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Computer-Based Financial Management System for a Small Business

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As profits decline and competition increases, small businesses find computer technology increasingly necessary. But small businesses aren't too well versed in the art. Here's what they might do—

A COMPUTER-BASED FINANCIAL MANAGEMENT SYSTEM FOR SMALL BUSINESS

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HOW CAN the small businessman survive in today's world of greater competition, narrower profit margins, and increasing volumes of work? While his giant competitors have relied more and more upon the computer for survival, the small businessman has virtually ignored the capabilities of computer technology. This has made it exceedingly difficult for him to develop the information necessary for effective planning and control; information vital for survival in today's world.

The purpose of this article is to present a computer-based financial management system which can be tailored to meet the needs of any small business. It is the authors' contention that more accurate information for decision-making through computer-based management systems will greatly contribute to the health and growth of

small business. The objectives of this system are: (1) to perform routine accounting functions at a reasonable cost; (2) to improve long-run growth prospects through efficient resource allocation; and (3) to improve the financial position and profitability of a firm.

System overview

The system is a *small business information system* and is called SMALBIS. SMALBIS is comprised of two subsystems: the planning subsystem and the reporting subsystem. Both subsystems rest conceptually upon the foundation of matrix accounting, a technique which reduces the need for the traditional double entry method of accounting. It is the authors' belief that matrix accounting significantly reduces the amount of work re-

quired to generate input data for a planning model and the workload required to collect and process accounting data. The matrix concept is used to illustrate the financial data base of the system in Exhibit 1, page 21.

Each cell in the matrix represents an account or item included in the data base. From Exhibit 1 it can be observed that any cell in the matrix is accessible by virtue of a column and row address. This permits the financial data base to be randomly updated, and puts a wealth of financial information at the fingertips of the manager.

The financial data base contains information which can produce the following statements: income statement, balance sheet, funds statement, and budget statement. In addition, a statement of financial analysis (significant financial ratios)

can be produced. These statements, or any portion thereof, can be produced periodically or upon demand through a terminal or via batch processing.

The data base can be used in two modes: the planning or simulation mode, and the accounting system mode. In the planning mode, the user inputs data which represents his judgment as to what future transactions will be (or should be) over the next fiscal year. These transactions working in conjunction with the data base will produce proforma financial statements. After a number of iterations, when the user is satisfied with the proforma statements, the data on the proforma statements is used as input to the data base as the forecasted values for the ensuing fiscal year.

In the accounting system mode, the matrix serves as the repository for accounting data. The data base is updated with transactions periodically and at the end of each period (or upon demand), financial statements are produced (income, balance sheet, funds, budget, financial analysis) which reflect: the period's data, year-to-date data, last year's comparable data, and the forecasted data. This is true for each item on every statement. Thus, the matrix takes on several new dimensions to reflect the different amounts carried for each account and item. This concept appears in Exhibit 2, this page.

The foundation of the system is a bridge which links the data base to the routine transactions of the firm. The bridge is built by defining the routine transactions, assigning a code to them, and developing a decision table which relates each transaction to the appropriate cells in the matrix. The decision-table is the heart of the system as it maps transactions to the data base. This concept appears in Exhibit 3, page 22.

With this decision-table, all the user need do in either mode, is to enter the appropriate transaction code and the amount of the transaction. The decision-table will specify what accounts are to be up-
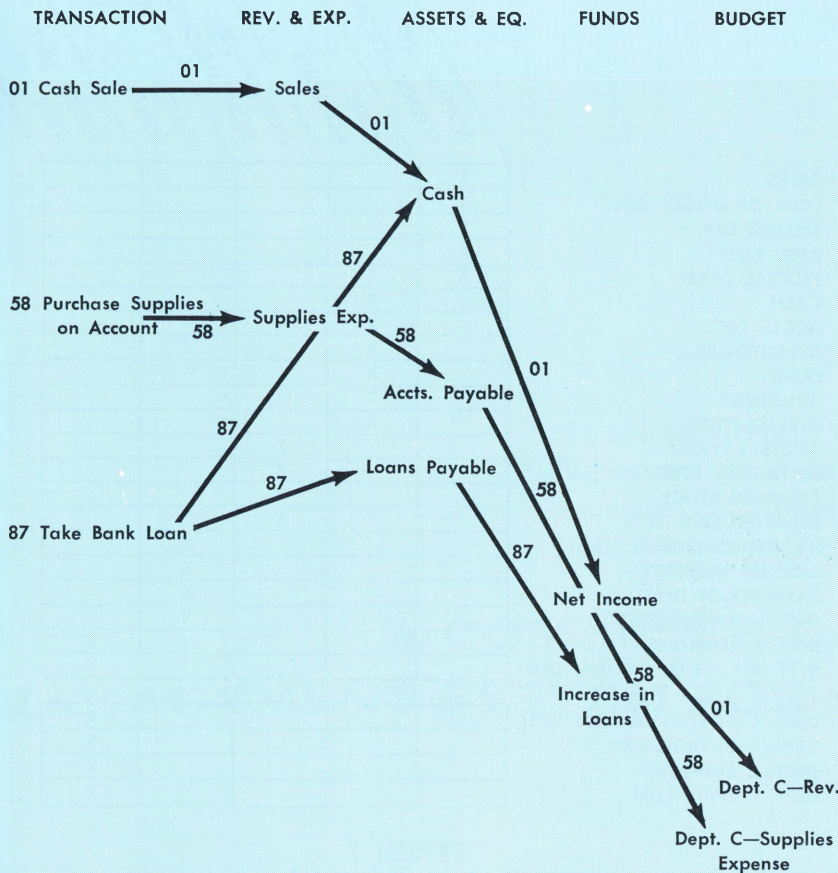
EXHIBIT I
Matrix Data Base Concept

	REVENUE AND EXPENSE ACCOUNTS	ASSET ACCOUNTS	LIABILITY AND EQUITY ACCOUNTS	FUND ITEMS	BUDGET UNIT ITEMS
SALES	X				
COST OF GOODS SOLD	X				
SELLING EXP.	X				
ADM. EXP.	X				
FEDERAL TAXES	X				
CASH		X			
ACCTS. REC.		X			
INVENTORIES		X			
LAND		X			
BUILDINGS		X			
DEPRECIATION		X			
ACCTS. PAYABLE			X		
LONG-TERM DEBT			X		
COMMON STOCK			X		
RETAINED EARNINGS			X		
INC. IN LONG-TERM DEBT				X	
SALE OF PROPERTY				X	
PAYMENT OF DEBT				X	
INC. IN INVENTORIES				X	
DEPT. A REVENUES					X
DEPT. A COST OF GOODS SOLD					X
DEPT. C COST OF GOODS SOLD					X
DEPT. C PAYROLL EXP.					X
DEPT. C SUPPLIES					X
DEPT. C EQUIPMENT					X

EXHIBIT 2
Expanded Matrix Data Base Concept

FORECASTED DATA
LAST YEAR'S DATA
THIS YEAR'S DATA

REV. & EXP. ACCTS. / ASSET ACCTS. / LIABILITY AND EQUITY ACCTS. / FUND ITEMS / BUDGET ITEMS

SALES
COST OF GOODS SOLD
SELLING EXP.
ADM. EXP.
FED. TAXES
CASH
ACCTS. REC.
INVENTORIES
LAND
BUILDINGS
DEPRECIATION
ACCTS. PAY.
LONG-TERM DEBT
COMMON STOCK
RETAINED EARNINGS
INC. IN LONG-TERM DEBT
SALE OF PROPERTY
PAYMENT OF DEBT
INC. IN INVENTORIES

DEPT. C REVENUES
DEPT. C COST OF GOODS SOLD
DEPT. C PAYROLL EXP.
DEPT. C SUPPLIES
DEPT. C EQUIPMENT

EXHIBIT 3

Transaction—Data Base Bridge

TRANSACTION	REV. & EXP.	ASSETS & EQ.	FUNDS	BUDGET

01 Cash Sale → 01 → Sales

01 → Cash

87 →

58 Purchase Supplies on Account → 58 → Supplies Exp.

58 → Accts. Payable

87 →

87 Take Bank Loan → 87 → Loans Payable

01 → Net Income

58 →

87 →

58 → Increase in Loans

01 → Dept. C—Rev.

58 → Dept. C—Supplies Expense

EXHIBIT 4

Proforma Income Statement

Knox Manufacturing Co.
December 31, 1974

	Projected
Gross Sales	$3,300,000
Sales Returns and Allowances	$ 130,000
Sales Discounts	$ 160,000
Net Sales	$2,910,000
Cost of Goods Sold	$1,000,000
Gross Profit	$1,910,000
Expenses	
Selling	$ 915,000
Administration	$ 530,000
Depreciation	$ 120,000
Total Expenses	$1,565,000
Net Operating Profit	$ 345,000
Other Expenses:	
Interest	$ 15,000
Net Income Before Taxes	$3,300,000
Federal Income Taxes	$ 165,000
Net Income After Taxes	$ 165,000

dated and whether the account is to be increased or decreased. Thus, only two pieces of data are necessary to update the data base, although for accounting purposes a transaction date and reference will also be needed.

The financial management system is generalized because virtually any firm can use the system without the necessity of altering its transaction codes or chart of accounts. The series of tables built into the software will relate the unique characteristics of any firm to the logic of the system.

Case study

A case study will be presented to illustrate the fundamental concepts of the system. The case study centers on a hypothetical company, the Knox Manufacturing Company. Knox Manufacturing, a small company with sales of approximately $3,000,000, would like to computerize its accounting system and desires to incorporate some financial planning techniques into its management process. Knox decides to use SMALBIS and the steps required to implement the system follow:

1. Build the financial data base.

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2. Define the routine accounting transactions.
3. Complete the decision tables which relate the transactions to the data base.
4. Use the system in the planning mode.
5. Use the system in the operating mode.

Build financial data base—In order to use the system in either mode, the user must first convert his accounting files to the data base format of the system. This is accomplished by completing specialized forms designed for this purpose.

Define routine accounting transactions—The user defines the accounting transactions which form the nucleus of all transactions. These are the transactions which can be anticipated in advance (except for amount), i.e., cash sale, payment on account, purchases on account. Ninety to ninety-five per cent of all transactions should fall into this category. Other transactions are treated as exceptions which are handled by the system in the normal double entry method.

Complete decision tables—The routine transactions are assigned a code and entered on a transaction definition form. This form relates each transaction to specific accounts and also specifies the logic required for each transaction. For example, a cash sale would debit cash, credit sales, add to the net income account in the funds file, and add into the revenue account in the budget file.

Use system in planning mode—Knox management creates forecasted transactions for 1974 and inputs them to the system. Proforma statements (balance sheet, income statement, funds statement, and statement of financial analysis) are produced which management analyzes. This process is repeated until management is satisfied with the projected values on the statements. The final set of statements represents the "picture" of the company which management would like to have at the end of 1974. The proforma income statement and

EXHIBIT 5

Proforma Statement of Financial Analysis

Knox Manufacturing Co.
December 31, 1974

	Projected
Current Ratio	2.40
Quick Ratio	1.20
Leverage	0.50
Times Interest Earned	15.00
Inventory Turnover	4.40
Average Collection Period	48 Days
Fixed Asset Turnover	1.46
Profit Margin	0.50
Return on Assets	0.03%
Return on Net Worth	0.09%
Earnings Per Share	5.10
Book Value Per Share	33.39

EXHIBIT 6

Transaction Register
(Debit Record)

Knox Manufacturing Co.

31-12-72

Account Number	Tran. Code	Ref.	Date	Budget Unit	Amount	Explanation
199302	0	SL001	12-01	0	50,000.00	Pur. Treas. Stock
110620	1	SJ001	12-03	300107	140,000.00	Cash Sale
112740	2	SJ002	12-03	300107	40,000.00	Credit Sale
110620	3	CR001	12-07	0	50,000.00	Receive Paymnt. on Ac.
143108	4	CJ009	12-09	0	100,000.00	Purch. Raw Materials
64133	6	GJ001	12-11	0	1,000.00	Decr. Prepd. Expenses
24891	7	GJ002	12-12	0	324,000.00	Cost of Goods Sold
190016	12	CJ010	12-12	0	5,000.00	Inc. Insurance Depos.
110620	17	CR002	12-15	0	50,000.00	Sell Buildings
192411	18	CJ011	12-15	0	20,000.00	Purchase Equipment
64133	22	GJ003	12-16	0	10,000.00	Depreciation Charge
194506	23	CJ012	12-16	0	5,000.00	Inc. Deferred Charges
110620	1	SJ003	12-16	300107	20,000.00	Cash Sale
110620	1	SJ003	12-18	336212	150,000.00	Cash Sale
110620	1	SJ004	12-18	352207	170,000.00	Cash Sale
112740	2	SJ005	12-19	300107	20,000.00	Credit Sale
112740	2	SJ006	12-19	336212	50,000.00	Credit Sale
112740	2	SJ007	12-20	352207	70,000.00	Credit Sale
110620	25	CR003	12-20	0	20,000.00	Inc. Notes Payable
196307	27	CJ013	12-22	0	40,000.00	Make Payment on Acct.
110620	30	CR004	12-22	0	50,000.00	Finance with Bonds
65820	32	CJ014	12-23	0	6,000.00	Interest Expense
41160	36	CJ001	12-23	300107	17,000.00	Payroll Expense
41160	36	CJ002	12-23	336212	16,000.00	Payroll Expense
41160	36	CJ003	12-25	352207	18,000.00	Payroll Expense
64133	37	CJ004	12-25	300107	5,000.00	Supplies Expense
64133	37	CJ005	12-27	336212	4,000.00	Supplies Expense
64133	37	CJ006	12-27	352207	3,000.00	Supplies Expense
64133	38	CJ007	12-28	300107	5,000.00	Equipment Expense
64133	38	CJ008	12-29	336212	2,000.00	Equipment Expense
64133	38	CJ008	12-29	352207	2,000.00	Equipment Expense
84163	40	CJ015	12-30	0	40,000.00	Pay Common Dividend
34176	41	CJ009	12-30	352207	5,000.00	Selling Expenses

Total = 1,508,000.00

statement of financial analysis appear in Exhibits 4 and 5, pages 22 and 23.

The entire set of proforma statements represents the financial planning strategies of the company and

budgets are then produced as the vehicle for implementing the plans. The 12 month projected data is broken down on a month-by-month basis and each month's forecasted value is used as input to the data

EXHIBIT 7

Income Statement

Knox Manufacturing Co.
December 31, 1974

	Last Year		Actual		Projected	
	Month	Yr.-to-Date	Month	Yr.-to-Date	Month	Yr.-to-Date
Gross Sales	$250,000.00	$3,250,000.00	$300,000.00	$3,400,000.00	$300,000.00	$3,300,000.00
Sales Returns and Allowances	$ 1,910.00	$ 130,000.00	$ 2,000.00	$ 130,000.00	$ 3,000.00	$ 130,000.00
Sales Discounts	$ 90.00	$ 86,000.00	$ 200.00	$ 110,000.00	$ 300.00	$ 160,000.00
Net Sales	$248,000.00	$3,036,000.00	$297,800.00	$3,160,000.00	$296,700.00	$2,910,000.00
Cost of Goods Sold	$116,000.00	$ 825,000.00	$160,000.00	$ 900,000.00	$190,000.00	$1,000,000.00
Gross Profit	$132,000.00	$2,211,000.00	$137,800.00	$2,260,000.00	$106,700.00	$1,910,000.00
Expenses						
Selling	$ 66,000.00	$1,002,760.00	$ 64,400.00	$ 996,000.00	$ 43,650.00	$ 915,000.00
Administration	$ 30,150.00	$ 770,800.00	$ 32,400.00	$ 690,000.00	$ 22,050.00	$ 530,000.00
Depreciation	$ 10,000.00	$ 120,000.00	$ 10,000.00	$ 120,000.00	$ 10,000.00	$ 120,000.00
Total Expenses	$106,150.00	$1,893,560.00	$106,800.00	$1,806,000.00	$ 75,700.00	$1,565,000.00
Net Operating Profit	$ 25,850.00	$ 317,440.00	$ 31,000.00	$ 354,000.00	$ 31,000.00	$ 345,000.00
Other Expenses:						
Interest	$ 850.00	$ 10,240.00	$ 1,000.00	$ 14,000.00	$ 1,000.00	$ 15,000.00
Net Income Before Taxes	$ 25,000.00	$ 307,200.00	$ 30,000.00	$ 340,000.00	$ 30,000.00	$ 330,000.00
Federal Income Taxes	$ 12,500.00	$ 153,600.00	$ 15,000.00	$ 170,000.00	$ 15,000.00	$ 165,000.00
Net Income After Taxes	$ 12,500.00	$ 153,600.00	$ 15,000.00	$ 170,000.00	$ 15,000.00	$ 165,000.00

base along with the approved budget.

Use system in accounting system mode—Knox enters its normal operating cycle for 1974. At the end of each period, financial statements are produced which show period, year-to-date, comparable last year and forecasted data. In addition, a transaction register (Exhibit 6, page 23) and a general ledger are produced as an audit trail.

The income statement and statement of financial analysis produced at the year's end are shown in Exhibits 7 and 8, both of which appear on this page.

The information on the entire set of financial statements is indispensable for control purposes. At the end of each month (or upon demand), management can measure projected data, actual data, and last year's data. If management feels current performance is not meeting expectations, it can take the necessary corrective action to put the company back on course.

Summary

The financial management system known as SMALBIS generates financial information heretofore unavailable to small businesses. This information is accurate and timely and is delivered at a reasonable cost. With a wealth of information he has never had before, the small businessman will be in a better competitive position because he can manage his business more efficiently.

The financial management system presented in this article is easily adapted to virtually any small business. Ideally, a service bureau would offer this system and small businesses would contract with the service bureau for the use of the system. Thus, any small business could have the tools of financial planning previously only in the domain of big business. These tools in concert with the reasonably-priced accounting system will provide the information vital to survival in today's business world.

EXHIBIT 8

Statement of Financial Analysis

Knox Manufacturing Co.
Statement of Financial Analysis
December 31, 1974 .

	Last Year	Actual	Projected
Current Ratio	1.70	2.00	2.40
Quick Ratio	0.80	1.00	1.20
Leverage	0.50	0.50	0.50
Times Interest Earned	14.71	15.00	15.00
Inventory Turnover	4.50	4.60	4.40
Average Collection Period	45 Days	45 Days	48 Days
Fixed Asset Turnover	1.65	1.50	1.46
Profit Margin	0.05	0.05	0.05
Return on Assets	0.04%	0.03%	0.03%
Return on Net Worth	0.08%	0.07%	0.09%
Earnings Per Share	4.79	4.75	5.10
Book Value Per Share	32.19	33.10	33.39