.

Engagement Staffing and Scheduling

As we stated earlier, we will begin the engagement on August 3, 19XX, and expect to complete it in five days. During this period your staff will be heavily involved, especially you and your comptroller. The greater your staff's participation in this engagement, the easier it will be for them to adapt to the automated system.

I will supervise the consulting engagement. Harold Baines, who has performed similar EDP evaluations for the last ten years, will be in charge of the fieldwork.

Engagement Completion

We will conclude the engagement by giving you our analysis of your company's automation needs and our software and hardware recommendations. At that time we will also submit our final report.

If, during the course of the engagement, either of us becomes aware of circumstances that would preclude its successful conclusion, either party may terminate the engagement by notifying the other in writing.

After we conclude the engagement and deliver our final report, we can provide implementation guidelines and assistance. At that time, we will submit our proposal for providing additional services, if you desire them.

Fee, Billing Arrangements, and Payment

We base our fee for this engagement on time expended at our standard hourly rates. We estimate the cost of the project at \$X,XXX plus any out-of-pocket expenses,

such as transportation or materials costs. A retainer fee of \$XXX is due on your acceptance. We will bill you for the balance and out-of-pocket expenses on August 31, 19XX, and we will expect payment by September 15, 19XX.

Acceptance of the Engagement

Please acknowledge acceptance by signing this letter and returning one copy to us, together with a check for \$XXX. Thank you for retaining us. We hope this will be the beginning of a long and mutually beneficial relationship.

Sincerely,

John Doe, CPA

Approved by _____
President

Date

Work Plan—Evaluation and Selection

Client _____

<i>Task</i>	<i>Estimated Hours</i>	<i>Assigned to</i>	<i>Performed by*</i>	<i>Start Date</i>	<i>Target Date</i>	<i>Completion Date</i>
Define and document client's objectives.	_____	_____	_____	_____	_____	_____
Prepare engagement letter.	_____	_____	_____	_____	_____	_____
Evaluate current system:						
Document accounting procedures.	_____	_____	_____	_____	_____	_____
Determine transaction volume.	_____	_____	_____	_____	_____	_____
Estimate (approximately) current accounting costs.	_____	_____	_____	_____	_____	_____
Define personnel functions.	_____	_____	_____	_____	_____	_____
Evaluate and document nonaccounting applications.	_____	_____	_____	_____	_____	_____
Estimate costs of automated system.	_____	_____	_____	_____	_____	_____
Establish and prioritize application criteria.	_____	_____	_____	_____	_____	_____
Prepare summary report needs for client and obtain acknowledgment.	_____	_____	_____	_____	_____	_____
Evaluate software.						
Compare with application criteria.	_____	_____	_____	_____	_____	_____
Evaluate documentation.	_____	_____	_____	_____	_____	_____
Contact other users.	_____	_____	_____	_____	_____	_____
Select vendor(s) and obtain appropriate software.	_____	_____	_____	_____	_____	_____
Evaluate hardware.						
Determine characteristics.	_____	_____	_____	_____	_____	_____
Evaluate performance.	_____	_____	_____	_____	_____	_____
Select vendor(s)/ manufacturer(s).	_____	_____	_____	_____	_____	_____
Prepare summary report for client.	_____	_____	_____	_____	_____	_____

*Key: C = client; P = practitioner; VS = vendor—software; VH = vendor—hardware.

Checklist of Accounting System Functions

Company name _____

Department, division, subsidiary name _____

Client contact _____

Industry _____

Number of subsidiaries/divisions _____ Department _____
(List on separate sheet.)

Applications

- | | |
|--|---|
| <input type="checkbox"/> Accounts receivable/receipts | <input type="checkbox"/> Job cost |
| <input type="checkbox"/> Accounts payable/disbursement | <input type="checkbox"/> Process cost |
| <input type="checkbox"/> General ledger | <input type="checkbox"/> Purchase order |
| <input type="checkbox"/> Inventory control | <input type="checkbox"/> Sale order |
| <input type="checkbox"/> Payroll/personnel management | <input type="checkbox"/> Fixed assets |
| | <input type="checkbox"/> Point of sale |

Other _____

Current application(s) _____

Number of accounting personnel _____

Last year's sales \$ _____ Cost of sales \$ _____

Net income \$ _____ Number of customers _____

Number of vendors _____ Number of employees _____

Checklist of Application Functions—General Ledger

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Data elements				
Year-to-date data	()	()	()	_____
Monthly budget data	()	()	()	_____
Prior-year actual data	()	()	()	_____
Code number length				
Department codes	()	()	()	_____
Company codes	()	()	()	_____
Nondollar accounts	()	()	()	_____
Reports				
Chart of accounts	()	()	()	_____
Transaction journal	()	()	()	_____
General ledger activity	()	()	()	_____
Trial balances	()	()	()	_____
Income statement				
Monthly and year-to-date	()	()	()	_____
Year-to-date only	()	()	()	_____
Balance sheet	()	()	()	_____
Operating budget	()	()	()	_____
Schedule				
Actual vs. budgeted	()	()	()	_____
Actual vs. prior year's	()	()	()	_____
Department expense reports				
Customized reports	()	()	()	_____
Other	()	()	()	_____
_____	()	()	()	_____
_____	()	()	()	_____
Processing				
Transaction batch data entry	()	()	()	_____
Real-time (on-line) posting	()	()	()	_____
Multicompany processing	()	()	()	_____
User-defined fiscal months	()	()	()	_____
Automatic reversing entries	()	()	()	_____
Recurring entries	()	()	()	_____
Automatic monthly closing	()	()	()	_____
Prior-period adjusting	()	()	()	_____
Balanced batched-only processing	()	()	()	_____
Error detection and correction	()	()	()	_____

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Special				
Inquiries	()	()	()	_____
Graphics	()	()	()	_____
Interface with data manager	()	()	()	_____
Loan amortization capabilities	()	()	()	_____
Present and future value calculations	()	()	()	_____
Other				
_____	()	()	()	_____
_____	()	()	()	_____
_____	()	()	()	_____
Data importing	()	()	()	_____
Data exporting	()	()	()	_____
Consolidation	()	()	()	_____

Checklist of Application Functions—Accounts Receivable

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Data elements				
Basic data: customer name, address, phone number, credit limit, current balance, customer classification	()	()	()	_____
Sales data: sales representative contact, tax status, current-month and 12-month sales history	()	()	()	_____
Shipping address	()	()	()	_____
Aged trial balance on demand	()	()	()	_____
Finance charges	()	()	()	_____
Last sale date	()	()	()	_____
Last invoice, last payment	()	()	()	_____
Average time to pay	()	()	()	_____
Reports				
Invoices	()	()	()	_____
Customer list	()	()	()	_____
Customer labels	()	()	()	_____
Invoice, cash receipts, and accounts adjustment list	()	()	()	_____
Trial balance	()	()	()	_____
Statements on demand	()	()	()	_____
Aged accounts receivable list	()	()	()	_____
Cash flow report	()	()	()	_____
General ledger transaction summary	()	()	()	_____
Processing				
Batch data entry	()	()	()	_____
Balance entry	()	()	()	_____
Open item	()	()	()	_____
Automatic sales tax	()	()	()	_____
Credit memos applied to open items	()	()	()	_____
Automatic service charge	()	()	()	_____
Cash payments applied to				
Total due	()	()	()	_____
Single invoice	()	()	()	_____
Multiple invoices	()	()	()	_____
Finance charge	()	()	()	_____

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Cash on account	()	()	()	_____
Automatic recurring invoices	()	()	()	_____
Custom aging periods	()	()	()	_____
Special features				
On-screen inquiry	()	()	()	_____
Real-time invoicing	()	()	()	_____
Customized invoice format	()	()	()	_____
Word processing capabilities	()	()	()	_____
Other				
_____	()	()	()	_____
_____	()	()	()	_____

Checklist of Application Functions—Accounts Payable

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Data elements				
Vendor name, address, phone, contact, current amount due (normal terms), current-month and year-to- date purchases	()	()	()	_____
One-time vendors	()	()	()	_____
Last purchase amount and date	()	()	()	_____
Invoice data: amount, account distribution				
Invoice date	()	()	()	_____
Due date	()	()	()	_____
Discount date	()	()	()	_____
Receipt date	()	()	()	_____
Discount terms	()	()	()	_____
Purchase order number	()	()	()	_____
Job or product codes	()	()	()	_____
Reports				
Vendor master list	()	()	()	_____
Invoice and account adjustment registers	()	()	()	_____
Open items	()	()	()	_____
Checks and stubs	()	()	()	_____
Check register	()	()	()	_____
Prepaid checks	()	()	()	_____
Aged trial balances	()	()	()	_____
Cash requirements summary				
Weekly	()	()	()	_____
Monthly	()	()	()	_____
Purchase journal	()	()	()	_____
Form 1099	()	()	()	_____
General ledger transaction summary and interface	()	()	()	_____
Processing				
Transaction batch processing	()	()	()	_____
Invoice payment holding	()	()	()	_____
Manual payments	()	()	()	_____
Partial payments	()	()	()	_____
Automatic payment selection	()	()	()	_____
Custom check format	()	()	()	_____

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Manual text adjustments to invoices	()	()	()	_____
Multiple companies/single vendor file	()	()	()	_____
Job cost data	()	()	()	_____
Inventory purchases	()	()	()	_____
User-defined aging periods	()	()	()	_____

Checklist of Application Functions—Inventory

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Basic data				
Item number	()	()	()	_____
Item description	()	()	()	_____
Quantity on hand	()	()	()	_____
Unit of measure	()	()	()	_____
Unit costs	()	()	()	_____
Unit price	()	()	()	_____
Year-to-date units sold	()	()	()	_____
Rates of dollar sales to cost of goods sold	()	()	()	_____
Inventory category	()	()	()	_____
Order-point quantity	()	()	()	_____
Order quantity	()	()	()	_____
Quantities committed	()	()	()	_____
Last vendor/last cost	()	()	()	_____
Inventory location	()	()	()	_____
Multiple price levels	()	()	()	_____
Sales unit of measure	()	()	()	_____
LIFO cost detail	()	()	()	_____
FIFO cost detail	()	()	()	_____
Average cost detail	()	()	()	_____
Markup factor	()	()	()	_____
Processing				
Transaction batch processing	()	()	()	_____
Physical inventory adjustment	()	()	()	_____
Tracking of committed sales orders	()	()	()	_____
Tracking of sales back orders	()	()	()	_____
Tracking of quantities on order	()	()	()	_____
Other	()	()	()	_____
_____	()	()	()	_____
_____	()	()	()	_____
Reports				
Prices	()	()	()	_____
Inventory	()	()	()	_____
Receipts	()	()	()	_____
Sales	()	()	()	_____
Physical adjustments	()	()	()	_____
Reorder analysis	()	()	()	_____
Sales (in dollars)	()	()	()	_____
Slow-moving items	()	()	()	_____
Item cross-references	()	()	()	_____

<u>Features</u>	<u>Required</u>	<u>Desirable</u>	<u>No Need</u>	<u>Frequency</u>
Stock transfers	()	()	()	_____
Physical-inventory worksheets	()	()	()	_____
Bin and location labels	()	()	()	_____
General ledger summary	()	()	()	_____
Graphics capabilities	()	()	()	_____

Preliminary Cost Analysis Worksheet

Estimated Monthly Cost

	<i>Application</i>					
	<i>G/L</i>	<i>A/R</i>	<i>A/P</i>	<i>Inv</i>	<i>Pay</i>	<i>Other</i>
Automated System						
Software						
Purchase/amortization	_____	_____	_____	_____	_____	_____
Maintenance and support	_____	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____	_____
Hardware						
Purchase amortization	_____	_____	_____	_____	_____	_____
Maintenance	_____	_____	_____	_____	_____	_____
Insurance	_____	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____	_____
Supplies						
Forms	_____	_____	_____	_____	_____	_____
Ribbons	_____	_____	_____	_____	_____	_____
Disks and tapes	_____	_____	_____	_____	_____	_____
Telephone line	_____	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____	_____
Personnel						
Hours	_____	_____	_____	_____	_____	_____
Dollar amount	_____	_____	_____	_____	_____	_____
Ongoing training and support	_____	_____	_____	_____	_____	_____
Total automated cost	_____	_____	_____	_____	_____	_____
Current System						
Personnel	_____	_____	_____	_____	_____	_____
Supplies	_____	_____	_____	_____	_____	_____
Processing charges	_____	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____	_____
Total current cost	_____	_____	_____	_____	_____	_____
Direct cost differential	_____	_____	_____	_____	_____	_____

Needs Evaluation Report

CPA & Company
Anytown, USA 00000

August 5, 19XX

Mr. Joseph White
XYZ Corporation
100 Main Street
Anytown, USA 00000

Dear Mr. White:

Following is a description of the accounts receivable systems and procedures your company employs, the problems we observed during our evaluation, and our suggestions for improving operations.

Procedures

XYZ Corporation produces approximately 450 invoices each month for a base of one thousand customers. Two clerks, Janice and Jane, take orders and produce these invoices. However, Janice alone records the invoices on the customers' subsidiary ledger cards and the sales journal, using a one-write accounting system. Janice controls the invoices, which are prenumbered. However, since Jane also has a supply of the invoices, they are not recorded in sequence.

At the end of each month, Janice prepares an adding machine tape of each customer's ledger card balance and compares the total of the customers' balances with the accounts receivable control balance. The task takes approximately three to four days. Janice then identifies the past-due accounts by examining the individual customer ledger cards, and Jane receives the accounts for collection.

Cash receipts are given to Janice each day, but without any documentation. She records receipts on the customer ledger cards. She then prepares the bank deposit and a four-part bank deposit slip and turns them over to you. The bank validates the deposit slip and keeps two of the parts. Janice retains one customer copy and forwards the other to the accounting department.

Problem Areas

The problem areas are in personnel utilization and internal control. In our opinion, better use of Janice's time will alleviate most of the internal control problems we observed. The current procedures for recording invoices are no longer sufficient because sales volume has risen significantly. The increase in the daily number of invoices over the past six months has caused a bottleneck at the end of each month.

A very competent employee carries out the routine task of proving accounts receivable. However, the aging of accounts is done only once a month, by which time some accounts are over thirty days past due. In addition, customers with seriously past-due accounts can still make purchases.

As mentioned in our management letter, the same person should not be responsible for recording both the invoices and the payments to customers' ledger cards. Furthermore, a total of the receipts should be obtained before they are turned over to Janice, and that total and the individual checking amounts should be compared to the amount deposited. As we mentioned, this weakness in internal control necessitates additional auditing steps that result in increased fees.

Solution

A computerized system would benefit your company by resolving the procedural problems described above. Jane alone could handle invoice production because she would no longer have to type out the entries. Janice would be responsible for recording the cash receipts. The computerized system can produce daily past-due reports. Thus, collection efforts can start the very day the invoices become past due. Selling to customers whose accounts are seriously past due need no longer occur. Since Janice has a good telephone manner, she can handle the collection function.

Although you are planning to hire another accounts receivable clerk to eliminate the monthly bottleneck, introducing a computerized accounts receivable system would eliminate the need for this position. Our preliminary cost-benefit analysis shows a direct benefit in the range of \$XX.XX per month as a result.

Sincerely,

John Doe, CPA

Vendor Evaluation Checklist

Vendor _____ Date _____

Evaluator _____

<u>Criteria</u>	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>
Experience				
Knowledge of industry	()	()	()	()
Number of installations	()	()	()	()
Financial stability	()	()	()	()
Business maturity	()	()	()	()
Accounting background	()	()	()	()
Software performance	()	()	()	()
New-product development	()	()	()	()
Support				
Local representation	()	()	()	()
References	()	()	()	()
Installation support	()	()	()	()
Training support	()	()	()	()
Update policy	()	()	()	()
Service contract	()	()	()	()
Modifications availability	()	()	()	()
Documentation	()	()	()	()

Checklist for Software Documentation and Special Features

	<u>Yes</u>	<u>No</u>
<u>Instruction Manual</u>		
1. Layout		
• Appearance is professional.	_____	_____
• Sections are organized in order of processing steps.	_____	_____
• Screen images in the manual appear as they will on the computer screen.	_____	_____
2. Content		
• Installation instructions are clear and understandable.	_____	_____
• Setup instructions show how to format data, with samples of the suggested formats.	_____	_____
• The table of contents lists chapter titles and topics.	_____	_____
• Backup and restore instructions are clear and understandable.	_____	_____
• The index is sufficiently detailed, including cross-references.	_____	_____
• An error-message section gives a full description of each error and possible ways to correct it.	_____	_____
• Instructions for creating and producing reports are clear and understandable.	_____	_____
• A technical section explains file structure and the file access table (program vs. data files).	_____	_____
• Audit trails are clear and defined.	_____	_____
3. Style		
• The writing tone is friendly.	_____	_____
• Tutorials include on-screen descriptions of what the input fields contain.	_____	_____
<u>Other Documentation</u>		
1. Support References		
• The application includes a customer registration card.	_____	_____
• The vendor's support policy clearly indicates the length of time that support and ongoing troubleshooting are available after purchase.	_____	_____
• A description of the vendor's update policy is included.	_____	_____
• Newsletters are periodically sent to registered owners.	_____	_____

	<u>Yes</u>	<u>No</u>
2. Special Features		
• Passwords protect and date access to applications and data files.	_____	_____
• Backup and restore commands are prompted by the applications programs.	_____	_____
• Multiuser capability is available either through local area network or multiuser systems.	_____	_____
• Source codes are available from the vendor or from an alternative source, such as a third-party developer, should the vendor go out of business.	_____	_____
• The program is copy protected.	_____	_____

Hardware Requirements Analysis

Checklist for Accounts Receivable File Sizing

Company _____ Date _____

	<u>Current</u>	<u>In 2 Years</u>
1. Number of invoices processed daily	_____	_____
2. Number of lines per invoice	_____	_____
a. Multiply line 2 by manufacturer's size factor	_____	_____
b. Disk space required for daily activity	_____	_____
3. Average number of open invoices	_____	_____
4. Average number of lines per invoice	_____	_____
a. Multiply line 4 by manufacturer's size factor	_____	_____
b. Disk space required for open invoices	_____	_____
5. Number of customers	_____	_____
a. Multiply line 5 by manufacturer's size factor	_____	_____
b. Disk space required for customer records	_____	_____
6. Sales history: Daily activity disk requirement (See line 2b, above.)	_____	_____
a. Multiply line 6 by days of sales history to be maintained	_____	_____
b. Disk space required	_____	_____
7. Total space required for data files (Add lines 2b, 4b, 5b, and 6b.)	_____	_____
8. Disk space required for programs	_____	_____
9. TOTAL DISK SPACE—ACCOUNTS RECEIVABLE (Add lines 7 and 8.)	_____	_____

Note: Most accounting systems include detailed sizing instructions that protect file-size-specific packages. This checklist contains some of the most important elements of a receivables application and is included to guide practitioners in constructing their own checklists for a specific engagement.

Summary Report of Software and Hardware Recommendations

Software Analysis

We have reviewed the various accounting software options available to XYZ Corporation given the company's defined requirements. We have focused on systems that meet more than 90 percent of your stated requirements and that are compatible with a multiuser local area network (LAN) configuration.

Current System

The current accounting service processes general ledger and accounts payable. Using a batch system, it often requires substantial time between data entry and reporting. Continuing support and maintenance of the system is the responsibility of the service center.

XYZ wishes to maintain its multiuser interface and allow simultaneous access by both clerical and management personnel.

Software Selection Methodology

We interviewed XYZ management to determine their needs and likes and to prioritize them. We began with the general ledger and followed the same procedure for accounts payable and general system features. Using the information gathered to evaluate available software, we attended vendor demonstrations, reviewed documentation, researched independent comparative evaluations (*PC Magazine* reports and Datapro and Auerbach looseleaf services), and drew on our experience with similar client situations. We compiled a list of packages that exceed 90 percent of the general ledger requirements, have an integrated accounts payable module, and are compatible with a network environment.

Unique Requirements

XYZ requires the ability to handle remote data entry with review and approval by management before posting transactions. Another unique requirement is to handle both fiscal and tax-year reporting. The fiscal year-end is March 31, while December 31 is used for the tax year. XYZ also needs to download and upload accounting data into spreadsheet packages for analysis. Based on these requirements and our data gathering, we chose to evaluate these packages:

<u>Package</u>	<u>Version</u>	<u>Vendor</u>
A	4.03	Vendor A
B	90	Vendor B
C	4.0	Vendor C
D	4.0	Vendor D
E	4.0	Vendor E

In the following section we recommend the package that best satisfies your needs, including system compatibility.

Conclusion and Recommendation

We recommend package A. It provides the most flexibility in both data control and reporting on an ad hoc basis. Furthermore, the database management application most closely resembles the time-sharing mainframe accounting system XYZ currently uses.

Package A is also the only package that reports prior-year data in combination with current-year figures to create effective tax-year reporting. Additionally, through the interface modules, XYZ can upload and download accounting data directly into electronic spreadsheets.

Package A is compatible with a local area network. Most other packages require a lengthy and complicated data conversion process.

Hardware Analysis

We have defined and documented multiuser hardware configuration options that will allow XYZ to successfully implement a microcomputer-based system for general ledger and accounts payable applications.

Current System

The current time-sharing, mainframe-based system supports three direct users and two others who use system data for other applications. A connected microcomputer system must maintain this level of use and provide for expansion.

Physically the users are spread out. However, twisted-pair wire connects the existing terminals to a central communications center. XYZ would also like to centralize all system printing at this communications center to maintain confidentiality and reduce office noise levels.

Hardware Selection Methodology

We focused on defining and selecting an appropriate hardware option that balances cost, functionality, security, technology, and cabling to optimize XYZ's operating environment. To this end, we reviewed alternatives that feature more than one workstation, permit multiple users access to central data storage and printing, and allow for centralized security and control of accounting data.

Conclusion and Recommendation

CPA & Company and XYZ agreed prior to the engagement that a multiuser, media-sharing local area network is the most appropriate hardware for XYZ. While we realize that a LAN is costly, we believe that any system other than a LAN will cause substantial processing and information delays and unacceptable loss of control over data.

We recommend that you acquire Sample-Q computer hardware, which is compatible with recommended software package A and your computer cabling. If you should select software other than package A, you may find alternative computer equipment appropriate.

Engagement Letter—Implementation

CPA & Company
Anytown, USA 00000

August 1, 19XX

Mr. Joseph White
XYZ Corporation
100 Main Street
Anytown, USA 00000

Dear Mr. White:

I enjoyed meeting with you to discuss implementing your new microcomputer-based accounting system. This letter outlines the arrangements we made.

Engagement Objectives

The objectives of our engagement are to (1) implement your accounting software and microcomputer hardware, including all peripheral equipment, and (2) train your staff to operate the computerized system effectively.

Engagement Scope

CPA & Company will review your recently acquired microcomputer software and hardware and will complete implementation of the new system, including installation of the software and data conversion. Since our firm did not select or supply the software and hardware, we cannot guarantee that the system can operate without further modification. If modifications are necessary, we will bill you for the additional service at our regular rate.

We will perform all work in accordance with the Statements on Standards for Management Advisory Services set forth by the American Institute of Certified Public Accountants.

You and your staff will be responsible for various implementation decisions and for the ultimate operation of the system. We will serve in an advisory role until you and your staff have acquired sufficient experience to manage the computer system on your own or until October 1, 19XX, whichever comes first.

Engagement Approach

We will do the following:

1. Meet with your staff to develop a plan for the system changeover.
2. Identify who will be responsible for each step in the plan.
3. Suggest changes in manual procedures to enhance the effectiveness of the system.
4. Assist your staff in determining what supplies and furniture are required.
5. Help your staff design and document the coding systems required for each application.

6. Assist and train your staff in developing controls, such as proper backup and password procedures, daily logs, and problem reports.
7. Install each application.
8. Supervise and train your staff in creating the master files.
9. Verify ending balances as required to determine that the data entered is accurate.
10. Supervise tests of the system to ensure that it is ready for daily operation.
11. Monitor daily operation until October 1 to determine whether additional training, problem resolution, or enhancement is required.
12. Evaluate the actual results produced by the system against your planned objectives.
13. Report our findings and recommendations for further action.

Benefits

When we complete our engagement, your staff will be trained to operate your microcomputer system, which will effectively run all required accounting functions. We anticipate that, as a result, your business operations will be more accurate and cost efficient.

Engagement Scheduling and Staffing

The primary engagement will begin on August 3, 19XX, and we expect to complete it in six days. During this period your staff will be extensively involved, especially you and your comptroller. The greater your staff's participation in this engagement, the easier it will be for them to adapt to the automated system and operate it.

I will supervise the consulting engagement. Tim Black, who has performed similar microcomputer implementations for the last ten years, will be in charge of the fieldwork. CPA & Company will be available for follow-up consultation until October 1, 19XX, at no additional fee.

Project Completion

After we conclude the engagement, we will meet with you to discuss the results of the implementation. At that time we will submit a written report that includes instructions for operating the system. We will also propose additional services, if any are needed.

If at any point during the engagement either party becomes aware of circumstances that would preclude a successful completion, either party may terminate the engagement by notifying the other in writing.

Fees

We estimate our fee for this engagement will be \$X,XXX. We have exercised care in preparing this estimate and believe it accurately indicates the scope of the work. We have not included any allowance, however, for factors beyond our control, such as changes in your requirements, variations between estimated and actual processing volumes, time for consultation and assistance with error corrections, and the capability of your staff. Accordingly, this fee estimate does not in any way constitute a fixed-fee quote. We will bill you monthly or at the conclusion of the engagement, at CPA & Company's standard hourly rates, for the time our assigned staff actually spends on the project, plus any expenses incurred on your behalf for supplies, postage, and telephone use.

The fee estimate in this letter is exclusively for implementing the specified software application modules on computer hardware purchased by your company. CPA & Company does not provide any hardware or software nor does this engagement include services other than computer consultation.

Engagement Acceptance

If the terms outlined here are acceptable to you, please sign and date this letter and return one copy to us. If you have any questions, please do not hesitate to contact us.

Sincerely,

John Doe, CPA

Approved by _____
President, XYZ Corporation

Date

Work Plan—Implementation

<u>Task</u>	<u>Estimated Hours</u>	<u>Assigned to</u>	<u>Performed by*</u>	<u>Start Date</u>	<u>Target Date</u>	<u>Completion Date</u>
Prepare engagement letter. Define responsibilities.	_____	_____	_____	_____	_____	_____
Determine project schedule.	_____	_____	_____	_____	_____	_____
Establish coding procedure.	_____	_____	_____	_____	_____	_____
Develop numbering system for each application.	_____	_____	_____	_____	_____	_____
Document numbering system.	_____	_____	_____	_____	_____	_____
Install/arrange hardware in client's office.	_____	_____	_____	_____	_____	_____
Provide for system security.	_____	_____	_____	_____	_____	_____
Establish and document a password procedure.	_____	_____	_____	_____	_____	_____
Establish backup procedures and prepare a written policy.	_____	_____	_____	_____	_____	_____
Set up monitoring procedures.	_____	_____	_____	_____	_____	_____
Install software.	_____	_____	_____	_____	_____	_____
Create master files.	_____	_____	_____	_____	_____	_____
Establish controls for data input.	_____	_____	_____	_____	_____	_____
Verify initial balances.	_____	_____	_____	_____	_____	_____
Arrange/provide training of personnel on operating system and application software.	_____	_____	_____	_____	_____	_____
Conduct a postinstallation review.	_____	_____	_____	_____	_____	_____

*Key: C = client; P = practitioner; VS = vendor—software; VH = vendor—hardware.

Backup Log

<u>Files Backed Up</u>	<u>Operator</u>	<u>Date</u>	<u>Time</u>	<u>Medium</u>	<u>Storage Location</u>
OSAS/DATA/*.*	RMS	11-21-XX	4:35p	A	DE3
OSAS/PROGRAMS/*.*	RMS	11-26-XX	4:10p	B	DE3
OSAS/DATA/*.*	RMS	11-28-XX	4:35p	C	DE3
OSAS/DATA/*.*	RMS	12-04-XX	4:35p	A	DE3

System Problem Report

(Read instructions before filling out this form.)

Site _____

INITIAL PROBLEM ASSESSMENT

Suspected Cause

- A. Equipment
- B. Software
- C. Procedures
- D. Data
- E. Operator
- F. Environment

Label Titles of Data Storage Media in Use

Disk A _____
 Disk B _____
 Other _____
 Tape _____

Notes _____

Problem occurred: Date _____ Time _____
 System down? Yes No _____ (Minutes)
 Device down? Yes No _____ (Minutes)
 Lost time _____ Recovery time _____

Problem Information

CRT information _____

Description of problem _____

Originator's signature _____ Date _____

Response Requested

Response: Immediate/Deferred

	Time Spoke	Call	Support	Repair	Hours	Invoice No. for
Company	Called	to	Returned	on Site	Complete	Billed
						Billed Service

PROBLEM RESOLUTION

Actual Problem Code
(circle one)

Problem referred to _____ Date _____ A B C D E F G

Action: No action required

Action taken _____

Description of action _____

Signed _____ Date _____

(Instructions follow.)

Instructions for System Problem Report

Important: Complete the System Problem Report and attach any supporting evidence, such as generated reports or a hard copy of appropriate screens. Complete all sections of the report through the originator's signature section, and have the person responsible for correcting the problem complete the problem resolution section.

Initial Problem Assessment

Place an X in the box to the left of the suspected cause of the problem. Mark only one box. Provide additional information, as appropriate, in the notes section.

- A. Equipment If you think there is an equipment problem, indicate which device.
- B. Software In the case of program failure, enter the name or number of the program.
- C. Procedures If you believe there is a mistake in the procedures or operating instructions, identify the procedures.
- D. Data No additional information is necessary.
- E. Operator Identify the system operator.
- F. Environment If you think the problem is due to loss of power, static electricity, humidity, or something else, indicate it.

Labels of Data Storage Media in Use

Record information from the labels of all data storage media (disks, tapes, cassettes, cartridges, and so on) in use when the problem occurred.

Problem Information

Note the date and exact time of failure. If the entire system goes down (it won't work at all) or only a single device goes down, circle *yes* at the appropriate line and enter the number of minutes it has been down.

Lost time is the interval from the time processing failed to the time processing successfully resumed. Enter the amount of lost time.

Recovery time involves all efforts necessary to reconstruct files, replace hardware, and so on, so that processing can resume. If there was recovery time, enter the number of minutes it took to recover the data.

Enter under *CRT messages* any error messages displayed on the screen.

Under *description of problem*, write a clear and accurate description of the activities preceding the failure as well as a complete description of the error. In addition, record any recovery measures you attempted.

Response Requested

Maintain a log of all phone calls you place for support service or equipment service pertaining to the problem. If the problem requires immediate attention, circle *immediate*. Circle *deferred* if you placed the call now, but you will get an answer at a later date.

Record the date and time that support arrives on site, as well as the date and time the repair is completed. If you receive an invoice for the service, fill in the actual number of hours billed and the invoice number.

Originator's Signature

After filling in the above information, sign and date the report in the space provided. Retain the report for future reference. Follow the instructions below and then file the report and invoice with the appropriate individual or division.

Problem Resolution

Enter the name of the person who will investigate and correct the problem, and record the date of referral.

Have the person who resolves the problem circle the actual cause, which may or may not be the same as the suspected cause noted at the top of the form. Place an X in the box to the left of the appropriate action category:

- An X in *no action required* indicates that it is not necessary for anyone other than the originator to fix the problem.
- An X in *action taken* indicates that the problem was corrected. Enter the date of completion and a description of the action.

Have the person responsible for correcting the problem sign and date the report after completing the corrective action.

Daily Processing Checklist

Operator _____

<u>Action</u>	<u>Application</u>	<u>Complete</u>	<u>Initials</u>	<u>Entry Date</u>	<u>Cutoff Date</u>	<u>Procedure Name on Menu</u>
Input procedures by batch.						
1. Run tape of invoices.		_____	_____	_____	_____	
2. Input transactions. (Note: Print open invoice worksheet for open item customers before inputting their cash receipts.)	AR	_____	_____	_____	_____	Sales and Cr/Dr memo processing or cash receipts processing
3. Print transaction edit list.	AR	_____	_____	_____	_____	
4. Make corrections.	AR	_____	_____	_____	_____	
5. Print corrected transaction edit list.	AR	_____	_____	_____	_____	
6. Post transactions.	AR	_____	_____	_____	_____	

Input Record

Type of transaction _____

Invoice nos.: Beginning no. _____ Ending no. _____

Batch total _____

Bibliography

Books

- American Institute of Certified Public Accountants (AICPA). *EDP Engagement: Software Package Evaluation and Selection* (Technical Consulting Practice Aid No. 4). New York: AICPA, 1983.
- Carmichael, D. R., W. J. Gole, D. Pallais, and H. S. Schecter. *Guide to Small Business Consulting*. Fort Worth, Tex.: Practitioners Publishing, 1987.
- Gildersleeve, T. R. *Data Processing Project Management*. 2d ed. New York: Van Nostrand Reinhold, 1985.
- Lucas, H. C., Jr. *Information Systems Concepts for Management*. 2d ed. New York: McGraw-Hill, 1982.
- . *The Analysis, Design, and Implementation of Information Systems*. 3d ed. New York: McGraw-Hill, 1985.
- Lustman, F. *Managing Computer Projects*. Reston, Va.: Reston Publishing Company, 1985.
- Martin, James, and C. L. McClure. *Software Maintenance: The Problem and Its Solutions*. Englewood Cliffs, N.J.: Prentice-Hall, 1983.
- Nash, J. F., and M. B. Roberts. *Accounting Information Systems*. New York: Macmillan, 1984.
- National Society of Public Accountants. *Portfolio of Accounting Systems for Small and Medium-Sized Businesses*. Rev ed. New York: Prentice-Hall, 1986.
- Nygren, W. V. *Business Forms Management*. New York: AMACOM, 1980.
- Perry, W. E. *Management Strategies for Computer Security*. Boston: Butterworth Publishers, 1985.
- Powers, M. D. Adams, and H. D. Mills. *Computer Information System Development: Analysis and Design*. Cincinnati: South-Western Publishing, 1984.
- Weinberg, G. M. *Rethinking Systems Analysis and Design*. Boston: Little, Brown, 1982.
- Wu, F. H. *Accounting Information Systems Concepts for Management*. 2d ed. New York: McGraw-Hill, 1983.

Magazines

Access, the Journal of Microcomputer Applications in Engineering and Science
Ledz Publishing Co.
Box 12847
Research Triangle Park, N.C. 27709
Business Computer Systems
Cahners Publishing
Division of Reed Holdings, Inc.
275 Washington Street
Newton, Mass. 02158
Business Software
M&T Publications, Inc.
2464 Embarcadero Way
Palo Alto, Calif. 94303

BYTE
McGraw-Hill, Inc.
70 Main Street
Peterborough, N.H. 03458
Computers in Accounting
Warren, Gorham & Lamont, Inc.
210 South Street
Boston, Mass. 02111
Computer Industry Update
Industry Market Reports
Box 4537
Mountain View, Calif. 94040

Computer World

C.W. Communications
Box 880
375 Cochituate Road
Framingham, Mass. 01701

CPA Micro Report

CPA Services, Inc.
16800 West Greenfield Avenue
Brookfield, Wis. 53005

Infoworld

Popular Computing, Inc.
Subsidiary of C.W. Communications
One Park Avenue
New York, N.Y. 10016

PC Magazine

Ziff Communications Co.
One Park Avenue
New York, N.Y. 10016

PC Products

Cahners Publishing
Division of Reed Holdings, Inc.
275 Washington Street
Newton, Mass. 02158

PC Tech Journal

Ziff Communications Co.
One Park Avenue
New York, N.Y. 10016

PC World

PC World Communications
555 DeHaro Street
San Francisco, Calif. 94107

Personal Computing

Hayden Publishing Co., Inc.
50 Essex Street
Rochelle Park, N.J. 07662

Small Systems World

950 Lee Street
Des Plaines, Ill. 60016

Software Digest

One Wynnewood Road
Wynnewood, Penn. 19096

Software News

Sentry Publishing Company, Inc.
1900 West Park Drive
Westborough Office Park
Westborough, Mass. 01581

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