

## **A DECISION-TREE APPROACH TO THE DESIGN AND IMPLEMENTATION OF ACCOUNTING AND INFORMATION SYSTEMS FOR SMALL BUSINESSES**

*by Olen L. Greer*

**ABSTRACT: DIAGRAMME METHODOLOGIQUE DE PRISE DE DECISION POUR LA CONCEPTION ET L'APPLICATION DE SYSTEMES DE COMPTABILITE ET D'INFORMATION DANS LES PETITES ENTREPRISES**

La mise au point d'un système de comptabilité pouvant être administré de façon effective par le propriétaire/manager d'une petite entreprise, peut être une tâche exigeante pour un expert comptable. Les clients souhaitant avoir accès à ce genre de système ignorent fréquemment le temps et l'ensemble de connaissances nécessaires à la tenue des livres d'une entreprise si petite qu'elle soit. Plus son organisation devient complexe, plus les tâches incombant au comptable se font variées et difficiles. Le but de cet article est d'identifier les questions critiques associées à la préparation d'un système de comptabilité dans le cadre d'une petite entreprise, et de présenter un modèle pouvant être utilisé par le conseiller dans le choix du niveau d'intervention approprié.

Small business accounting consultants often receive requests to design record keeping systems that owner/managers can administer themselves. The request often comes in the following form: "Would you please help me set up my books? I don't want to hand my books over to someone else until I fully understand what's going on for myself. I don't want someone else knowing more about my business than I do."

This situation presents a rather unique problem for the consultant: The request being made is oftentimes outside the realm of possibility (or at least the realm of practicality), in that the

client has no accounting and/or bookkeeping education or experience. In other situations, the client may have sufficient knowledge, but insufficient time to maintain the necessary records. So how does the accounting consultant intervene on behalf of the client? Is it necessary to design a full-fledged, double-entry accounting system, with a complete set of journals and ledgers, or a simplified "get-by" system? Does the consultant embark on an educational program, designed to teach the client the principles of accounting or how to apply them, or simply refer the client to an accounting/bookkeeping service?

The purpose of this article is to identify the critical issues associated with a request for the design of an

Dr. Greer is associate professor of accounting at Southwest Missouri State University (SMSU) in Springfield, Missouri. In addition to teaching accounting, he served for two years as the staff accounting consultant for the SMSU Small Business Development Center.

accounting system in the small business setting, and to present a model that may be used by consultants in choosing the appropriate level of intervention.

### BACKGROUND

Two limiting assumptions were made in the development of the model:

1. *The time available for consultation with each client is limited.* This time limitation may originate from either the consultant or the client. In most "consultants-for-fee" situations, the client's limited resources will impose the most significant limitation on the amount of time available for consultant/client consultation. However, in the cases reported here, consulting services were provided through an SBA-funded Small Business Development Center (SBDC). The consulting services were free to the client; therefore, clients were generally willing to spend as much contact time as possible with the consultant, up to the SBDC-mandated limit of twelve hours.
2. *The client is an entrepreneur/owner of a business in the "pre-venture" or "early-growth" stage.* (The term "pre-venture" refers to a business that has not yet been formally opened or started.) The decision setting outlined here precludes the use of these procedures in large and/or mature organizations, as these organizations would not, in all probability, make such requests.

### MODEL DEVELOPMENT

#### A Systems Approach

The model was developed following a systems approach to decision-making.<sup>1</sup> A systems approach is especially useful when the required decision involves the consideration of a number of

<sup>1</sup>T. T. Herbert, *Dimensions of Organizational Behavior*, 2nd ed. (New York: Macmillan Publishing Co., Inc., 1981), pp. 55-82.

sequentially ordered factors.<sup>2</sup> That is, the appropriate course of action will be selected if and only if the critical factors are considered in a specific sequence. Vroom and Yetton successfully applied such an approach in the development of a model designed to assist managers in the choice of a decision-making style suitable to a particular situation.<sup>3</sup> Their model, referred to as the Vroom-Yetton Decision Tree, assists the manager in deciding when to involve subordinates in the decision-making process rather than making the decision on his own. The user of the model is led through a series of questions that can be answered "yes" and "no." This structured, decision-tree approach was used in developing the model presented below. Although the systems approach is not foreign to accounting-related issues, no similar model is now available.<sup>4</sup>

The decision model presented here was developed and refined over a two-year period on the basis of consulting experiences with over 100 different clients from the Southwest Missouri area, all of whom were clients of the Small Business Development Center located on the campus of Southwest Missouri State University in Springfield, Missouri. "Consultation failures" occurred when the consultant complied with the requests of clients to design and implement accounting systems without insuring that the client had the proper skills and/or resources necessary to properly operate the system. These consultation failures served to identify a need for a systematic approach to the task of accounting systems design.

<sup>2</sup>David R. Hampton, *Contemporary Management*, 2nd ed. (New York: McGraw-Hill Book Company, 1981), pp. 24-27.

<sup>3</sup>Victor H. Vroom and Phillip W. Yetton, *Leadership and Decision Making* (Pittsburgh: University of Pittsburgh Press, 1973).

<sup>4</sup>Faye and Mock describe a system for developing accounting flow charts based on similar procedures, but these flow charts are more descriptive than prescriptive. D. Faye and T. J. Mock, "How to Prepare Better Accounting System Flowcharts," *The Practical Accountant* (November 1986), pp. 106-118.

The critical issues to be considered when dealing with a request for the design of an accounting system in the small-business setting were (1) the amount of open time in the client's schedule; (2) the relative amount of accounting education and/or experience of the client; and (3) the relative complexity of the business setting within which the client is operating.

*Time.* Frequently, the client has no concept of the time requirements associated with "keeping the books." This issue must be addressed carefully, with an effort made not to patronize the client. The consultant's role is to determine whether or not the client or a family member or employee has the time available to attend to record keeping. Often, clients indicate that they will "make" time; in this instance, it is advisable to consider whether it is cost-effective for the client to spend time keeping books, recognizing that this effort detracts from time that may be more profitably spent doing what the client is in business to do. (It is illogical and costly for the client to perform a task that he or she can hire someone else to do at a low wage, thereby freeing the client to engage in activities that have much greater payoffs.)

*Educational and/or experiential background of the client.* The client must recognize that a certain amount of training is required in order to effectively administer an accounting system, regardless of the size or complexity of the organization. While a formal degree is not necessarily required, knowledge of the principles of accounting is required. This knowledge may have been acquired through formal education, through previous on-the-job experiences, or both. At any rate, the consultant must gather data from the client in an unobtrusive manner and make a subjective determination as to whether or not the client is educationally and/or experientially

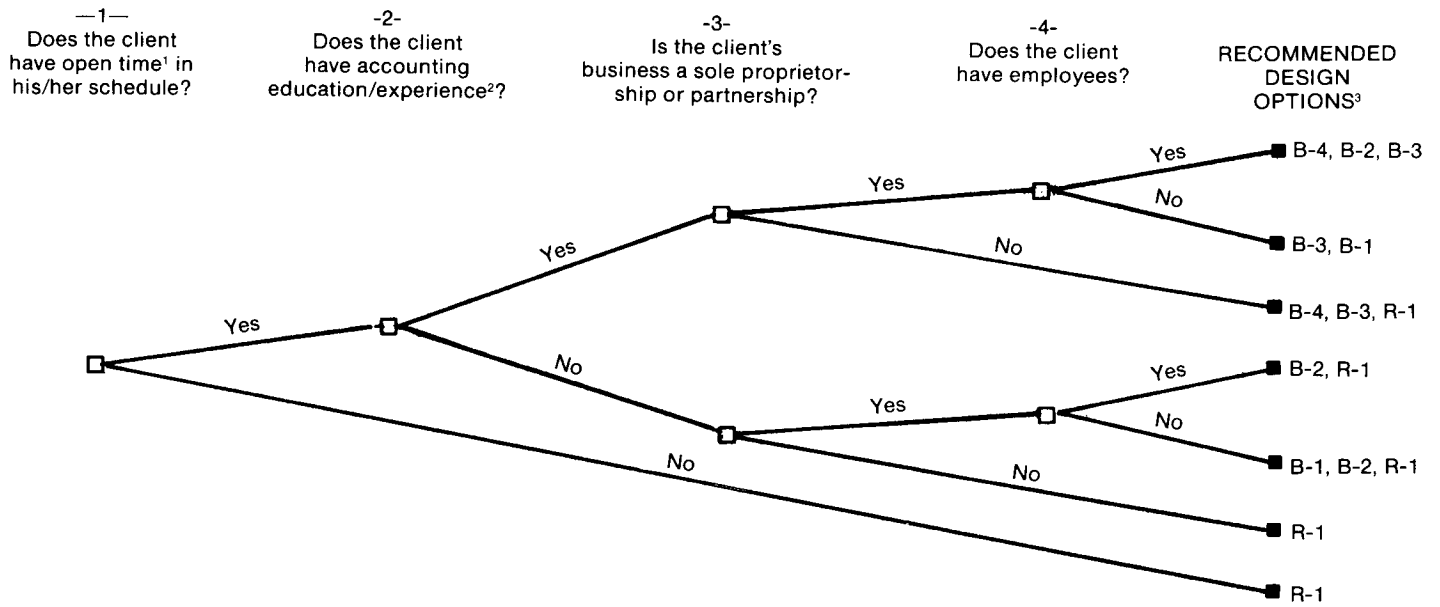
prepared to administer the accounting system.

*Complexity of the business setting.* The primary factors associated with complexity of the business setting that are related to the design of the accounting system for a small business are (1) the specific form of business organization (i.e., sole proprietorship, partnership, or corporation), and (2) whether or not the organization has employees. Accounting for a sole proprietorship or a partnership is less complex than accounting for the corporate form of business organization. Accounting for the equity of a corporation and complying with the various reporting requirements of corporations significantly increases the difficulty of the accounting task. Second, accounting for payroll can be an overwhelming task for business owners who are trying to manage and operate the business as well. Complying with the reporting requirements associated with federal income tax, FICA, state income tax, and unemployment insurance can be especially intimidating for the busy entrepreneur who has little or no accounting background. A number of other factors affect the relative complexity of the business setting, such as number of daily transactions and type of business organization—service, retail, or manufacturer. However, given the assumptions made earlier with respect to the size of the organizations receiving consultation, "form of business organization" and "having employees" are the primary concerns here.

#### THE ACCOUNTING DESIGN DECISION MODEL

Figure 1 depicts the accounting design decision model. Note that each question is structured to be answered "Yes" or "No." Reading and answering the questions from left to right leads the user of the model to the recommended accounting system design option.

**Figure 1**  
**ACCOUNTING SYSTEM DESIGN DECISION MODEL**



<sup>1</sup>"Open time" should include time available by the client and/or family members or employees.

<sup>2</sup>"Accounting education" should include "bookkeeping education/experience" and does not imply that a formal degree is required.

<sup>3</sup>The presence of two design options at the end of a branch indicates that the first option is preferable, while the second (or third) option is acceptable.

*Design Option Description*

- R-1 Referral.
- B-1 Modified system, totally administered by the client.
- B-2 Modified system, partially administered by the client.

*Design Option Description*

- B-3 Complete, double-entry bookkeeping system, totally administered by the client.
- B-4 Complete, double-entry bookkeeping system, partially administered by the client.



### The Questions

Question 1, "Does the client have open time in his/her schedule?" relates to the first factor, "Time," as discussed above. While the question calls for a "Yes" or "No" response, it should be noted that the issue of "time" involves a great deal of latitude in that almost all clients have "open time" in their schedules, at least at the point that they are seeking consultation. The real issues are "How much open time do they have?" and "How long will they have open time?" Many clients underestimated the time requirements associated with managing their businesses and later found themselves "covered up" with details that prevented them from performing the accounting-related tasks they had committed to earlier. The consultant must make a subjective determination as to whether or not the client has sufficient time to attend to accounting responsibilities. A "No" response means that the consultant, following careful consideration of all the pertinent information, has reached the conclusion that the client does not have sufficient time to attend to the accounting chores of the organization, or that it would not be cost-effective for the client to use his or her time in this manner.

Question 2, "Does the client have accounting education and/or experience?" addresses the second factor discussed earlier. This question does not imply that a formal degree is required. Likewise, the client does not necessarily need extensive accounting and/or bookkeeping experience. Rather, the issue is knowledge, and whether the client has enough related knowledge to effectively maintain and administer the accounting system for the organization. Once again, the consultant must gather the necessary information and exercise professional judgment. For example, even though the client has no education and limited experience, the consultant may make the determina-

tion that, given the relatively simple nature of the client's business and the capacity of the client to "catch on quickly," the answer to this question should be "Yes."

Question 3, "Is the client's business a sole proprietorship or partnership?" relates to the third factor, "Complexity of the business setting." As noted earlier, the accounting and reporting requirements for a corporation are more complicated and involved than those for a sole proprietorship or partnership and should be considered in this decision. One example is the contrast in accounting for the equity of the shareholders (owners) of a corporation versus accounting for the equity of the owner of a sole proprietorship. In the corporate setting, capital must be segregated into two broad categories, contributed capital and earned capital. Within each of these categories, there may be a number of different accounts to maintain. In contrast, the equity of the sole proprietorship is accounted for in two simple accounts, the Capital Account and the Drawings Account. The Tax Reform Act of 1986 has served to increase the complexity of the corporate accounting setting, in that C Corporations<sup>5</sup> may no longer elect the cash basis of accounting;<sup>6</sup> rather, use of the accrual basis of accounting is required.

Accounting for income on an accrual basis means that revenues are recognized when they are earned, not necessarily when they are received; expenses are recognized when they are incurred, not necessarily when they are paid. The "accrual basis" is contrasted with the "cash basis" for accounting, which is more simple from a record-keeping perspective, but conceptually incorrect.

<sup>5</sup>"C Corporation" refers to the standard corporate form of business organization, and can be contrasted with the "S Corporation," a modified version of the corporate form of business organization.

<sup>6</sup>American Institute of Certified Public Accountants, *1987 Tax Calendar and Reference Guide to Tax Reform Act of 1986* (Paramus, New Jersey: Prentice-Hall), p. 91.



Other complicating features of corporate accounting include franchise tax reporting, increased government regulation and scrutiny, and income taxation.

Question 4, "Does the client have employees?" also relates to the third factor, "Complexity of the business setting." Having employees increases the reporting and record-keeping chores significantly and may impact on the recommended design option proposed by the consultant. As a minimum, the record-keeping and reporting requirements associated with accounting for payroll include (a) maintenance of timecards, (b) maintenance of a payroll register, (c) maintenance of individual employee payroll records, (d) preparation of IRS Form 941 and the state equivalent on a quarterly basis, (e) preparation of IRS Form 940 and the state equivalent, (f) preparation of IRS Form W-2, and (g) preparation of federal and state unemployment insurance reports.<sup>7</sup> Failure to comply with the payroll reporting and deposit requirements, whether due to negligence or ignorance, can result in substantial penalties and fines. Even if the client does not, at present, have employees, the likelihood of having employees in the near future should be discussed and considered.

#### Design Options

While it is recognized that an infinite number of accounting system design options could be offered, five basic design options are incorporated into the model. A discussion of each follows.

1. *Modified accounting system totally administered by the client (B-1).* "Modified accounting system" implies the design of a simplified system—one that would accommodate the preparation of the client's tax return at year-end and provide managerial information sufficient to the client's needs and

<sup>7</sup>K. D. Larson and W. W. Pyle, *Fundamental Accounting Principles*, 11th ed. (Homewood, Illinois: Irwin Publishing Company, 1987), pp. 452-464.

ability to understand, and require no outside accounting assistance.<sup>8</sup> A "modified" system may not consist of a complete set of journals and ledgers and thus may not be in strict compliance with generally accepted accounting principles. The B-1 design option is appropriate in the most simple business settings. Such a system may be comprised of simply a Cash Receipts Journal and a Cash Payments Journal. If credit is extended to customers, an Accounts Receivable subsidiary ledger would be required. If merchandise and/or supplies are purchased on account from a number of suppliers, an Accounts Payable subsidiary ledger may be required. In most instances, these additional chores could be handled by the entrepreneur as well, depending on the number of transactions involved.

An alternative to the design of special journals is the Matrix Accounting Information System.<sup>9</sup> This system was specifically designed for small, low-volume business settings. While a complete discussion of the Matrix Accounting Information System is beyond the scope of this article, some of its attributes merit comment. The system involves the monthly preparation of a matrix of accounts, with account titles serving as headings for both columns and rows. This matrix could require as little as one page per month, while simultaneously deleting the need for journals or ledgers. This system reduces accounting chores significantly by reducing the work associated with recording transactions and totally eliminating the posting of journal transactions to ledger accounts. In short, the Matrix Accounting Information System serves as one example of a

<sup>8</sup>It should be noted that "outside assistance" refers to outside assistance with routine record-keeping chores. It is assumed that all proprietors will obtain assistance in the preparation of year-end tax returns and formal financial statements, should they be required by creditors and/or lending institutions.

<sup>9</sup>Stephen A. Moscovice and Mark G. Simkin, *Accounting Information Systems*, 3rd ed. (New York: John Wiley & Sons, Inc., 1987), pp. 182-186.

ready-made “B-1” design option, practical for those organizations having a low volume of financial transactions. It is important to remember that the model does not make decisions for the consultant or the client, nor does it prescribe a specific accounting system design.

2. *Modified accounting system, partially administered by the client (B-2).* The conditions associated with this situation would allow the entrepreneur to perform most of the routine record-keeping chores, yet some aspects of the accounting system are beyond the capabilities of the client, or the time requirements associated with administering the total accounting system exceed the amount of time available in the client’s schedule. For example, it may be advisable to have payroll and all of the payroll-related reporting requirements (mentioned earlier) handled by an external accounting service. Obtaining an outside accounting service to perform these functions is both cost-effective and time-saving for the vast majority of small-business owners intent on keeping the records of their organization themselves. The components of a B-2 system may be identical to those mentioned in the above section (B-1 option), the only difference being that some of the record-keeping requirements are performed by an accounting service external to the organization.

3. *Complete, double-entry record keeping system, totally administered by client (B-3).* A “complete, double-entry” record keeping system is premised on the basic accounting equation:

$$\text{Assets} = \text{Liabilities} + \text{Owner's Equity}.$$

The mechanics of such a system require that (a) every business transaction be recorded in two or more accounts and (b) that debits always equal credits (thus insuring that the equation always remains in balance).<sup>10</sup> As a minimum,

<sup>10</sup>Kermit D. Larson and William W. Pyle, *Fundamental Accounting Principles*, 11th ed. (Homewood, Illinois: Irwin Publishing Company, 1987), pp. 48-49.

a double-entry system requires a General Journal for the recording of business transactions, and a General Ledger of accounts. Specific journals, such as a Cash Receipts Journal, a Cash Disbursements Journal, a Purchases Journal, and/or a Sales Journal, may be added, depending on the requirements and conditions of the business setting. Also, subsidiary ledgers, such as a Subsidiary Ledger of Accounts Receivable, may be required as well. Maintaining a double-entry accounting system is significantly more complicated than less sophisticated options, and thus requires more time and knowledge to administer.

The B-3 design option is recommended in situations where (a) the client has a great deal of time flexibility, (b) the client has sufficient knowledge and/or experience to administer a double-entry accounting system, complete with adjusting and closing entries, and (c) the level of complexity within the business setting is relatively low. With respect to knowledge and/or experience, the client must be familiar with the various steps included in the accounting cycle, which include: (1) recording (or journalizing) transactions, (2) posting the recorded amounts, (3) preparing a trial balance, (4) preparing a work sheet, (5) preparing the financial statements, (6) preparing and posting adjusting and closing entries, and (7) preparing a post-closing trial balance. As noted earlier, it is assumed that, even at this level of client expertise, the client would not prepare formal financial statements. However, the recording and posting functions would be carried out by the client for his or her business enterprise. It is anticipated that this option would be selected only rarely.

4. *Complete, double-entry record keeping system, partially administered by client (B-4).* The situational conditions resulting in a recommendation of the B-4 design option are similar to those mentioned for the B-3 design

option. However, due to the increased complexity of the business setting, the need for outside accounting assistance is greater. Conditions that increase the complexity of the business setting include the presence of employees or a corporate organizational structure. In corporations, the management of the firm must be treated as employees, due to the separate, legal entity status of corporations. This is why a "No" response to Question 3 of the model leads the consultant directly to "Recommended Design Options." Once again, accounting for payroll (and filing the related reports) serves as an example of the type service that should be obtained from a professional accounting service.

5. *Referral (R-1)*. This is actually a non-accounting design option, in that no accounting system is designed. The client either has insufficient time to devote to accounting, has insufficient education and/or experience, or the complexity of the business setting is too great. The specific recommendation is for the client to identify a CPA or other competent accounting authority to design and administer the accounting system. The consultant should then become involved in helping the client identify a "competent accounting authority." Selection of this option by the consultant represents a denial of the original request by the client and thus should be handled with tact.

#### **Model Testing**

The model was field-tested during the period October, 1985 through December, 1987 by consultants of the SBDC at Southwest Missouri State University. Five consultants applied the model in 332 different cases involving business owners who were seeking assistance in the design of an accounting system that they could personally administer. Each consultant reported that the model was extremely useful in helping to structure their approach. No "consultation failures"

were reported when the model was applied.

#### **DISCUSSION**

The model has a number of limitations that should be noted. As was mentioned earlier, the model does not include some aspects related to the complexity of the business setting that may affect the design of the accounting system, such as the number of business transactions and the type of organization involved (service, retail, or manufacturer). In addition, the issue of "computers" could be included in the model. That is, does the client own or have access to a personal computer, and if so, is the client skilled in its use? A client with severe time limitations may be capable of maintaining business records if a computer is available. The proposed model was developed with a client base dominated by clients in the pre-venture stage of development and proved to be quite sufficient for this type of client. However, future versions of the model should include additional factors.

It should be noted that the model is not intended as an instrument to be applied in the client's presence, but rather as a guide for structuring the dialogue between client and consultant. Ideally, the consultant will internalize the model, and gather the data necessary for determining the appropriate design option without the client knowing that a model, per se, is being employed. For example, whether or not the client has sufficient education and/or experience to successfully administer a record-keeping system has to be the decision of the consultant, not the client. The information necessary to make determinations may require numerous questions, not a cursory, "Do you have any accounting education or experience?" or "Do you have open time in your schedule?" followed by a simple "Yes" or "No." The con-



sultant may need to "cycle" through the model a number of times, as more data become available with respect to the education/experience level of the client and the complexity of the business setting.

#### CONCLUSION

In summary, two points merit review: (1) The model was designed to assist, not replace, the consultant. The consultant is the decision-maker and, as such, must take full responsibility for

the decisions and advice rendered. (2) The model should be applied by a consultant with extensive accounting knowledge and experience, as successful application of the model requires a significant amount of professional judgment on the part of the consultant. Thoughtfully applied by an experienced professional, the model can help consultants to provide better assistance and advice to inexperienced entrepreneurs, thereby increasing their chances for business success.

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## NEW BOOKS FOR REVIEW\*

- *Developing Business Strategies*, David A. Aaker, John Wiley and Sons, Inc., New York, 1988, 364 pp.
- *Make It Yours! How To Own Your Own Business*, Louis Mucciolo, John Wiley and Sons, Inc., New York, 1987, 269 pp.
- *Avoiding the Pitfalls of Starting Your Own Business*, Jeffrey D. Davidson, Walker and Company, New York, 1988, 240 pp.
- *Keeping the Family Business Healthy*, John L. Ward, Jossey-Bass Inc., San Francisco, 1987, 266 pp.
- *The Arthur Young Business Plan Guide*, Eric Siegel, Loren Schultz, Brian Ford and David Carney, John Wiley and Sons, Inc., New York, 1987, 184 pp.
- *The Business Planning Guide: Creating a Plan for Success in Your Own Business*, David H. Bangs, Jr., Upstart Publishing Company, Inc., Dover, New Hampshire, 1988, 143 pp.
- *Managing the Marketing Functions: The Challenge of Customer-Centered Enterprise*, Stewart A. Washburn, McGraw-Hill, New York, 1988, 371 pp.
- *Up-Front Financing: The Entrepreneur's Guide*, A. David Silver, John Wiley & Sons, Inc., New York, 1988, 238 pp.
- *Entrepreneurial Finance: Taking Control of Your Financial Decision Making*, Robert Ronstadt, Lord Publishing, Inc., Natick, Massachusetts, 1988, 219 pp.

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