



COMPUTERIZATION OF THE ACCOUNTING SYSTEM
FOR VISION TECHNOLOGY CO., LTD.

by

Mr. Jirasak Traisophonsirikul

A Final Report of the Three-Credit Course
CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

November 2002

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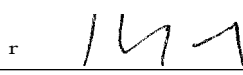
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Academic Year	November 2002

The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

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ABSTRACT

This project is initiated by the financial manager of Vision Technology Co., Ltd. who wishes to convert the accounting system from manual process to computer-based process. The problems with manual system have slow processes, duplication of work, data entry errors, and time-consuming financial reports.

The scope of the project is to computerize general ledger system. Since the company does not have the internal programming staff to design its own system and due to the fact that this kind of application is common to all business organizations, a vendor-supplied software package is the best solution. Some of the important criteria for acquiring an appropriate general ledger (GL) software package include cost, compatibility, ease of use, flexibility, vendor support, training, maintenance, program updates, vendor stability, available related software packages and accounting standard compliance.

The decision has been made to purchase GENEUS GL software package. The software has been installed on the existing PC and run parallel to the manual system. The new computerized system is considered to perform satisfactorily on achieving specified goals with the result that the new system will hopefully enhance the user job performance and the organizational performance as a whole.

ACKNOWLEDGEMENTS

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I. INTRODUCTION

1.1 Background of the Organization

Vision Technology Co., Ltd. is a one hundred percent Thai owned company founded in 1982. They import CCTV (Closed Circuit Television) equipments and radio transceivers from various suppliers. Most of the sales are made by direct selling through their own sales staff and also by bidding to governmental offices and state enterprises. The target group of customers covers various types of businesses, such as oil refinery, heavy industry manufacturing, consumer goods factory, banking, high-rised building, governmental office and state enterprise, etc.

The company divides the organization into two groups, i.e. CCTV group and radio transceiver group. Each group has its own profit center. This means each group has its own sales staff and technical staff. The accounting and financing department is centralized and works for both group. They prepare Income Statement for each individual group and then prepare consolidated Income Statement and Balance Sheet. All of these procedures are done manually from the recording of daily transactions to the posting to the ledger until the preparation of financial statements.

There are currently two accounting staff doing all the accounting job from recording daily transactions, posting to the ledger and preparing financial statements. They close the books and prepare financial statements on a monthly basis. The situation reveals that it normally takes almost two months to complete the monthly closing process. For example, the financial statements for the month of January will be completed around the end of March. This situation is unacceptable and the management would like to solve the problem. At first they have suggested to increase one more accounting staff. But the financial manager proposed to use computerized

system to replace the current manual system. The management agreed and asked the financial manager to conduct the feasibility study of the computerized system.

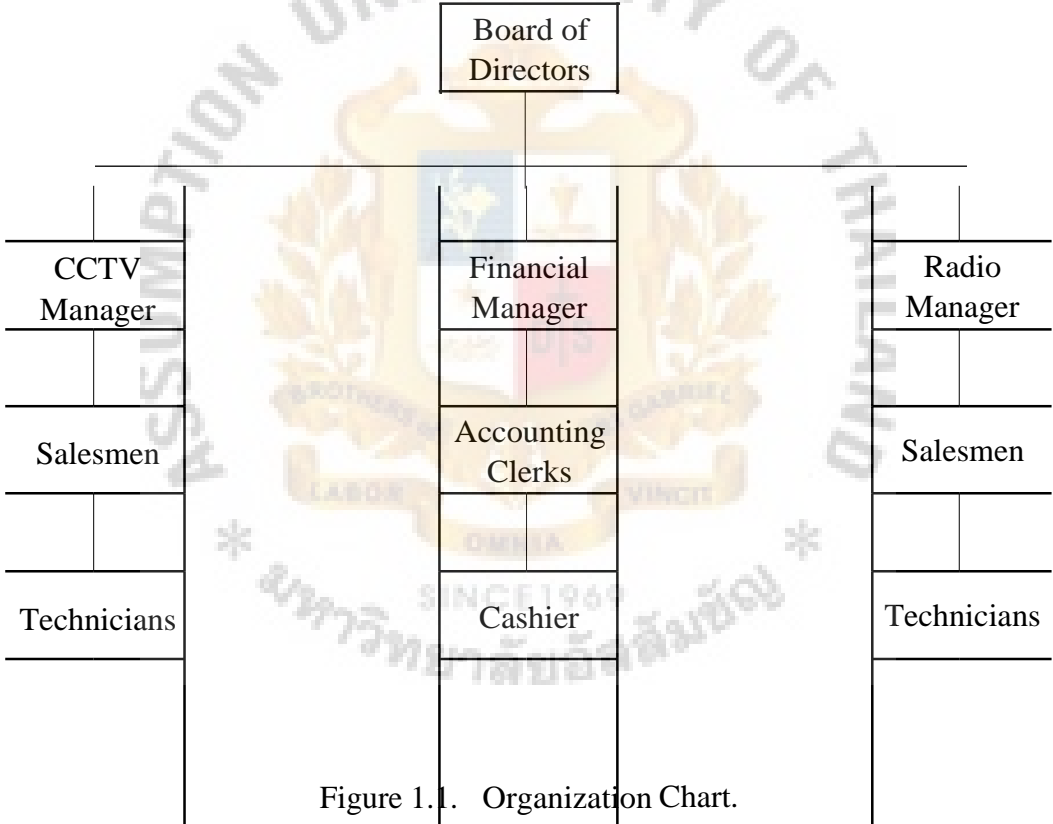


Figure 1.1. Organization Chart.

1.2 Significance of the Project

Accounting system is one of the transaction processing system (TPS) that serves the operational level of the organization. It performs and records the daily, routine transactions necessary to conduct the business. Data about each transaction are captured and stored for later aggregation. Reports may be produced immediately or at specified periods to provide standard summarizations of transactions, and transactions may be moved from process to process in order to handle all aspects of the business activity. The goal of system development is to improve transaction processing by speeding it up, using few people, improving efficiency and accuracy, and providing information not previously available.

The general ledger system, which is part of the accounting system, is responsible for maintaining records of the firm's income and expenses and for producing financial reports such as income statement and balance sheet. These reports play an important role in a firm's financial success. The management uses financial statements to analyze the condition of a firm and to plan for its future. The income statement is like a video. It measures a firm's profitability over a period of time. The firm can choose the length of the reporting time period. It can be a month, a quarter, or a year. The income statement shows revenue, expenses, and income. Revenues represent gross income the firm earned during a particular period of time (usually from sales). Expenses represent the cost of providing goods and services during a given period of time. Net income is what is left after expenses are subtracted from revenues.

If the income statement is like a video, a balance sheet is like a still photograph. The balance sheet shows the firm's assets, liabilities, and equity at a given point in time. This snapshot of a company's financial position tells us nothing about the firm's

financial position before or after that point in time. On the balance sheet, the firm's assets are listed in order of their liquidity. Liquidity is the ease with which you can convert an asset to cash. This means that cash and near-cash assets called current assets are listed first. Assets that are difficult to convert to cash are listed later. On the other side of the balance sheet, the liabilities that are due earliest, current liabilities, are listed first. Current liabilities are almost always due within one year. The liabilities due later, such as long-term debt, are listed later on the balance sheet. The equity section lists the claims of the owners. The owners' claims include both the amount the owners contributed when the common stock was first issued, and the total earnings retained by the firm at the time of the balance sheet. (Gallagher and Andrew, Jr. 2000)

1.3 Objectives of the Project

Systems development projects are undertaken for two primary reasons: to take advantage of business opportunities or to solve business problems. Taking advantage of an opportunity might occur by providing an innovative service to customers through the creation of a new system. Solving a business problem could occur by modifying the way in which an existing system processes data so that more accurate or timely information is provided to users. (Hoffer, George and Valacich 1999)

The primary objective of this project is to solve the problem of the accounting function by converting the manual system to computerized system. The computerized system is expected to help the accounting staff do their jobs more efficiently and more effectively by automating routine tasks so that the duplication of data processing can be eliminated and more accurate and timely financial statements can be provided easily. The cost to develop a new system should be minimal and within the set budget of 10,000 Bahts. In order to save the investment cost as well as to better utilize the

existing resources the new system should also be able to integrate with the existing hardware and operating software.

1.4 Scope of the Project

The scope of the project is to computerize the general ledger system. The project's scope is determined by these factors:

- (1) The defined project will attain its desired objective by solving the problem of the slow process of closing accounting books and providing more timely financial statements.
- (2) The general ledger system is the basic system that should be put in place first. Once the basic system is in place, additional modules can be added easily as needed in future.
- (3) Since the users are not familiar with the application area it is too risky to conduct the whole accounting systems, such as inventory control system, accounts receivable system, accounts payable system, etc., altogether at the same time. Given that larger projects are technically riskier than small projects, the company cannot afford to have too many of these.
- (4) If we conduct the whole accounting systems which are very complex, implementation will take a long time to complete or it may not be completed at all.
- (5) The defined project is feasible to meet the budget limit. Any larger project is not likely to do so. For the given situation the most appropriate approach to acquiring the new system is to purchase a pre-written package.

II. LITERATURE REVIEW

2.1 Overview

The analysis and design of computer-based information systems began in the 1950s. Since then, the development environment has changed dramatically, driven by organizational needs as well as by rapid changes in the technological capabilities of computers. In the 50s, the focus of the development effort was on the processes the software performed. Computers were large, expensive, and not very reliable. All applications had to be developed in machine language or assembly language, and they had to be developed from scratch, as there was no software industry.

But the 60s saw important breakthroughs in technology that enabled the development of smaller, faster, less expensive computers (mini-computers) and the beginnings of the software industry. Most organizations still developed their applications from scratch, using their in-house development staffs. System development was more of an art than a science. This view of systems development began to change in the 1970s, however, as organizations began to realize how expensive it was to develop customized information systems for every application. Systems development came to be more disciplined as many people worked to make it more like engineering.

The 1980s were also marked by major breakthrough in computing in organizations, as microcomputers became key organizational tools. The software industry expanded greatly as more and more people began to write off-the-shelf software for microcomputers. Organizations developed less software in-house and bought relatively more from software vendors.

The growth of the software industry has been phenomenal since its beginnings in the mid - 1960s. Now, some of the largest computer companies in the world, as measured by the Datamation 100, are companies that produce software exclusively (see Table 2.1). Consulting firms, such as American Management Systems and Andersen Consulting, also rank in the top 40 packaged software producers.

Table 2.1. The Top 10 U.S. Software Companies in the 1996 Datamation 100.

Rank among Software Companies	Company	Revenues from Software, 1996
1	IBM	\$ 12,911
2	Microsoft	9,435
3	Hitachi	5,487
4	Fujitsu	4,755
5	Computer Associates	3,157
6	NEC	2,310
7	Oracle	2,280
8	SAP	1,700
9	Novell	1,225
10	Digital	1,225

Notes: Revenue in millions

Adapted from Datamation, July 1997

Software companies develop what are sometimes called prepackaged or off-the-shelf systems. The packaged software development industry serves many market segments. Their software offerings range from general, broad-based packages, such as general ledger, to very narrow, niche packages, such as software to help manage a day care center. Software companies develop software to run on many different computer platforms, from microcomputers to large mainframes. The companies range in size from just a few people to thousands of employees. Software companies consult with system users after the initial software design has been completed and an early version of the system has been built. The systems are then beta-tested in actual organizations to determine whether there are any problems with the software or if any improvements can be made. Until testing is completed, the system is not offered for sale to the public. Unfortunately, the software is sometimes put on the market before it is ready. (Hoffer, George and Valacich 1999)

An application software package is a set of prewritten, precoded application software programs that are commercially available for sale or lease. Application software packages may range from a simple task (e.g., printing address labels from a database on a PC) to more than 400 program modules with 500,000 lines of code for a complex mainframe system.

Packages have flourished because there are many applications that are common to all business organizations, for example, payroll, accounts receivable, general ledger, or inventory control. For such universal functions with standard procedures, a generalized system will fulfill the requirements of many organizations.

Table 2.2. Examples of Application Software Packages.

Accounts receivable	Job costing
Accounts payable	Library systems
Bond and stock management	Life insurance
Computer-aided design (CAD)	Mailing labels
Document imaging	Order processing
E - mail	Payroll
General ledger	Process control
Groupware	Purchase order
Healthcare	Sales analysis
Hotel management	Tax accounting
Internet telephone	Web browser
Inventory control	Word processing

When an appropriate software package is available, it is often not necessary for a company to write its own programs; the prewritten, predesigned, pretested software package can fulfill most of the requirements and can be substituted instead. The package vendor has already done most of the design, programming, and testing, so the time frame and costs for developing a new system should be considerably reduced. Another advantage is that vendors supply much of the ongoing maintenance and support for the system, supplying enhancements to keep the system in line with ongoing technical and business developments. (Laudon 2000)

2.2 Software Acquisition

From requirements determination, you know what the current system does and you know what the users would like the replacement system to do. Thus, at this point you understand why a replacement system is necessary to fix problems in the current system. Next, you determine how to acquire the replacement system, such as whether the software should be built in-house or whether the software should be bought off-the-shelf.

Once you have decided to purchase off-the-shelf software rather than write some or all of the software for your new system, how do you decide what to buy? There are several criteria to consider, and special criteria may arise with each potential software purchase. The most common criteria are as follows:

- (1) Cost
- (2) Functionality
- (3) Vendor support
- (4) Viability of vendor
- (5) Flexibility
- (6) Documentation
- (7) Response time
- (8) Ease of installation

These criteria are presented in no particular order. The relative importance of the criteria will vary from project to project and from organization to organization. If you had to choose two criteria that would always be among the most important, those two would probably be vendor viability and vendor support. You don't want to get involved with a vendor that might not be in business tomorrow. Similarly, you don't want to

license software from a vendor with a reputation for poor support. How you rank the importance of the remaining criteria will very much depend on the specific situation in which you find yourself.

Cost involves comparing the cost of developing the same system in-house to the cost of purchasing or licensing the software package. You should include a comparison of the cost of purchasing vendor upgrades or annual license fees with the costs you would incur to maintain your own software. Functionality refers to the tasks the software can perform and the mandatory, essential, and desired system features. Can the software package perform all or just some of the tasks your users need? If some, can it perform the necessary core tasks?

Vendor support refers to whether and how much support the vendor can provide. Support occurs in the form of assistance to install the software, to train user and systems staff on the software, and to provide help as problems arise after installation. Related to support is the vendor's viability. You don't want to get stuck with software developed by a vendor that might go out of business soon. This later point should not be minimized. The software industry is quite dynamic, and innovative application software is created by entrepreneurs working from home offices, the classic cottage industry. Such organizations, even with outstanding software, often do not have the resources or business management ability to stay in business very long. Further, competitive moves by major software firms can render the products of smaller firms outdated or incompatible with operating systems. Keeping up with hardware and system software change may be more than a small firm can handle, and good off-the-shelf application software is lost.

Flexibility refers to how easy it is for you, or the vendor, to customize the software. If the software is not very flexible, your users may have to adapt the way they work to fit the software. Are they likely to adapt in this manner? Purchased software can be modified in several ways. Sometimes, the vendor will be willing to make custom changes for you, if you are willing to pay for the redesign and programming. Some vendors design the software for customization. For example, the software may include several different ways of processing data and, at installation time, the customer chooses which to initiate. Also displays and reports may be easily redesigned if these modules are written in a fourth-generation language. Reports, forms, and displays may be easily customized using a process whereby your company name and chosen titles for reports, displays, forms, column headings, etc. are selected from a table of parameters you provide. You may want to employ some of these same customization techniques for in-house developed systems so that the software can be easily adapted for different business units, product lines, or departments.

Documentation includes the user's manual as well as technical documentation. How understandable and up-to-date is the documentation? What is the cost for multiple copies, if required? Response time refers to how long it takes the software package to respond to the user's requests in an interactive session. Another measure of time would be how long it takes the software to complete running a job. Finally, ease of installation is a measure of the difficulty of loading the software and making it operational. (Hoffer, George and Valacich 1999)

Application software packages must be thoroughly evaluated before they can be used as the foundation of a new information system. The most important evaluation criteria are the functions provided by the package, flexibility, user-friendliness,

hardware and software resources, database requirements, installation and maintain effort, documentation, vendor quality, and cost. When a software package solution is selected, the organization no longer has total control over the system design process. At best, packages can meet only 70 percent of most organizations' requirements. If the package cannot adapt to the organization, the organization will have to adapt to the package and change its procedures. (Laudon 2000)

As discussed earlier, the decision to purchase software systems from a vendor and install them directly or to design and implement a system using internal staff are the two extreme possibilities. Probably the difficulties of software acquisition are caused by the nature of software. It is an intangible goods that performs a service. It is difficult to specify, measure, determine costs, estimate installation time, or determine reliability. The major advantages of purchasing a software package are that it is usually less expensive than internal design and it usually takes a shorter length of time to install the system.

Determined by the situation, the acquisition process can be as simple as contacting one vendor and evaluating the products of just that vendor. Or the process may involve the development of a formal request for proposal (RFP). Under specific circumstances the informal process of directly contacting a single vendor may be appropriate. This is the case when the product is unique to that vendor or when the decision has been made previously to deal with a specific vendor for particular types of software. While the more formal procedure of issuing an RFP may be more time consuming, it will often result in a more thorough consideration of the available products.

The availability of new releases of the system when it is improved and the compatibility of the software with both the present hardware and software are essential. With software, the compatibility issue should not simply be limited to the present configuration but should address any restrictions an acquisition may impose in the future. For example, if we are presently considering the acquisition of a general ledger system, we must also investigate how other related packages, such as accounts receivable and inventory control packages, will interface with the general ledger system being considered.

The selection decision is usually made by management using the data and advice provided by information system technicians. The manager responsible for the acquisition of the software must also be allowed to make the decision of which product to acquire. Whenever possible, the users should be involved in the final selection process. Satisfying the needs of the users should be the ultimate objective of the acquisition. Without their participation, this may not be accomplished. (Mensing and Adams 1991)

2.3 System Implementation

System implementation is made up of many activities. The four major activities we are concerned with in this project are installation, documentation, training, and support.

Installation is the process during which the current system is replaced by the new system. This includes conversion of existing data, software, documentation, and work procedures to those consistent with the new system. Users must give up the old ways of doing their jobs, whether manual or automated, and adjust to accomplishing the same tasks with the new system. Four different approaches to installation have emerged over

the years: direct, parallel, single location, and phased. The approach an organization decides to use will depend on the scope and complexity of the change associated with the new system and the organization's risk aversion.

Direct installation is as sudden as the name indicates: the old system is turned off and the new system is turned on. If the new system fails, considerable delay may occur until the old system can again be made operational and business transactions reentered to make the database up-to-date. For these reasons, direct installation can be very risky. Further, direct installation requires a complete installation of the whole system. For a large system, this may mean a long time until the new system can be installed, thus delaying system benefits or even missing the opportunities that motivated the system request. On the other hand, it is the least expensive installation method.

Parallel installation is as riskless as direct installation is risky. Under parallel installation, the old system continues to run alongside the new system until users and management are satisfied that the new system is effectively performing its duties and the old system can be turned off. Since all work is essentially done twice, a parallel installation can be very expensive; running two systems implies employing two staffs to not only operate both systems but also to maintain them.

Single location installation also known as location and pilot installation, is a middle-of-the-road approach compared to direct and parallel installation. Rather than convert all of the organization at once, single location installation involves changing from the current to the new system in only one place or in a series of separate sites over time. The single location may be a branch office, a single factory, or one department, and the actual approach used for installation in that location may be any of the other approaches. As with each of the other approaches (except phased installation), the

whole system is installed; however, some parts of the organization will not get the benefits of the new system until the pilot installation has been completely tested.

Phased installation, also called staged installation, is an incremental approach. Under phased installation, the new system is brought on-line in functional components; different parts of the old and new systems are used in cooperation until the whole new system is installed. Phased installation, like single location installation, is an attempt to limit the organization's exposure to risk, whether in terms of cost or disruption of the business.

Documentation can be divided into two basic types, system documentation and user documentation. While system documentation is intended primarily for maintenance programmers, user documentation is intended primarily for users. User documentation consists of written or other visual information about an application system, how it works, and how to use it. For end-user applications, the nature and purpose of documentation has changed from documentation intended for the maintenance programmer to documentation for the end user. Application-oriented documentation, whose purpose is to increase user understanding and utilization of the organization's computing resources, has also come to be important. While some of this user-oriented documentation continues to be supplied by the information systems department, much of it now originates with vendors and with users themselves.

Training and support are critical for the success of an information system. Computer training has typically been provided in classes and tutorials. The current emphasis in training is on automated delivery methods, such as on-line reference facilities, multimedia training, and electronic performance support systems. The latter embed training in applications themselves in an attempt to make training a seamless

part of using an application for daily operations. The emphasis in support is also on providing on-line delivery, including on-line support forums and bulletin board systems. As organizations move toward client/server architectures, they rely more on vendors for support. Vendors provide many on-line support services, and they work with customers to bring many aspects of on-line support in-house. An information center provides general support to all users, and a help desk provides aid to users in a particular department or for a particular system. (Hoffer, George and Valacich 1999)

How can we tell whether a system is successful? This is not always an easy question to answer. Not everyone may agree about the value or effectiveness of a particular information system. Individuals with different decision-making styles or ways of approaching a problem may have totally different opinions about the same system. To further complicate the picture, what users say they like or want in a new information system may not necessarily produce any meaningful improvements in organizational performance. (Markus and Keil 1994)

Nevertheless, MIS researchers have looked for a formal set of measures for rating systems. Various criteria have been developed, but the following measures of system success are considered the most important:

- (1) High levels of system use, as measured by polling users, employing questionnaires, or monitoring parameters such as the volume of on-line transactions.
- (2) User satisfaction with the system, as measured by questionnaires or interviews. This might include users' opinions on the accuracy, timeliness, and relevance of information; on the quality of service; and perhaps on the schedule of operations. Especially critical are managers' attitudes on how

well their information needs were satisfied (Davis 1989; Ives 1983; Westcott 1985) and users' opinions about how well the system enhanced their job performance.

- (3) Favorable attitudes of users about information systems and the information systems staff
- (4) Achieved objectives, the extent to which the system meets its specified goals, as reflected by improved organizational performance and decision making resulting from use of the system.
- (5) Financial payoff to the organization, either by reducing costs or by increasing sales or profits.

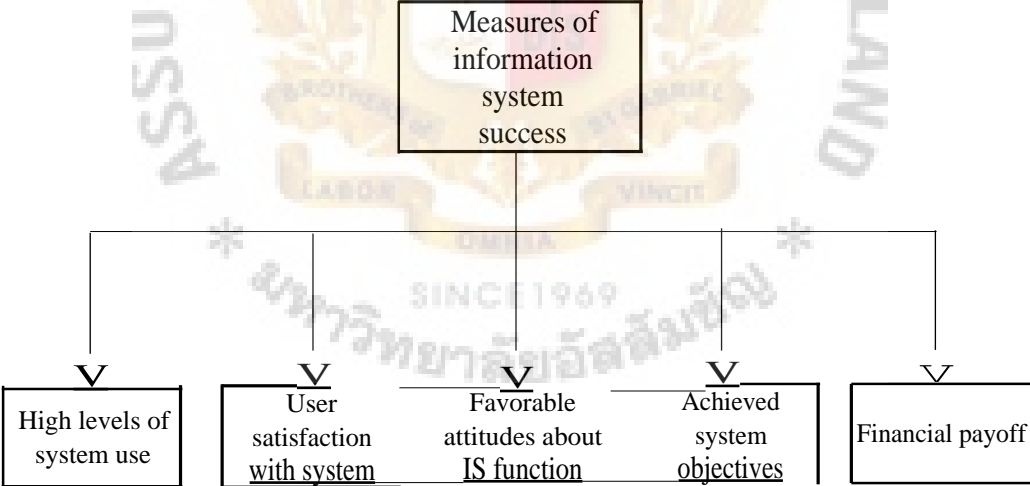
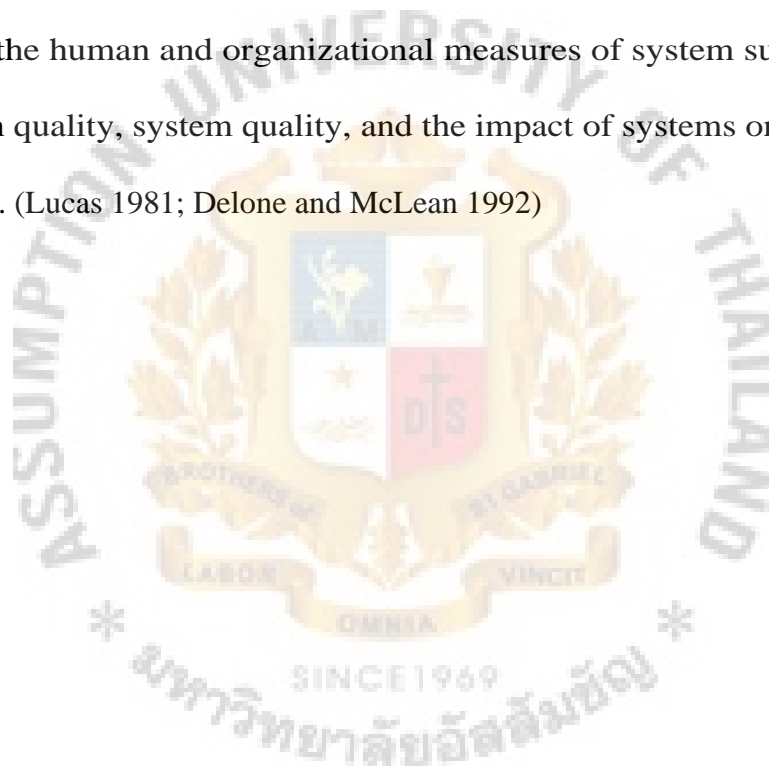


Figure 2.1. Measures of Information System Success.

The fifth measure is considered to be of limited value even though cost-benefit analysis may have figured heavily in the decision to build a particular system. The benefits of an information system may not be totally quantifiable. Moreover, tangible benefits cannot be easily demonstrated for the more advanced decision-support system applications. And even though cost-benefit methodology has been rigorously pursued, the history of many systems development projects has shown that realistic estimates have always been difficult to formulate. MIS researchers have preferred to concentrate instead on the human and organizational measures of system success such as information quality, system quality, and the impact of systems on organization performance. (Lucas 1981; Delone and McLean 1992)



III. ANALYSIS OF THE EXISTING SYSTEM

3.1 Accounting Books Used in the Manual System

There are eight accounting books used to record the accounting transactions:

- (1) Cash Receivable Book, used to record the amount of cash and cheque receipts including the amount received from bank transfer and bank credit advices.
- (2) Bank Payment Book, used to record payments by cheques including bank debit advices.
- (3) Petty Cash Payment Book, used to record payments by petty cash.
- (4) Purchase Tax Report Book, used to record the purchase tax amounts from purchase tax invoices.
- (5) Sales Tax Report Book, used to record sales amounts and sales tax amounts from tax invoices.
- (6) Goods Purchased Book, used to record the cost of goods purchased from suppliers.
- (7) Revenues & Expenses Book, contains all general ledger accounts as shown on the income statement. This book is used to record the transactions posting from cash receivable book, bank payment vouchers, petty cash payment vouchers, sales tax report book, and journal vouchers.
- (8) Assets & Liabilities Book, contains all general ledger accounts as shown on the balance sheet. This book is used to record the transactions posting from cash receivable book, bank payment vouchers, petty cash payment vouchers, purchase tax report book, sales tax report book, and journal vouchers.

3.2 Steps in Manual System

The steps involved in the process of the current manual system from daily operation to the preparation of financial statements:

- (1) Record transactions from receipt vouchers into Cash Receivable Book.
- (2) Record transactions from bank payment vouchers into Bank Payment Book and the related general ledger accounts.
- (3) Record transactions from petty cash payment vouchers into Petty Cash Payment Book and the related general ledger accounts.
- (4) Record transactions from purchase tax invoices into Purchase Tax Report Book.
- (5) Record transactions from tax invoices into Sales Tax Report Book.
- (6) Record the cost of purchased goods from bank payment vouchers, petty cash payment vouchers, and journal vouchers into Goods Purchased Book.
- (7) Sum up the amounts in Cash Receivable Book at the end of the month and post to related general ledger accounts, Bank Payment Book, and Petty Cash Payment Book.
- (8) Sum up the amounts in Purchase Tax Report Book at the end of the month and post to related general ledger accounts.
- (9) Sum up the amounts in Sales Tax Report Book at the end of the month and post to related general ledger accounts.
- (10) Post transactions from journal vouchers to related general ledger accounts.
- (11) Close Bank Payment Book at the end of the month.
- (12) Close Petty Cash Payment Book at the end of the month.
- (13) Close Goods Purchased Book at the end of the month.

(14) Close Revenues & Expenses Book at the end of the month.

(15) Close Assets & Liabilities Book at the end of the month.

(16) Prepare Trial Balance:

- (a) Post the debit balance from Petty Cash Payment Book into Trial Balance.
- (b) Post the debit or credit balances from Bank Payment Book into Trial Balance.
- (c) Post the debit or credit balances from Goods Purchased Book into Trial Balance.
- (d) Post the debit or credit balances from Revenues & Expenses Book into Trial Balance.
- (e) Post the debit or credit balances from Assets & Liabilities Book into Trial Balance.
- (f) Sum up the debit and credit balances on Trial Balance and check if the total debit and total credit are equal. If they are equal, then we can proceed to prepare Cost of Goods Sold Statement.

(17) Prepare Cost of Goods Sold Statement:

- (a) Post the beginning inventory amount into Cost of Goods Sold Statement.
- (b) Post the debit or credit balances from Goods Purchased Book into Cost of Goods Sold Statement.
- (c) Post the ending inventory amount into Cost of Goods Sold Statement.
- (d) Find the amount of the cost of goods sold by using the relations:
$$\text{Cost of goods sold} = \text{beginning inventory} + \text{purchase} - \text{ending inventory}.$$

(18) Prepare Income Statement:

- (a) Post the sales revenue and all other revenues from Revenues & Expenses Book into Income Statement.
- (b) Post the expenses from Revenues & Expenses Book into Income Statement.
- (c) Find the net income using the relations:

$$\text{Net income} = \text{revenues} - \text{expenses}$$

(19) Prepare Consolidated Income Statement by adding Income Statement of CCTV group and Income Statement of Radio Transceiver group.

(20) Prepare Balance Sheet:

- (a) Post the debit or credit balances from Assets & Liabilities Book into each category of assets, liabilities and owner's equity in Balance Sheet.
- (b) Post the net income from Income Statement into the retained earnings in Balance Sheet.
- (c) Sum up the total assets and total liabilities and equity. The total of both sides of Balance Sheet must be equal.

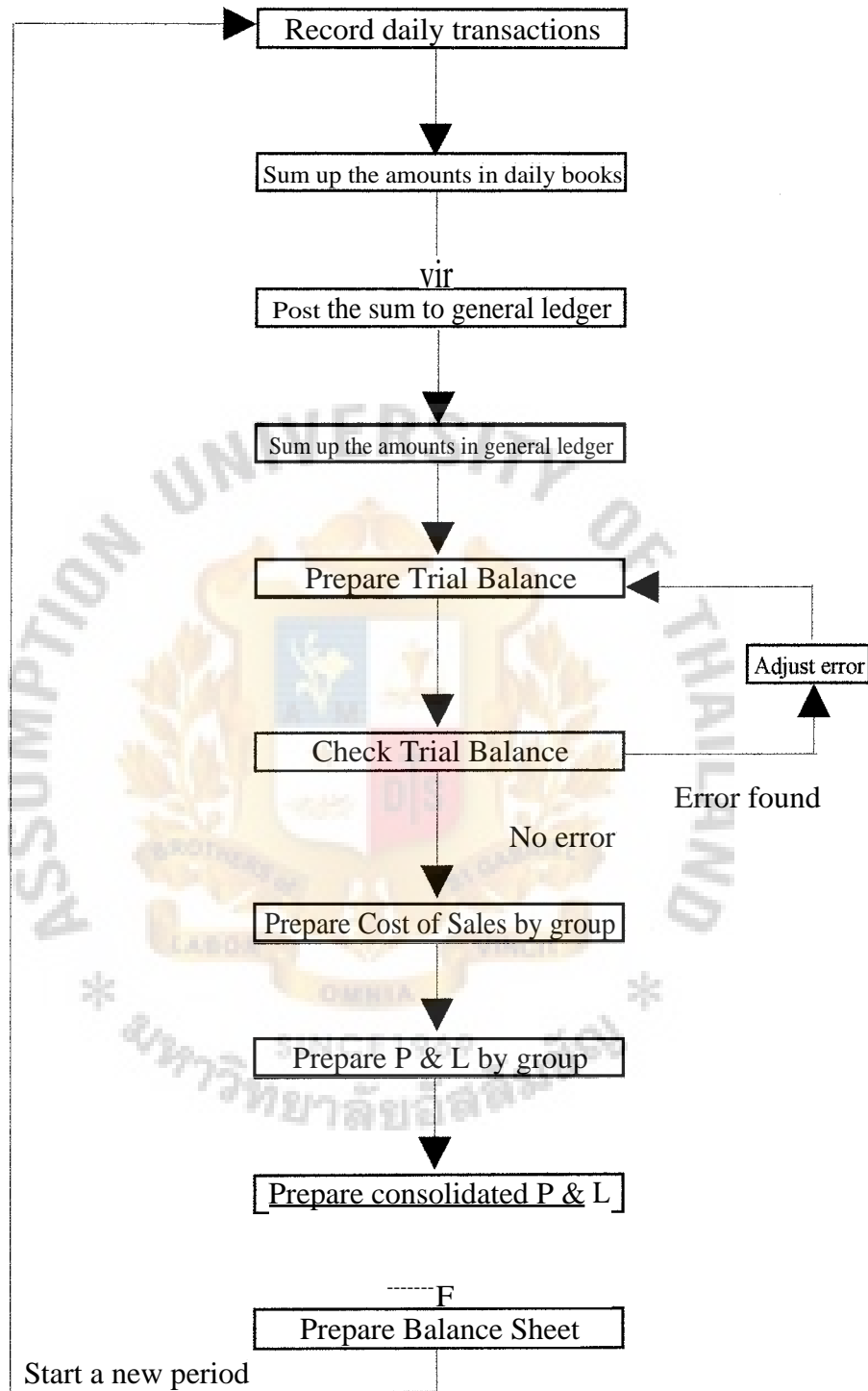


Figure 3.1. The Flowchart of the Current Manual GL System.

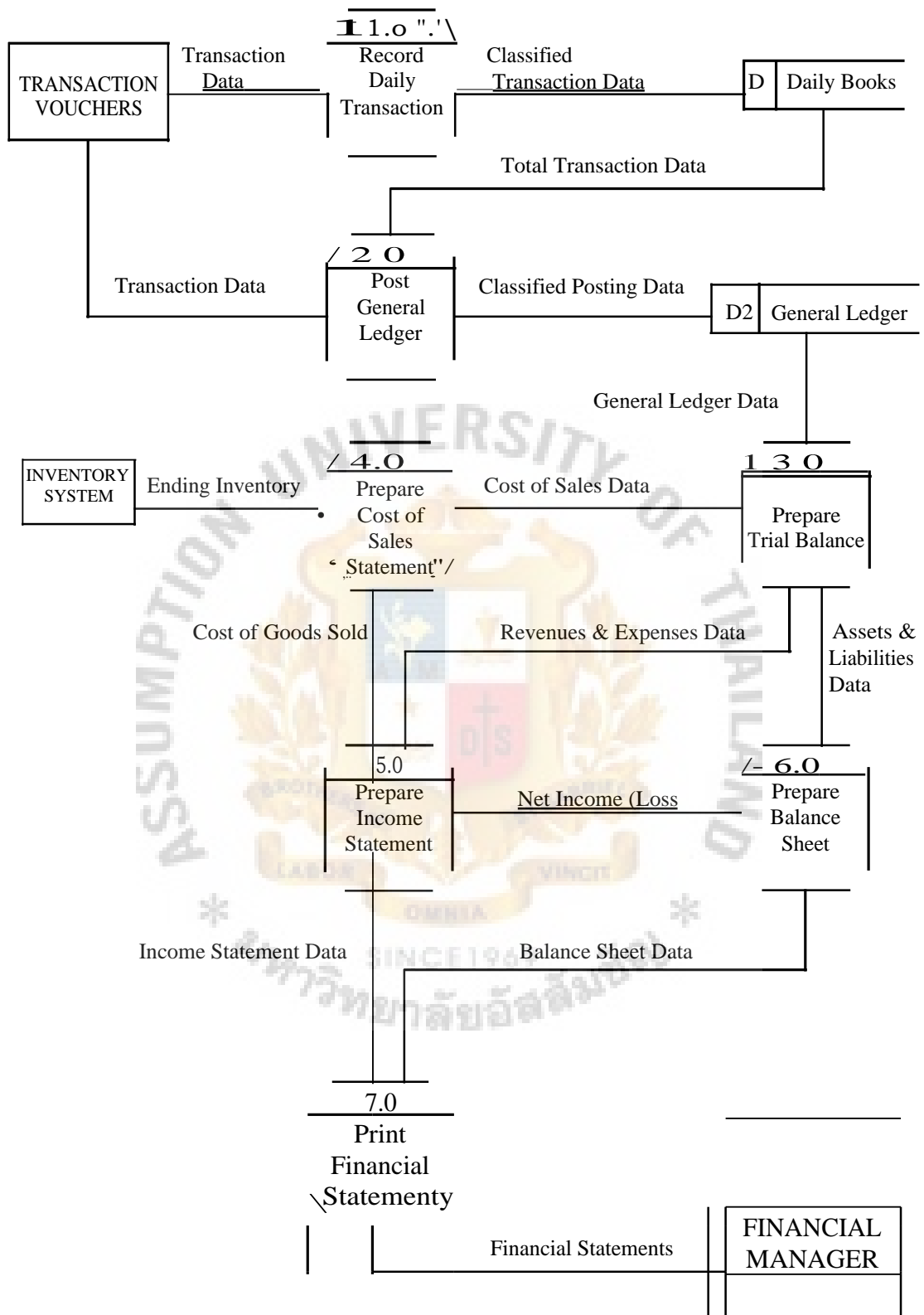
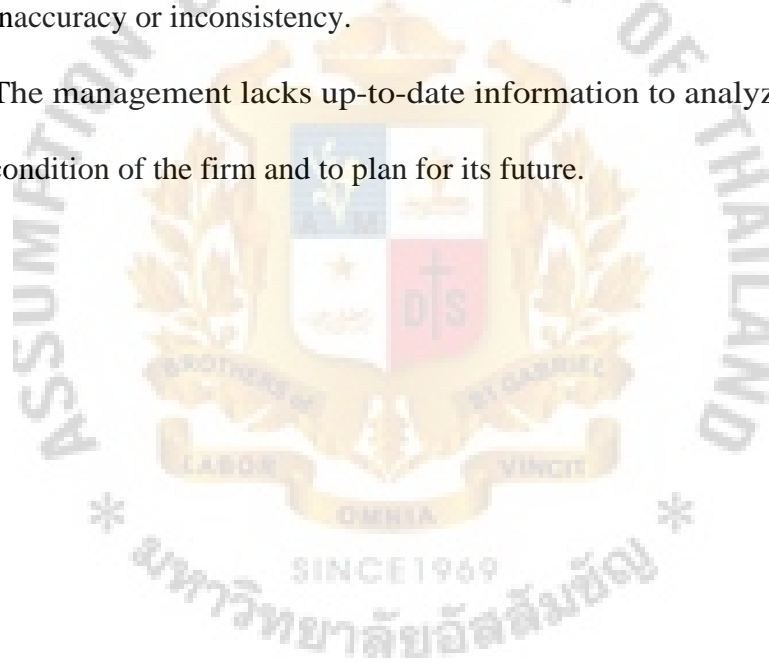


Figure 3.2. Data Flow Diagram for Current Manual GL System.

3.3 Problems with Current System

The problems which exist in the current manual system are as follows:

- (1) The process is very slow due to the entire process is done by hand. It normally takes one month to complete the closing process of the accounting books. On many occasions, it takes about two months to get the financial statements.
- (2) There is a substantial amount of redundant steps of data processing on preparing, entering, calculating and posting which has caused a high level of inaccuracy or inconsistency.
- (3) The management lacks up-to-date information to analyze the financial condition of the firm and to plan for its future.



IV. THE PROPOSED SYSTEM

4.1 User Requirements

After determining how current manual system functions and realizing the problems existed in the current system, the next step is to assess what users would like to see in a new system. After gathering information from the users, the requirements in the new computerized system are as follows:

- (1) The users demand that the system is easy to install, easy to use, and flexible enough to fit the current manual system.
- (2) The selected software must be able to run on the existing hardware and operating system software to save the investment cost.
- (3) The selected software should also be easy to upgrade when it is improved or when the regulations change.
- (4) The selected software must be able to provide accounting reports that comply with accounting standard practices and all other governing regulations.
- (5) The vendor must provide sufficient training on how to install and use the system as well as provide help as problems arise after installation.
- (6) The vendor must have other accounting packages that can integrate with the general ledger system if this should be required in future.
- (7) The continued financial health of the vendor must be considered carefully to ensure their long maintenance support to the system.

4.2 Software Acquisition

Determined by the situation, the best decision is to purchase the pre-written software package from the selected vendor. The selected software package is called GENEUS General Ledger system. GENEUS software packages are developed by Thai Software Enterprise Co., Ltd. and distributed by SVOA Center Co., Ltd. The company decides to purchase the software from a branch of SVOA Center which is located near the office. The selection decision which is mutually agreed by the management and the users is based on the following reasons:

- (1) As mentioned earlier, general ledger is the application that is common to all business organization so it is not necessary for the company to write its own program which would require considerable time and cost. Moreover, the company does not even have the expertise or personnel available to develop the system in-house.
- (2) The selected software has been well-known as the Thai-language accounting software for more than 15 years. Their software has been tested and used for long time and would usually be more reliable than other brands that were just recently released.
- (3) The selected vendor (SVOA Center) has been in IT business for more than 20 years with more than 70 dealers nationwide which can guarantee the stability of the firm.
- (4) The cost of the selected software is in fact the only one which meets the set budget of 10,000 Bahts. Table 4.1 illustrates the price comparison among the Thai-language accounting software available in the market.

- (5) The design of the selected software is compatible with the current accounting structure so the users do not have to adapt the ways they work to fit the software.
- (6) The selected software is very flexible because additional modules, such as inventory control, accounts receivable, etc. can be added as needed in future.
- (7) The selected software meets the objectives and scope of the project as well as meets the user requirements.

Table 4.1. Price Comparison of General Ledger Software Package.

Brand	Price (Baht)
GENEUS GL	9,650
Express	16,000
BC ACCOUNT	20,000
CD Organizer	14,700
Auto Flight	25,000
Accellent	19,000

4.3 System Requirements

The hardware and software required for the new system are as follows:

(1) Hardware:

- (a) Personal Computer Pentium 100 MHZ up
- (b) Minimum 8 MB RAM
- (c) Minimum 40 MB Hard Disk Space

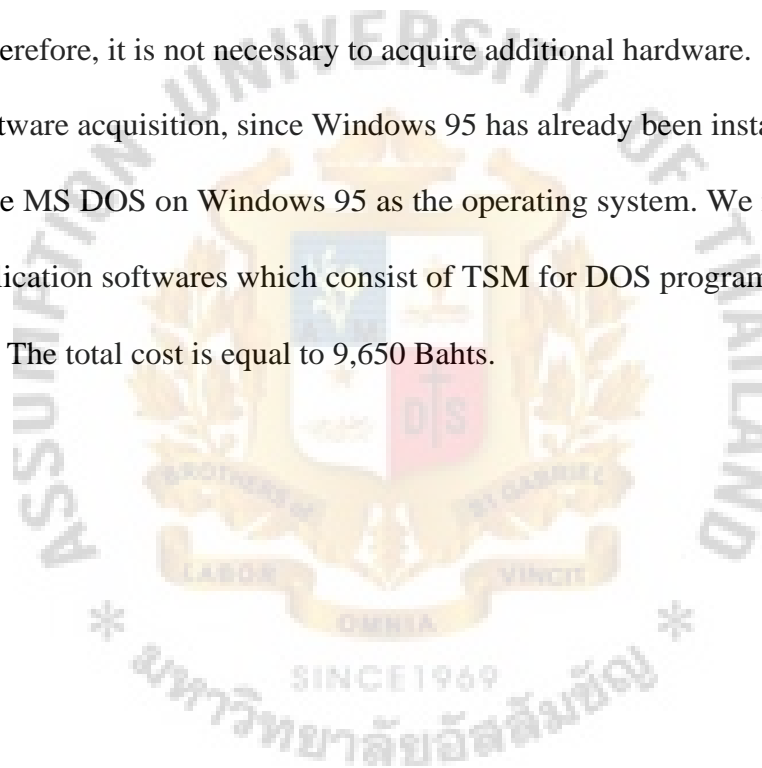
- (d) Dot Matrix Printer 15"

(2) Software:

- (a) MS DOS Version 5.0 up
- (b) TSM (Thai System Manager) for DOS
- (c) GENEUS GL Program

The accounting department currently possesses one stand-alone PC with Pentium 166 MMX, RAM 16 MB and hard disk 2.1 GB. The dot matrix 15" printer is also available. Therefore, it is not necessary to acquire additional hardware.

For software acquisition, since Windows 95 has already been installed in this PC, so we can use MS DOS on Windows 95 as the operating system. We need to acquire only the application softwares which consist of TSM for DOS program and GENEUS GL program. The total cost is equal to 9,650 Bahts.



V. CHARACTERISTICS OF GENEUS GL SYSTEM

5.1 General Features

GENEUS General Ledger (GL) system is the application software program used to record accounting transactions and automatically post data to update ledger accounts, close the ledger accounts, and generate financial statements at the end of the period.

The general features of GENEUS GL system are as follows:

- (1) Perform in Real Batch Processing, i.e. record all the transactions before posting to general ledger.
- (2) Contain Menu Driven and Full Screen Editing.
- (3) Contain Error Message to show mistake during operation.
- (4) Contain Password for security protection.
- (5) Contain On-Line Help to assist in operation.
- (6) Can provide the description of each transaction.
- (7) Check the total debit and credit while recording to prevent unbalance result.
- (8) Can select the year A.D. or B.E.
- (9) Can select the output report either on screen or on hard copy through printer.
- (10) Provide necessary reports for tax purpose, such as purchase tax report and sales tax report.
- (11) Provide financial statements, such as income statement and balance sheet.
- (12) Provide financial analysis reports for management, such as financial ratio report and comparative income statement.
- (13) Comply with accounting standard and Revenue Department Announcement.

5.2 Capacities of the System

GENEUS GL system can be used as the stand-alone system or can be integrated with other related system. Another capacities of the system are listed below:

- (1) Can handle both inventory methods either Perpetual or Periodic.
- (2) Can specify the number of closing period from one to thirteen time per one year.
- (3) Can assign department code. The maximum characters for department codes are 3 characters with unlimited department codes.
- (4) Maximum daily transaction books are 20 books.
- (5) Maximum characters for accounting codes are 7 characters with unlimited accounting codes.
- (6) Maximum accounting amounts are 90,000,000,000.00 Bahts.
- (7) Can keep historical records up to 5 years.
- (8) Can input budget figures to compare with actual figures.

5.3 Steps in GENEUS GL System

The steps involved in the process of GENEUS GL system from the beginning stage until the closing stage are as follows:

- (1) The beginning stage. This stage is done only once:
 - (a) Open a new system; set the necessary data to be used with the system:
 - (1) Set basic data; such as select the year A.D. or B.E., the starting month of accounting period, the number of closing period in one year, the current year, the printer number, the inventory method, income statement by department (Y/N), historical record (Y/N), profit & loss accounting code, retained earning accounting code,

cost of goods sold accounting code, the last date of each monthly closing.

- (2) Open new files; to create empty files for storing the data from daily operation.
- (3) Set password; to protect the system from unauthorized user.
- (4) Set company's name and address.
- (5) Set types of daily books; to specify how many daily books to be used in the system and the code number and the name of each book.
- (6) Set department codes; to set how many departments and the code number and name of each department. These data are used to generate income statement by department.
- (7) Set accounting ranges for analysis and closing process; to set the ranges of the accounts according to the categories specified in financial statements, such as current assets, fixed assets, other assets, current liabilities, long-term liabilities, owner's equity, revenues and expenses.

(b) Set details of accounting chart; to create the main accounting file which records the details of account codes, account names, department codes, department names and balance brought forward of each account:

- (1) Set accounting codes; to set all accounting codes used in the company's accounting system. The codes must be correspond to step (a) "Open a new system".

- (2) Set accounting names; to set all accounting names used in the company's accounting system. The names must be correspond to step (a) "Open a new system".
 - (3) Set department codes; to set department codes for the accounts used to generate income statement by each department.
 - (4) Record beginning balances; to record beginning balances of each account from the manual system.
- (c) Record the budget amount of each account; if the company has budget system to control the actual revenues and expenses. These records will be used to generate comparative income statement.
- (d) Record historical data of each account; to record the historical data of each account. These records will be used to generate comparative income statement.
- (2) Daily operation:
- (a) Record the current date. This is to enter the current date when the operator starts to input the daily transactions. This date will be used to generate the daily reports.
 - (b) Record daily transactions. This is to input the daily transaction data from various vouchers according to double entry principle.
 - (c) Print daily reports. After we input all daily transaction data for the whole month we may ask the system to generate daily report printout to keep as accounting documents.
 - (d) Check daily reports. This is to check if there is any mistake on the daily operation.

- (e) Post data to general ledger. If there is no mistake then we instruct the system to post the daily input data to general ledger.
- (f) Backup data. This is to back up data from hard disk to floppy disk for protection of data in case if there is any problem to hard disk later such as electricity failure.

(3) Closing process. This is to prepare financial reports and close the accounts:

- (a) Prepare cost of sales statement. From the menu of accounting reports we select the sub menu of cost of sales statement to input the ending balance of inventory account of each department.
- (b) Prepare income statement. If we have set at the beginning stage that we need the cost of sales statement then we do not have to process this step. But if we do not indicate that we need the cost of sales statement then we have to input the ending balance of inventory account of each department.
- (c) Print financial reports. From the menu of accounting reports we select and print successively the sub menu of general ledger, trial balance, costs of sales, income statement, balance sheet, financial ratio report, etc.
- (d) Backup data. We back up data from hard disk to floppy disk again to save the data if there is any problem to the hard disk later and also for the purpose of any correction to the data if required.
- (e) Close the accounts. This is to transfer the total amount of the data for this period to next period. The data of this period are then deleted.

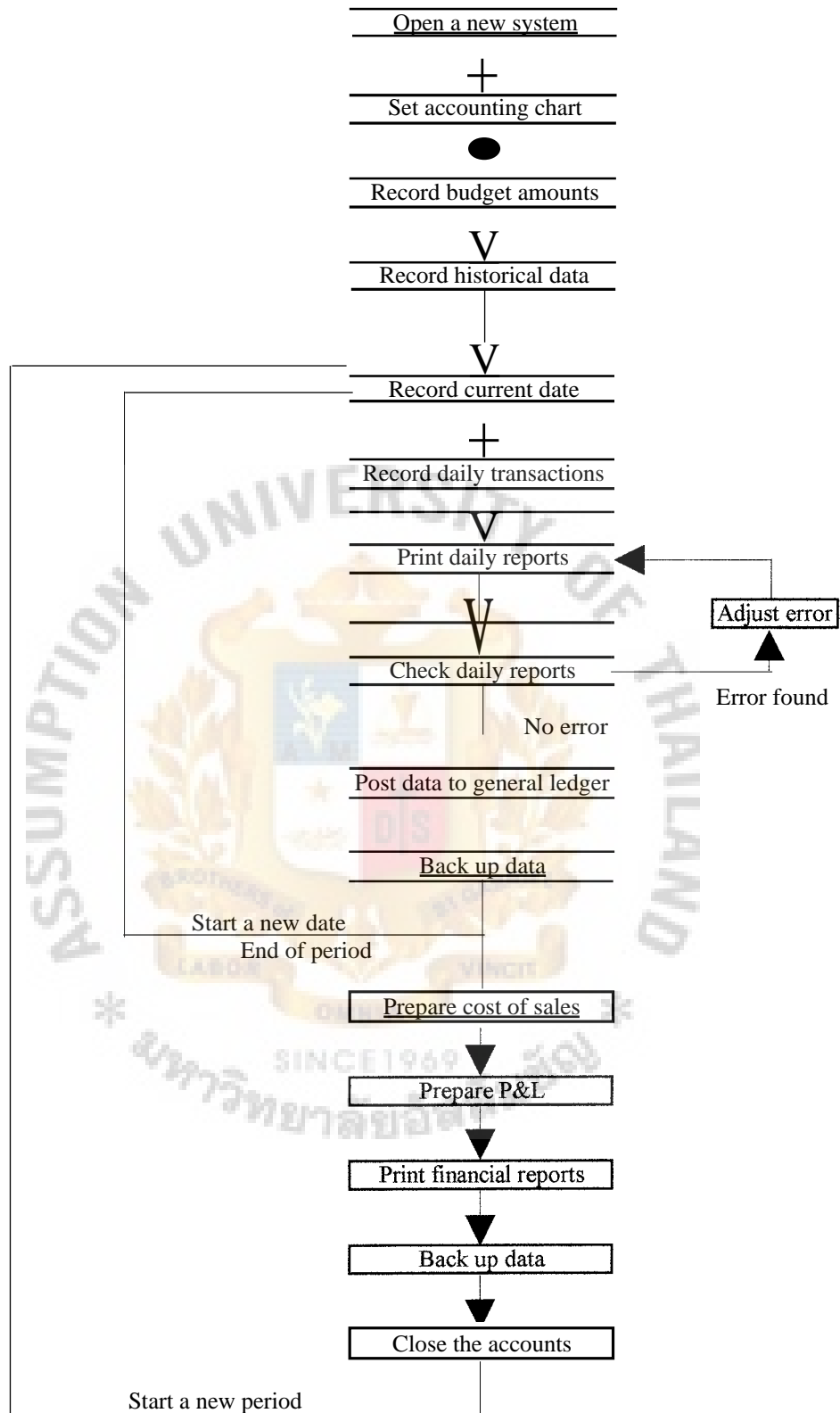


Figure 5.1. The Flowchart of the GENEUS GL System.

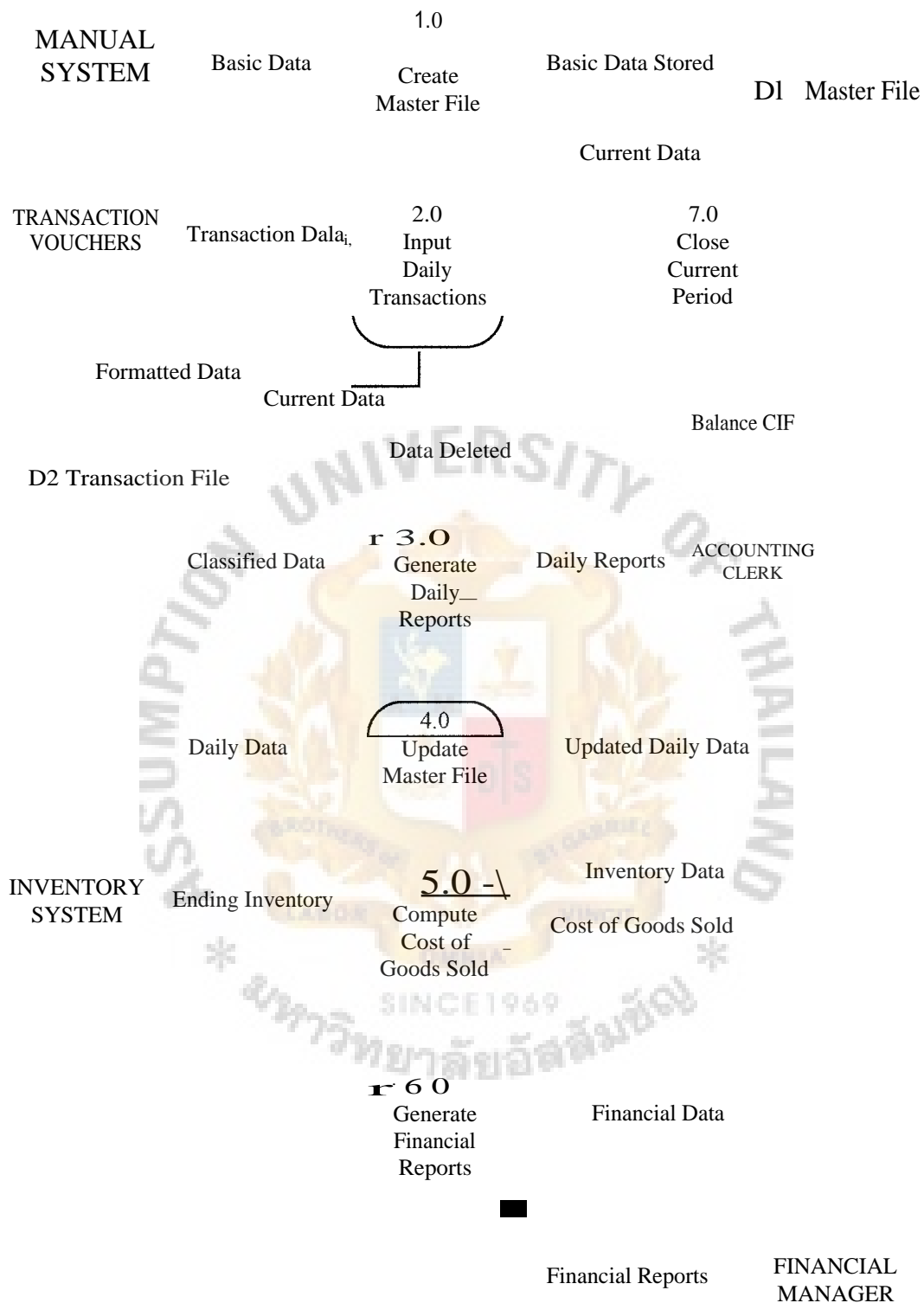


Figure 5.2. Data Flow Diagram for GENEUS GL System.

VI. PERFORMANCE EVALUATION

After installation of GENEUS GL program the parallel conversion approach; both the manual system and the computerized system are run together, has been used to assure that the new system functions correctly. The performance evaluation is also been made to determine if the new system meets the organizational and user requirements. The results are as follows:

- (1) The computerized system can increase speed of accounts closing process. During the parallel testing for two months of closing period the results of the speed increase are 44 percent and 46 percent respectively. The results of the performance of each system are as shown in Table 6.1.
- (2) From the result of speed increase we can now perform cost-benefit comparisons by using the concept of the time value of money. The costs of the project consist of one time cost which is the purchase cost (bht 9,650) and recurring cost which is the annual maintenance cost (bht 1,780). The benefit of the project can be calculated based on the time saved by 500 minutes per month. The salaries of two accounting staff are equal to bht 18,000 per month or bht 1.33 per minute ($18,000 / 30 / 7.5 / 60$). The benefit the company receives per month is equal to bht 665 (500×1.33) and bht 7,980 per year (665×12). The current interest rate or discount rate is set at 10%. Because most information systems have a useful life of more than one year and will provide benefits and incur expenses for more than one year, we will use a three-year time for cost-benefit analysis calculation (see Table 6.2).

Table 6.1. The Time Spent in Manual System and Computerized System.

The Time Spent in Manual System (in Minutes)

Activities	1 st Month	2 nd Month
1. Record daily transactions	585	568
2. Sum up the amounts in daily books	120	117
3. Post the sum to general ledger	20	19
4. Sum up the amounts in general ledger	120	117
5. Prepare Trial Balance	110	107
6. Prepare Cost of Sales Statement	60	58
7. Prepare Income Statement	65	63
8. Prepare Balance Sheet	50	49
Total	<u>1,130</u>	<u>1,098</u>

The Time Spent in Computerized System (in Minutes)

Activities	1 st Month	2 nd Month
1. Record daily transactions	425	398
2. Print daily reports	50	47
3. Check daily reports	65	60
4. Post data to general ledger, print general ledger, print Trial Balance, backup data	65	60
5. Prepare Cost of Sales Statement, Income Statement	10	10
6. Print Financial Statements, backup data, close the accounts	15	15
Total	<u>630</u>	<u>590</u>

Computerized System VS Manual System = 630 VS 1130 590 VS 1098

Speed increased	=	500	508
		44%	46%

Table 6.2. Cost-Benefit Comparisons.

	Year 0	Year 1	Year 2	Year 3	Total
Net economic benefit	0	7,980	7,980	7,980	
Discount rate (10%)	1.0000	0.9091	0.8264	0.7513	
PV of benefit	0	7,255	6,595	5,995	
NPV of all benefits	0	7,255	13,850	19,845	19,845
One-time cost	(9,650)				
Recurring cost	0	0	(1,780)	(1,780)	
Discount rate (10%)	1.0000	0.9091	0.8264	0.7513	
PV of recurring cost	0	0	(1,471)	(1,337)	
NPV of all costs	(9,650)	(9,650)	(11,121)	(12,458)	(12,458)
Overall NPV Cash Flow	(9,650)	(2,395)	2,729	7,387	7,387
Overall ROI (Overall NPV Cash Flow / NPV of all costs)					59%

PV is the present value of the future amount in each year.

NPV is the net present value accumulated at the end of each year.

The overall net present value cash flow for the project (bht 7,387) shows that overall, benefits from the project exceed costs.

The overall return on investment (ROI) for the project is also shown 59%.

(3) The computerized system can save personnel expenses. As mentioned earlier, the management has initially decided to increase the number of accounting staff. If say, increasing one person, it will cost about 8,000 Bahts per month for basic salary alone or 96,000 Bahts annually. The purchasing cost of GENEUS GL software package is 9,650 Bahts and this is one time payment. This obvious saving will be accumulated over the years.

(4) The program is easy to install. The installation process is very simple and takes only two minutes to complete the installation. The installation process is done by following steps:

(a) Click Start \ Run on Windows

(b) Insert GL program diskette volume 1 in drive A and type:

A:GLINST A C 1 <ENTER>

(c) The installation run until the instruction on screen says:

Insert program diskette volume 2 in drive A

(d) Replace the program diskette and press <ENTER>

(e) Wait until it says on screen:

Installation complete

(5) The program is easy to use. It contains Menu Driven and Full Screen Editing, i.e. there are selective headings for each stage of function. If there is any error during operation, we can go back to the error spot to correct it.

(6) The program is very flexible which can easily adapt to the current manual system.

- (7) The program is able to run on the existing hardware and operating software without any problem. This has also improved the asset utilization of the firm.
- (8) The upgrade (if any) in future will be easy to do. The vendor will provide the upgrade diskette. The installation of the upgrade diskette is exactly the same as the existing version. The upgrade version will automatically convert the data from the old version to the new version.
- (9) The accounting procedures and the financial reports generated from the system conform with accounting standard practices and revenue codes.
- (10) The vendor has provided training for two accounting staff on how to install and use the system at the vendor's office. If there is any problem or question arised after training the vendor's supporting staff will help to solve the problem either by telephone or personal contact.
- (11) The computerized system has reduced the repetitive data input and at the same time increased the financial output (see Table 6.3).
- (12) The vendor also has other accounting software packages that can integrate with the general ledger system if this should be required in future.
- (13) The financial health of the vendor is considered to be in good position. They have been in IT business for more than 20 years with more than 70 dealers and more than 20,000 customers nationwide.
- (14) The computerized system creates a new opportunity for the current staff to acquire new roles and job skills.

Table 6.3. The Output from Manual System and Computerized System.

The Output from Manual System

- 1. Trial Balance
- 2. Cost of Sales Statement
- 3. Income Statement
- 4. Balance Sheet

The Output from Computerized System

- 1. Daily Transaction Report
- 2. General Ledger Account Report
- 3. Purchase Tax Report
- 4. Sales Tax Report
- 5. Trial Balance
- 6. Cost of Sales Statement
- 7. Income Statement
- 8. Balance Sheet
- 9. Income Statement compared with prior period
- 10. Income Statement compared with same period last year
- 11. Income Statement compared with budget
- 12. Financial Ratio Analysis Report

VII. CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Vision Technology Co., Ltd. is a Thai company founded in 1982. They divide their business into two groups, CCTV and radio transceiver. The accounting department prepares income statement for each group as well as the consolidated income statement and balance sheet. The current accounting system is an entirely manual system which has created a lot of problems such as the slow process of accounts closing, the inaccuracy of repetitive data, and the lack of timely financial statements. As accounting information is important for the company's financial success, the management decides to solve the problems by computerizing the general ledger system within the budget of 10,000 Bahts.

If a company has a need for a computerized information system but does not have the programming staff to develop the system in-house, a software package is a good solution. The major advantages of purchasing a software package are that it is usually less expensive and takes a shorter length of time to install the system. There are many applications that are common to all business organizations, e.g. payroll, accounts receivable, general ledger, inventory control, etc. There are also several vendors who developed software packages. The criteria to choose among packaged software products include cost, functionality, vendor support, vendor viability, flexibility, documentation, response time, and ease of installation. The two most important criteria may be vendor viability and vendor support. Under specific situation, such as when there is only limited budget or when the product is unique to that vendor, the informal process of directly contacting a single vendor may be appropriate. The selection

decision is usually made by management, however, the users should also be involved in the final selection. After acquisition, system implementation follows. System implementation consists of four activities; installation, documentation, training, and support. Installation includes conversion of the current system to the new system. There are four types of installation, direct, parallel, single location, and phased. Documentation can be divided into two basic types, system documentation and user documentation. Training and support are provided by the vendor who supplied the software package. The success of the implementation can be measured by various criteria include (1) high levels of system use, (2) user satisfaction, (3) favorable user attitudes about the information system and its staff, (4) achieved objectives, and (5) financial payoff to the organization.

The current manual system uses eight accounting books to record the accounting transactions. They are (1) cash receivable book, (2) bank payment book, (3) petty cash payment book, (4) purchase tax report book, (5) sales tax report book, (6) goods purchased book, (7) revenues & expenses book, and (8) assets & liabilities book. There are twenty steps in the process of the current manual system starting from the record of daily transaction data to the sum up of the amounts and posting to the ledger until the preparation of financial statements. The problems on the manual system are that the processes are very slow with a lot of redundant steps of data processing and the result of these slow processes are that the management lacks up-to-date financial information.

After determining the existing problems of the manual system, the user requirements have been gathered to assess what they would like to see in a new system. The users demand that the selected software must be easy to install, easy to use, easy to upgrade and flexible enough to fit the current manual system. The users also demand

that the vendor must provide sufficient training and long lasting support to the system. The choice of the software package has been made to purchase GENEUS GL system from SVOA Center. The selected software package costs 9,650 Bahts which meets the set budget of 10,000 Bahts and also meets the objectives and scope of the project as well as meets the user requirements.

GENEUS GL system is the application software program used to automate the routine tasks of the accounting function. After recording the daily transactions, the system will automatically post data to update ledger, close the accounts, and generate financial statements at the end of the accounting period. The program contains several features and capacities necessary to support the current functions as well as any expansion in future. The processing steps of the system consist of three main steps; (1) the beginning stage which is done only once, (2) daily operation, and (3) closing process.

The performance evaluation has been made to determine the success of the new system. The computerized system has provided many benefits to the accounting department and to the company. It can automate monotonous jobs, increase the speed of closing process, reduce data entry errors and provide more timely financial information. The cost-benefit analysis also resulted that the benefits exceeded costs. The output of the new system also help the management to make better decision and plan for the future. The general ledger system of Vision Technology Co., Ltd. has been computerized successfully determined by the measures of system success such as high levels of system use, user satisfactions with the system, favorable attitudes of users about information systems, achieved objectives, and financial payoff to the organization.

7.2 Recommendations

The selection of software package in this project is suitable for small projects with limited budget. For large-scale projects with more time and money to implement, the selection decision may be different. Suppose the company in this project would like to computerize the whole accounting systems which include general ledger, inventory control, accounts receivable, accounts payable, etc., the acquisition cost of GENEUS package will become more expensive than other brands on the list. But as discussed earlier, cost is not the only factor for making the decision. Other factors, such as the quality of the software, vendor support and viability of vendor are considered more important than cost. When the scope of project becomes larger and the purchased amount is more significant the issuance of a request for proposal (RFP) may be needed. Issuing an RFP, though, may be more time consuming, will often result in a more thorough consideration of the available products. One method we can use to decide among the various products is called the weighted scoring method. Weighted scoring method gives alternative products a single score based on the extent to which they meet selected criteria. Weighted scoring method is used to support decision, rather than as the final arbiter of software selection. Before making acquisition decision, other sources of data should also be sought, including other users, industry groups, and software rating services. For software acquisition, this phase of the evaluation process is more important. It is almost impossible to determine all the limitations of a large software system. Also, software systems are even more dependent on the reliability and continued existence of the vendor. The level of service provided by the vendor is best determined by talking to other users. One thing that makes software acquisition so risky is that we are not just betting on the software product but also on the vendor. A

business failure of the vendor will usually mean the loss of software maintenance support for their product. Finally, the good software package is lost from the market.

In addition to these considerations, implementing a new information system is just as much as organizational change process as it is a technical process. Implementation involves more than installing a piece of software, turning it on, and moving on to the next software project. New systems often entail new ways of performing the same work, new working relationships, and new skills. Users have to be trained. Disruptions in work procedures have to be found and addressed. System implementation may be phased in over many weeks or even months. Management and users will want to know how long the implementation will take, how much training will be required, and how disruptive the process will be. If the new system calls for high levels of cooperation across departments when current operations involve very little of such cooperation, your management may not be willing to support such a system. Management may be willing to support a system that requires making a little more funding available if it means a little less of a change in the status quo than we might believe is necessary.



APPENDIX A

SAMPLES OF ACCOUNTING REPORTS

บริษัท บิโนเคปไทย จำกัด
รายงานรายวันตามสมุดรายวัน
วันที่ 31/01/2545

สมุดรายวัน : 01 สมุดรายวันรับเงิน				POSTED		หน้า 1	
วันที่	รายการ	เลขที่เอกสาร	อ้างอิงถึง	เดบิต / บัญชีเดบิต	เครดิต / บัญชีเครดิต	เดบิต	เครดิต
03/01/45	0000267	1-001		1200 001 ลูกหนี้การค้า		2,300.00	2,300.00
				1000 001 เงินสดในมือ			
พจน. เทปเทรเซอร์เงินรับ 4470						2,300.00	2,300.00
04/01/45	0000268	1-002		1200 001 ลูกหนี้การค้า			500.00
				1000 001 เงินสดในมือ			
บ. ไทยรุ่งโรจน์ จำกัด 4481							
0000269	1-003			1200 001 ลูกหนี้การค้า			1,712.00
				4340 003 รายได้อื่น ๆ			100.00
				1000 001 เงินสดในมือ		1,812.00	
ค. ธรรมศาสตร์ 4471							
0000270	1-004			1200 001 ลูกหนี้การค้า			802.50
				4340 003 รายได้อื่น ๆ			100.50
				1000 001 เงินสดในมือ		903.00	
พจน. สถาบันวิจัยสาร 4472							
0000271	1-005			1200 001 ลูกหนี้การค้า			2,145.35
				4340 003 รายได้อื่น ๆ			99.65
				1000 001 เงินสดในมือ		2,245.00	
เพ็ญมาศเพนนา แอนด์ โซนวิลา 4475							
0000272	1-006			1200 001 ลูกหนี้การค้า			321.00
				4340 003 รายได้อื่น ๆ			100.00
				1000 001 เงินสดในมือ		421.00	
ร้านกาแฟสดเมืองวิลา 4478							
0000273	1-007			1200 001 ลูกหนี้การค้า			4,654.50
				1540 001 ภาษีเงินได้หัก ณ ที่จ่าย		130.50	
				1000 001 เงินสดในมือ		4,524.00	
สำนักงานบรรษัทประกันภัยและประกันภัย 4482-4484							
0000274	1-008			1200 001 ลูกหนี้การค้า			684.80

Figure A.1. Daily Receipt Book Report.

บัญชี รับเงินโดย จาก
รายงานรายวันตามสมุดรายวัน
เมื่อวันที่ 31/01/2545

POSTED					หน้า	1
สมุดรายวัน : 02 สมุดรายวันจ่ายเงิน	วันที่	รายการที่ เลขที่เอกสาร	ข้างฝั่ง	เลขที่บัญชี แผนก ย่อยบัญชี	เดบิต	เครดิต
07/01/45 0000324 พท-001				2870 001 เงินปันผล		
				2000 001 เงินเบิกเกินบัญชี - ธนาคารกรุงไทย	6,944.00	6,944.00
				บจ.จิว แคมป์คูล ออโต้ ลีส นว785 งาดพ 1 -C		
03/01/45 0000380 กท-001				5840 002 ค่าธรรมเนียมธนาคาร		
				2010 001 เงินเบิกเกินบัญชี - ธนาคารกรุงไทย		5.00
				ธนาคารกรุงไทย L/C NO.001L649698 PPC -C		
04/01/45 0000325 พท-002				2590 001 เจ้าหนี้	16,666.67	
				6099 002 ดอกเบี้ยจ่ายอื่น ๆ	1,764.39	
				5899 002 ค่าใช้จ่ายเคดิต	15.00	
0000326 พท-003				2000 001 เงินเบิกเกินบัญชี - ธนาคารกรุงไทย		18,646.06
				บ.จิว แคมป์คูล (ประเทศไทย) จก.-C		
				1520 001 เงินพร่องจ่าย	17,820.00	
0000327 พท-004				2000 001 เงินเบิกเกินบัญชี - ธนาคารกรุงไทย		17,820.00
				PAC-ภาษี PPC 1103/01 -C		
				1520 001 เงินพร่องจ่าย	3,440.97	
0000328 พท-005				2000 001 เงินเบิกเกินบัญชี - ธนาคารกรุงไทย		3,440.97
				PAC-Freight PPC 1103/01 -C		
				1520 001 เงินพร่องจ่าย	6,099.57	
0000381 กท-002				2000 001 เงินเบิกเกินบัญชี - ธนาคารกรุงไทย		6,099.57
				บิลเบงกวัช-HOLYMX 115261 -C		
				5840 002 ค่าธรรมเนียมธนาคาร	5.00	
				5840 002 ค่าธรรมเนียมธนาคาร	200.00	
				2010 001 เงินเบิกเกินบัญชี - ธนาคารกรุงไทย		205.00
				ธนาคารกรุงไทย L/C NO.001L649697&649698-C		
ยอดรวมตามบัญชี					46,211.60	46,211.60

Figure A.2. Daily Payment Book Report.

บริษัท วิเศษกิจ จำกัด
รายงานรายวัน สมุทรธานี
วันที่ 31/01/2545

POSTED					หน้า	1
เลขที่	รายการ	วันที่	บัญชี	ยอด	ยอด	ยอด
28/12/44 0000012 012/1	012/1	28/12/44	001 เจ้าพนักงาน	424.00		
		1500	001 ภาษี	79.68		
		2580	001 เจ้าพนักงาน		424.00	
		2580	001 เจ้าพนักงาน		79.68	
	บ.จ. กิ่งเพชร					
				453.68		453.68
01/01/45 0000029 029/1	029/1	01/01/45	001 เจ้าพนักงาน	6,489.72		
		1500	001 ภาษี	454.28		
		2580	001 เจ้าพนักงาน		6,489.72	
		2580	001 เจ้าพนักงาน		454.28	
	บ.จ. อธิปไตย					
				6,944.00		6,944.00
02/01/45 0000077 077/1	077/1	02/01/45	001 เจ้าพนักงาน	467.29		
		1500	001 ภาษี	32.71		
		2580	001 เจ้าพนักงาน		467.29	
		2580	001 เจ้าพนักงาน		32.71	
	บ. เลิศวิเศษ					
				500.00		500.00
03/01/45 0000009 009/1	009/1	03/01/45	001 เจ้าพนักงาน	827.76		
		1500	001 ภาษี	57.94		
		2580	001 เจ้าพนักงาน		827.76	
		2580	001 เจ้าพนักงาน		57.94	
	บ. สยามวิเศษ					
				712.50		712.50

Figure A.3. Daily Purchase Book Report.

บริษัท วิชั่น เทคโนโลยี จำกัด
รายงานรายวันสมุดรายวัน
หมายเลข 31/01/2545

สมุดรายวัน : 04 สมุดรายวันขาย				POSTED		หน้า	
วันที่	รายการ	เลขที่เอกสาร	อ้างอิง	เลขที่ / วันที่บันทึกบัญชี	เลขที่บัญชี	เดบิต	เครดิต
02/01/45	0000129	4469		02/01/45 1200 001 ลูกหนี้การค้า		4,600.00	
				4020 003 ขาย			4,299.07
				2500 001 ภาษีขาย			300.93
0000130	4469			02/01/45 1200 001 ลูกหนี้การค้า			4,600.00
				4020 003 ขาย		4,299.07	
				2500 001 ภาษีขาย		300.93	
0000131	4470			02/01/45 1200 001 ลูกหนี้การค้า		2,300.00	
				4020 003 ขาย			2,149.53
				2500 001 ภาษีขาย			150.47
0000132	4471			02/01/45 1200 001 ลูกหนี้การค้า		1,712.00	
				4020 003 ขาย			1,600.00
				2500 001 ภาษีขาย			112.00
0000133	4472			02/01/45 1200 001 ลูกหนี้การค้า		1,712.00	
				4020 003 ขาย			1,600.00
				2500 001 ภาษีขาย			112.00
0000134	4472			02/01/45 1200 001 ลูกหนี้การค้า		1,600.00	
				4020 003 ขาย			1,712.00
				2500 001 ภาษีขาย		112.00	
0000135	4473			02/01/45 1200 001 ลูกหนี้การค้า		802.50	
				4020 003 ขาย			750.00
				2500 001 ภาษีขาย			52.50
0000136	4474			02/01/45 1200 001 ลูกหนี้การค้า		321.00	
				4020 003 ขาย			300.00

Figure A.4. Daily Sales Book Report.

บริษัท วิชั่นเทคโนโลยี จำกัด
รายงานรายวันตามสมุดรายวัน
ณวันที่ 31/01/2545

สมุดรายวัน : 05 สมุดรายวันทั่วไป				POSTED		หน้า	
วันที่	รายการ	ฝ่าย	เลขที่ / บัญชี	เดบิต	เครดิต	เดบิต	เครดิต
01/01/45 0000412 JV-001			4020 002 ขน				
			1560 001 รายได้ทั่วไป			615,565.56	615,565.56
0000413 JV-002	โอนกลับรายการรายได้ทั่วไป-C		4320 002 ดอกเบี้ยรับ				1,295.87
			4320 003 ดอกเบี้ยรับ				1,295.86
			1900 001 ภาษีเงินได้บุคคลธรรมดา				
			2100 001 เจ้าพนักงาน			1,104,941.68	
0000414 JV-003	โอนกลับรายการดอกเบี้ยเงินฝากเงินประจำ		5022 002 ออโต้สแตนด์				115,235.70
			5024 002 ออโต้สแตนด์และโทรศัพท์				263,387.10
			5024 003 ออโต้สแตนด์และโทรศัพท์				726,318.88
0000415 JV-004	โอนกลับรายการเจ้าพนักงานค่า-C,R		2300 001 ส่วนของหนี้ระยะยาวที่ค้างชำระใน 1 ปี				
			2870 001 เจ้าพนักงาน			1,485,042.96	1,485,042.96
0000416 JV-005	โอนกลับรายการเจ้าพนักงานค่าเข้าซื้อส่วนที่ค้างชำระใน 1 ปี		2530 001 ค่าใช้จ่ายค้างจ่าย				
			5790 002 ค่าเช่าที่ดิน			1,029,191.50	1,029,191.50
			5791 002 ค่าเช่าที่ดิน				102,344.00
			5800 002 เงินเดือนและค่าจ้าง				130,000.00
			5124 003 ค่าแรง				266,400.00
			6000 002 ดอกเบี้ยจ่าย				240,000.00
			6000 003 ดอกเบี้ยจ่าย				936.65
			5026 002 ค่าเช่า				995.08
			5028 002 ค่าเช่า				24,067.41
			5120 002 ค่าเช่าอาคาร				1,613.00
			5122 002 ค่าเช่า				111,374.00
			5710 002 ค่าเช่า				14,638.50
			5802 002 เงินสมทบกองทุนประกันสังคม				3,983.00
			5808 002 ค่าไฟฟ้า				3,981.50
			5810 002 ค่าเช่า				4,147.43
							126.48

Figure A.5. Daily Journal Voucher Report.

บริษัท วิมลพาณิชย์ จำกัด
รายงานรายวันตามตัววัน
ณวันที่ 31/01/2545

สมุดรายวัน : 06 สมุดรายวันเงินสดย่อย				POSTED		หน้า	
วันที่	รายการ	บัญชี	เลขที่บัญชี	ยอด	เดบิต	เครดิต	เครดิต
11/01/45 0000202 ย-001							
		เงินสดย่อย-C,R	5820	002 ค่าของใช้สำนักงาน	10.00		
			5820	003 ค่าของใช้สำนักงาน	10.00		
			1000	001 เงินสดในมือ			20.00
0000203 ย-002		เงินสดย่อย-C	5836	002 ค่าใบรับยกย่อง	20.00		
			5842	002 ค่าธรรมเนียมและค่าอื่น ๆ	20.00		
			1000	001 เงินสดในมือ			40.00
0000204 ย-003		เงินสดย่อย-C	5828	002 ค่าซ่อมแซมยานพาหนะ	1,128.85		
			2560	001 เงินค่าเช่า			31.65
			1000	001 เงินสดในมือ			1,097.20
0000205 ย-004		บริษัทเพอร์ซิอุส จำกัด. 85724-C	5834	002 ค่าใช้จ่ายในการเดินทาง	120.00		
			5826	002 ค่าเบี้ยประกันภัย	460.00		
			1000	001 เงินสดในมือ			580.00
0000206 ย-005		บริษัท 7852-C	5024	002 ค่าเบี้ยประกันภัย	1,097.50		
			5826	002 ค่าเบี้ยประกันภัย	1,401.87		
			2580	001 เงินค่าเช่า	150.46		
			1000	001 เงินสดในมือ			2,649.83
0000207 ย-006		บริษัท 785-C	5834	002 ค่าใช้จ่ายในการเดินทาง	125.00		
			5024	002 ค่าเบี้ยประกันภัย	3,064.48		
			2580	001 เงินค่าเช่า	203.67		
			1000	001 เงินสดในมือ			3,393.15
0000208 ย-007		เงินสดย่อย-C	5836	003 ค่าใบรับยกย่อง	262.00		
			5820	003 ค่าของใช้สำนักงาน	340.00		
			5842	003 ค่าธรรมเนียมและค่าอื่น ๆ	250.00		
			1000	001 เงินสดในมือ			852.00

Figure A.6. Daily Petty Cash Book Report.

บัญชีรายวัน
บัญชีแยกประเภท
วันที่ 31/01/2545

หน้า 1

วันที่	รายการ	เลขที่เอกสาร	อ้างถึง	รายละเอียด	เดบิต	เครดิต
03/01/45	0000267	ร-001		ยอดคงค้าง	5,298.81	0.00
04/01/45	0000268	ร-002		ยอดคงค้าง	2,300.00	
	0000269	ร-003		ยอดคงค้าง	500.00	
				รายได้อื่น ๆ	1,712.00	
	0000270	ร-004		ยอดคงค้าง	100.00	
				รายได้อื่น ๆ	802.50	
	0000271	ร-005		ยอดคงค้าง	100.50	
				รายได้อื่น ๆ	2,145.35	
	0000272	ร-006		ยอดคงค้าง	99.65	
				รายได้อื่น ๆ	321.00	
	0000273	ร-007		ยอดคงค้าง	108.00	
08/01/45	0000280	ร-014		ยอดคงค้าง	4,524.00	
09/01/45	0000284	ร-018		ยอดคงค้าง	710.00	
11/01/45	0000202	บ-001		ค่าของใช้สำนักงาน	810.00	
				ค่าของใช้สำนักงาน		10.00
	0000203	บ-002		ค่าโฆษณา		10.00
				ค่าโฆษณา		20.00
				ค่าโฆษณา		20.00
	0000204	บ-003		ค่าโฆษณา		1,097.20
	0000205	บ-004		ค่าโฆษณา		120.00
				ค่าโฆษณา		460.00
	0000206	บ-005		ค่าโฆษณา		1,097.50
				ค่าโฆษณา		1,401.87
				ค่าโฆษณา		150.46
	0000207	บ-006		ค่าโฆษณา		125.00
				ค่าโฆษณา		3,064.48
				ค่าโฆษณา		203.67
	0000208	บ-007		ค่าโฆษณา		262.00
				ค่าโฆษณา		340.00
				ค่าโฆษณา		250.00

Figure A.7. General Ledger Accounts.

รายงานภาษีซื้อ
 ปีที่ 2545

หน้า 1

ผู้มีสิทธิลดหย่อน : บริษัท ขนส่งไทย จำกัด
 ผู้ประกอบการ : บริษัท ขนส่งไทย จำกัด

เลขประจำตัวผู้เสียภาษี 3101197525
 [X] สำเนาภาษี [] สำเนา [0000]

ลำดับ	ใบกำกับภาษี วันที่ เดือน ปี เลขที่/เลขที่	ชื่อผู้ซื้อสินค้า / ผู้รับบริการ	อัตราภาษี มูลค่าเพิ่ม	มูลค่าสินค้า หรือค่าบริการ	จำนวนเงินภาษี มูลค่าเพิ่ม
0000001	28/12/44 012/1	บมจ. กรุงเทพประกันภัย	7.00	424.00	29.68
0000002	01/01/45 029/1	บมจ. จี. เอส. ดี. เอส. จำกัด	7.00	6,489.72	454.28
0000003	02/01/45 077/1	บ. เสด็จฯ จก.	7.00	467.29	32.71
0000004	03/01/45 009/1	บ. สยามนิคมอุตสาหกรรม จก.	7.00	827.76	57.94
0000005	078/1	บ. เอส. เอ. เอส. จำกัด	7.00	712.50	49.88
0000006	079/1	บ. นวัตกรรม เซลล์เยลลี่ จำกัด	7.00	147.67	10.34
0000007	080/1	บ. นวัตกรรม เซลล์เยลลี่ จำกัด	7.00	399.07	27.93
0000008	081/1	บ. นวัตกรรม เซลล์เยลลี่ จำกัด	7.00	494.58	34.62
0000009	082/1	บ. นวัตกรรม จก.	7.00	747.66	52.34
0000010	128/1	บ. นวัตกรรม เซลล์เยลลี่ จำกัด	7.00	179.45	12.56
0000011	04/01/45 001/1	บ. เอส. เอส. จำกัด	7.00	5,299.00	370.93
0000012	008/1	กรมศุลกากร	7.00	3,728.57	261.00
0000013	07/01/45 002/1	บ. เอส. เอส. จำกัด	7.00	13,012.45	910.87
0000014	003/1	บ. เอส. เอส. จำกัด	7.00	1,260.00	88.20
0000015	010/1	กรมศุลกากร	7.00	174,242.86	12,197.00
0000016	011/1	บ. เอส. เอส. จำกัด	7.00	662.50	46.38
0000017	028/1	บ. เอส. เอส. จำกัด	7.00	7,280.37	509.63
0000018	030/1	บ. เอส. เอส. จำกัด	7.00	2,409.20	168.64
0000019	031/1	บ. เอส. เอส. จำกัด	7.00	2,760.00	193.20
0000020	083/1	บ. เอส. เอส. จำกัด	7.00	206.50	14.46
0000021	084/1	บ. เอส. เอส. จำกัด	7.00	541.00	37.87
0000022	085/1	บ. เอส. เอส. จำกัด	7.00	467.29	32.71
0000023	086/1	บ. เอส. เอส. จำกัด	7.00	408.00	28.56
0000024	08/01/45 004/1	บ. เอส. เอส. จำกัด	7.00	2,600.00	182.00
0000025	005/1	บ. เอส. เอส. จำกัด	7.00	4,386.00	307.02
0000026	013/1	บ. เอส. เอส. จำกัด	7.00	12,500.00	875.00
0000027	087/1	บ. เอส. เอส. จำกัด	7.00	600.00	42.00
0000028	088/1	บ. เอส. เอส. จำกัด	7.00	1,050.00	73.50
0000029	089/1	บ. เอส. เอส. จำกัด	7.00	467.29	32.71

Figure A.8. Purchase Tax Report.

วันที่ : 25/01/45
สถานที่ : กรุงเทพมหานคร

เลขที่ : 3101197525
[X] []

เลขที่	วันที่	เลขที่	ชื่อลูกค้า / ห้างร้าน	จำนวน	ราคา	ภาษี
0000001	02/01/45	4469	ก.ก.	7.00	4,299.07	300.93
0000002		4469	ก.ก.	7.00	(4,299.07)	(300.93)
0000003		4470	ก.ก. 19.000.00	7.00	2,149.53	150.47
0000004		4471	ก.ก. 1.600.00	7.00	1,600.00	112.00
0000005		4472	ก.ก.	7.00	1,600.00	112.00
0000006		4472	ก.ก.	7.00	(1,600.00)	(112.00)
0000007		4473	ก.ก. 1.600.00	7.00	750.00	52.50
0000008		4474	ก.ก.	7.00	300.00	21.00
0000009		4474	ก.ก.	7.00	(300.00)	(21.00)
0000010	03/01/45	4475	ก.ก. 1.600.00	7.00	2,005.00	140.35
0000011		4476	ก.ก. 12,350.00	7.00	12,350.00	864.50
0000012		4477	ก.ก.	7.00	300.00	21.00
0000013		4477	ก.ก.	7.00	(300.00)	(21.00)
0000014		4478	ก.ก. 300.00	7.00	300.00	21.00
0000015		4479	ก.ก. 19,626.17	7.00	19,626.17	1,373.83
0000016	04/01/45	4480	ก.ก. 92,990.65	7.00	92,990.65	6,509.35
0000017		4481	ก.ก. 467.29	7.00	467.29	32.71
0000018		4482	ก.ก. 1,450.00	7.00	1,450.00	101.50
0000019		4483	ก.ก. 1,800.00	7.00	1,800.00	126.00
0000020		4484	ก.ก. 1,100.00	7.00	1,100.00	77.00
0000021		4485	ก.ก. 3,364.49	7.00	3,364.49	235.51
0000022		4485	ก.ก. (3,364.49)	7.00	(3,364.49)	(235.51)
0000023		4486	JOHN HOLLAND ASIA LTD. - MAMPRASET	7.00	5,310.00	371.70
0000024	07/01/45	4487	ก.ก. 11,682.24	7.00	11,682.24	817.76
0000025		4488	ก.ก. 3,000.00	7.00	3,000.00	210.00
0000026		4489	ก.ก. 579.44	7.00	579.44	40.56
0000027	08/01/45	4490	ก.ก. 2,000.00	7.00	2,000.00	140.00
0000028	09/01/45	4491	ก.ก. 32,000.00	7.00	32,000.00	2,240.00
0000029		4492	ก.ก. 17,350.00	7.00	17,350.00	1,214.50

Figure A.9. Sales Tax Report.

บริษัท วิชั่นเทคโนโลยี จำกัด

งบทดลอง

ประจำปี 1

พ.ศ. 31/01/2545

หน้า 1

เลขบัญชี	ชื่อบัญชี	เดบิต	เครดิต
1000	เงินสดในมือ	20,000.00	
1013	เงินฝากธนาคาร - กรุงไทย	4,461.50	
1015	เงินฝากธนาคาร - กรุงไทย (สาขาย่อยราม)	302,412.35	
1200	ลูกหนี้การค้า	6,002,216.69	
1290	ค่าเผื่อหนี้สงสัยจะสูญ		634,047.47
1430	สินค้าคงเหลือ	8,993,404.04	
1440	ค่าเผื่อการตีราคาสินค้าคงคลัง		600,518.86
1520	เงินทดรองจ่าย	724,995.21	
1530	ค่าใช้จ่ายล่วงหน้า	103,575.42	
1540	ภาษีเงินได้หัก ณ ที่จ่าย	21,908.35	
1560	รายได้ค้างรับ	59,064.00	
1570	เงินประกันผลงาน	269,219.63	
1590	ลูกหนี้อื่น ๆ	7,315.00	
1800	ที่ดิน	180,000.00	
1820	อาคาร	1,500,000.00	
1821	เครื่องตกแต่งสำนักงาน	714,351.06	
1830	เครื่องใช้สำนักงาน	2,022,480.98	
1831	เครื่องมือ เครื่องใช้	452,770.19	
1840	ยานพาหนะ	9,091,374.59	
1850	ค่าเสื่อมราคาสะสม-อาคาร		1,356,250.00
1851	ค่าเสื่อมราคาสะสม-เครื่องตกแต่งสำนักงาน		709,807.53
1860	ค่าเสื่อมราคาสะสม-เครื่องใช้สำนักงาน		1,786,905.98
1861	ค่าเสื่อมราคาสะสม-เครื่องมือ เครื่องใช้		412,047.62
1870	ค่าเสื่อมราคาสะสม-ยานพาหนะ		3,050,691.63
1900	บัญชีเงินฝากเงินประกัน	1,330,955.53	
1902	ภาษีเงินได้บุคคลธรรมดา-ไว้เก็บ	1,189,971.13	
1904	ดอกเบี้ยเข้าของค้ำประกัน	877,189.20	
1990	สินทรัพย์อื่น	133,237.56	
2000	เงินเบิกเกินบัญชี - ธนาคารพาณิชย์		754,559.58
2010	เงินเบิกเกินบัญชี - ธนาคารกรุงไทย		1,854,826.27
2050	เงินกู้ยืมจากธนาคาร		475,000.00
2100	เจ้าหนี้การค้า		146,791.34
2110	ค่าเงินจ่าย		1,425,206.56
2120	ค่าสัญญาใช้เงินจ่าย		1,670,000.00

Figure A.10. Trial Balance.

แผนก : ทีวีวงจรปิด

สินค้าคงเหลือต้นงวด		4,641,551.82
ซื้อสินค้าต่างประเทศ	263,748.44	
ซื้อสินค้าในประเทศ	7,280.37	
ซื้ออุปกรณ์ติดตั้งและอะไหล่	5,985.20	
ค่าระวาง	(24,067.41)	
ค่าประกันภัย	(1,613.00)	
บวก ค่าภาษีอากรขาเข้า	(110,669.00)	
ค่าใช้จ่ายออกของ	(12,788.50)	
ค่าแรงติดตั้ง	7,000.00	
ข้อสุทธิ		134,876.10
สินค้าคงสิ้นหมีเพื่อขาย		4,776,427.92
หัก สินค้าคงเหลือปลายงวด		2,596,151.80
ต้นทุนสินค้าที่ขาย		2,180,276.12

Figure A.11. Cost of Sales Statement - CCTV.

บริษัท วิชั่น เทคโนโลยี จำกัด
 บัญชีต้นทุนขาย
 สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 3

แนบ : วิทยุสื่อสาร

สินค้าคงเหลือต้นงวด		4,351,852.22
ซื้อสินค้าต่างประเทศ	47,768.40	
ซื้ออุปกรณ์ติดตั้งและอะไหล่	(680,938.13)	
ค่าระหว่าง	(3,143.00)	
ค่าประกันภัย	(303.00)	
บวก ค่าภาษีอากรขาเข้า	(6,931.00)	
ค่าใช้จ่ายออกของ	(3,760.00)	
ค่าแรงติดตั้ง	(240,000.00)	
ข้อสุทธิ		(887,306.73)
สินค้าคงเหลือสิ้นงวด		3,464,545.49
หัก สินค้าคงเหลือปลายงวด		4,410,802.17
ต้นทุนสินค้าขาย		(946,256.68)

Figure A.12. Cost of Sales Statement - Radio Transceiver.

บริษัท วิชั่น เทคโนโลยี จำกัด
บัญชีต้นทุนขาย
สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 1

แผนก :

สินค้าคงเหลือต้นงวด		8,993,404.04
ซื้อสินค้าต่างประเทศ	311,516.84	
ซื้อสินค้าในประเทศ	7,280.37	
ซื้ออุปกรณ์ติดตั้งและอะไหล่	(674,952.93)	
ค่าระวาง	(27,210.41)	
ค่าประกันภัย	(1,916.00)	
บวก ค่าภาษีอากรขาเข้า	(117,600.00)	
ค่าใช้จ่ายออกของ	(16,548.50)	
ค่าแรงติดตั้ง	(233,000.00)	
ข้อสุทธิ		(752,430.63)
สินค้าทั้งสิ้นเพื่อขาย		8,240,973.41
หัก สินค้าคงเหลือปลายงวด		7,006,953.97
ต้นทุนสินค้าขาย		1,234,019.44

Figure A.13. Consolidated Cost of Sales Statement.

บริษัท วิชั่น เทคโนโลยี จำกัด
งบกำไรขาดทุน (Single-Step)
สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 2

แผนก : ทิววงจรมืด

รายได้ :		
ขาย	964,766.21	
กำไรจากอัตราแลกเปลี่ยน	11,803.46	
ดอกเบี้ยรับ	6,629.72	
รายได้อื่น ๆ	0.01	
รวมรายได้		983,199.40
ค่าใช้จ่าย :		
ต้นทุนขาย	2,180,276.12	
ค่ารับรอง	870.00	
ค่านายหน้าพนักงานขาย	(100,000.00)	
ค่านายหน้าบุคคลภายนอก	(130,000.00)	
เงินเดือนและค่าจ้าง	219,508.00	
เงินสมทบกองทุน เงินทดแทน	850.11	
ค่าโทรศัพท์	168.92	
ค่าเบี้ยประกันภัย	8,276.50	
ค่าयोगใช้สำนักงาน	2,173.31	
ค่าเสื่อมราคา	56,605.65	
ค่าตอบบัญชี	(8,250.00)	
ค่าน้ำมันรถบริษัท	10,668.69	
ค่าซ่อมแซมยานพาหนะ	2,500.70	
ค่าภาษีรถยนต์	2,016.00	
ค่าใช้จ่ายในการเดินทาง	2,927.50	
ค่าโฆษณา ค่าขนส่ง	85.00	
ค่าธรรมเนียมธนาคาร	22,092.65	
ค่าธรรมเนียมและภาษีอากรอื่นๆ	1,040.00	
ค่าใช้จ่ายเบ็ดเตล็ด	15.70	
ขาดทุนจากอัตราแลกเปลี่ยน	1,026.81	
ดอกเบี้ยจ่ายธนาคาร	32,038.45	
ดอกเบี้ยเข้าซื้อ	8,186.51	
ดอกเบี้ยจ่ายอื่น ๆ	6,775.72	
รวมค่าใช้จ่าย		2,319,852.34
กำไรก่อนรายการพิเศษ		(1,336,652.94)
กำไรสุทธิ		(1,336,652.94)
		=====

Figure A.14. Income Statement - CCTV.

บริษัท วิชั่นเทคโนโลยี จำกัด
งบกำไรขาดทุน (Single-step)
สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 3

แผนก : วิทยุสื่อสาร

รายได้ :		
ขาย	240,091.21	
กำไรจากอัตราแลกเปลี่ยน	20.48	
ดอกเบี้ยรับ	(1,295.86)	
รายได้อื่น ๆ	900.20	
รวมรายได้		239,716.03
ค่าใช้จ่าย :		
ต้นทุนขาย	(946,256.68)	
ค่าโฆษณา	11,745.00	
ค่าขายหน้าบุคคลภายนอก	2,020.00	
เงินเดือนและค่าจ้าง	182,287.00	
เงินสมทบกองทุนเงินทดแทน	850.11	
ค่าสวัสดิการ	1,000.00	
ค่าโทรศัพท์	(295.08)	
ค่าเบี้ยประกันภัย	11,773.50	
ค่าของใช้สำนักงาน	4,313.84	
ค่าเสื่อมราคา	79,498.65	
ค่าสอยบัญชี	(8,250.00)	
ค่าน้ำมันรถบริษัท	11,961.21	
ค่าซ่อมแซมยานพาหนะ	4,822.15	
ค่าภาษีรถยนต์	1,112.00	
ค่าใช้จ่ายในการเดินทาง	767.50	
ค่าโฆษณาคร ค่าขนส่ง	1,652.00	
ค่าธรรมเนียมธนาคาร	2,657.06	
ค่าธรรมเนียมและภาษีอากรอื่นๆ	670.00	
ค่าใช้จ่ายเขตติดต่อ	2,000.00	
รายจ่ายอื่น ๆ	21.00	
ดอกเบี้ยจ่ายธนาคาร	13,429.15	
ดอกเบี้ยเข้าซื้อ	13,933.38	
ดอกเบี้ยจ่ายอื่น ๆ	3,000.00	
รวมค่าใช้จ่าย		(605,288.21)
กำไรก่อนรายการพิเศษ		845,004.24
กำไรสุทธิ		845,004.24

Figure A.15. Income Statement - Radio Transceiver.

บริษัท วิชั่นเทคโนโลยี จำกัด
งบกำไรขาดทุน (Single-Step)
สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 1

แผนก :

รายได้ :

ขาย	1,204,857.42	
กำไรจากอัตราแลกเปลี่ยน	11,823.94	
ดอกเบี้ยรับ	5,333.86	
รายได้อื่น ๆ	900.21	
รวมรายได้		1,222,915.43

ค่าใช้จ่าย :

ต้นทุนขาย	1,234,019.44	
ค่าโฆษณา	11,745.00	
ค่ารับรอง	870.00	
ค่านายหน้าพนักงานขาย	(100,000.00)	
ค่านายหน้าบุคคลภายนอก	(127,980.00)	
เงินเดือนและค่าจ้าง	401,795.00	
เงินสมทบกองทุน เงินทดแทน	1,700.22	
ค่าสวัสดิการ	1,000.00	
ค่าโทรศัพท์	(126.16)	
ค่าเบี้ยประกันภัย	20,050.00	
ค่าของใช้สำนักงาน	6,487.15	
ค่าเสื่อมราคา	136,104.30	
ค่าสอบบัญชี	(16,500.00)	
ค่าโฆษณาบริษัท	22,629.90	
ค่าซ่อมแซมยานพาหนะ	7,322.85	
ค่าภาษีรถยนต์	3,128.00	
ค่าใช้จ่ายในการเดินทาง	3,695.00	
ค่าโฆษณาการ ค่าขนส่ง	1,737.00	
ค่าธรรมเนียมธนาคาร	24,749.71	
ค่าธรรมเนียมและภาษีอากรอื่นๆ	1,710.00	
ค่าใช้จ่ายเบ็ดเตล็ด	2,015.70	
ขาดทุนจากอัตราแลกเปลี่ยน	1,026.81	
รายจ่ายอื่น ๆ	21.00	
ดอกเบี้ยจ่ายธนาคาร	45,467.60	
ดอกเบี้ยเช่าซื้อ	22,119.89	
ดอกเบี้ยจ่ายอื่น ๆ	9,775.72	
รวมค่าใช้จ่าย		1,714,564.13

กำไรก่อนรายการพิเศษ

(491,648.70)

กำไรสุทธิ

(491,648.70)

Figure A.16. Consolidated Income Statement.

สินทรัพย์	
สินทรัพย์หมุนเวียน :	
เงินสดในมือ	20,000.00
เงินฝากธนาคาร - กรุงเทพ	4,461.50
เงินฝากธนาคาร - กรุงเทพ (สาขาย่อยรวม)	302,412.35
ลูกหนี้การค้า	6,002,216.69
หัก ค่าเผื่อหนี้สงสัยจะสูญ	634,047.47
ลูกหนี้การค้าและตัวเงินรับสุทธิ	5,368,169.22
สินค้าคงเหลือ	7,006,953.97
ค่าเผื่อการตีราคาสินค้าลดลง	(600,518.86)
เงินทดรองจ่าย	724,995.21
ค่าใช้จ่ายล่วงหน้า	103,575.42
ภาษีเงินได้หัก ณ ที่จ่าย	21,908.35
รายได้ค้างรับ	59,064.00
เงินประกันผลงาน	269,219.63
ลูกหนี้อื่นๆ	7,315.00
รวมสินทรัพย์หมุนเวียน	13,287,555.79
ที่ดิน อาคารและอุปกรณ์ :	
ที่ดิน	180,000.00
อาคาร	1,500,000.00
เครื่องตกแต่งสำนักงาน	714,351.06
เครื่องใช้สำนักงาน	2,022,480.98
เครื่องมือ เครื่องใช้	452,770.19
ยานพาหนะ	9,091,374.59
หัก ค่าเสื่อมราคาสะสม-อาคาร	1,356,250.00
ค่าเสื่อมราคาสะสม-เครื่องตกแต่งสำนักงาน	709,807.53
ค่าเสื่อมราคาสะสม-เครื่องใช้สำนักงาน	1,786,905.98
ค่าเสื่อมราคาสะสม-เครื่องมือ เครื่องใช้	412,047.62
ค่าเสื่อมราคาสะสม-ยานพาหนะ	3,050,691.63
ที่ดิน อาคารและอุปกรณ์สุทธิ	6,645,274.06
บัญชีเงินฝากเป็นประกัน	1,330,955.53
ภาษีเงินได้นิติบุคคลชำระไว้เกิน	1,189,971.13
ดอกเบี้ยเข้าซื้ออสังหาริมทรัพย์	877,189.20
สินทรัพย์อื่น	133,237.56
รวมสินทรัพย์	23,464,183.27

Figure A.17. Balance Sheet - Assets.

หนี้สินและส่วนของผู้ถือหุ้น	
หนี้สินหมุนเวียน :	
เงินเบิกเกินบัญชี - ธนาคารทหารไทย	754,559.58
เงินเบิกเกินบัญชี - ธนาคารกรุงเทพ	1,854,826.27
เงินกู้ยืมจากธนาคาร	475,000.00
เจ้าหนี้การค้า	146,791.34
ตัวเงินจ่าย	1,425,206.56
ตัวสัญญาใช้เงินจ่าย	1,670,000.00
เงินมัดจำรับ	19,626.17
ภาษีมูลค่าเพิ่มค้างจ่าย	64,916.72
เจ้าหนี้ภาษีหัก 5 หักจ่าย	38,338.69
เงินทดรองรับ	45,446.65
เจ้าหนี้ภาษีซื้อ	103,805.92
เจ้าหนี้อื่น ๆ	1,081,994.22
รวมหนี้สินหมุนเวียน	7,680,512.12
เจ้าหนี้เข้าซื้อ	4,872,051.62
รวมหนี้สิน	12,552,563.74
ส่วนของผู้ถือหุ้น :	
ทุนเรือนหุ้น	
หุ้นออกและเรียกชำระแล้ว	7,600,000.00
กำไรสะสม	
กำไรสะสมจัดสรรแล้ว สำนองตามกฎหมาย	760,000.00
กำไรสะสมจัดสรรแล้ว สำนองอื่น ๆ	0.00
กำไรสะสมยังไม่ได้จัดสรร	3,043,268.23
กำไรขาดทุน	(491,648.70)
รวมส่วนของผู้ถือหุ้น	10,911,619.53
รวมหนี้สินและส่วนของผู้ถือหุ้น	23,464,183.27

Figure A.18. Balance Sheet - Liabilities & Owner's Equity.

บริษัท วิชั่น เทคโนโลยี จำกัด
งบกำไรขาดทุน (เปรียบเทียบงวดเดียวกันของปีก่อน)
สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 2

แผนก : ทิวังจระบิต

รายการ	ข้อมูลปัจจุบัน	ข้อมูลปีที่แล้ว
รายได้ :		
ขาย	964,766.21	736,230.24
กำไรจากอัตราแลกเปลี่ยน	11,803.46	106.31
ดอกเบี้ยรับ	6,629.72	(1,292.99)
รายได้อื่น ๆ	0.01	1,502.82
รวมรายได้	983,199.40	736,546.38
ค่าใช้จ่าย :		
ต้นทุนขาย	2,180,276.12	418,681.70
ค่ารับรอง	870.00	772.00
ค่านายหน้าพนักงานขาย	(100,000.00)	0.00
ค่านายหน้าบุคคลภายนอก	(130,000.00)	0.00
เงินเดือนและค่าจ้าง	219,508.00	199,031.50
เงินสมทบกองทุน เงินทดแทน	850.11	1,140.35
ค่าโทรศัพท์	168.92	552.19
ค่าเบี้ยประกันภัย	8,276.50	6,889.50
ค่าเช่า	0.00	2,000.00
ค่าของใช้สำนักงาน	2,173.31	4,187.83
ค่าเสื่อมราคา	56,605.65	65,067.14
ค่าสอบบัญชี	(8,250.00)	(7,500.00)
ค่าน้ำมันรถบริษัท	10,668.69	18,537.20
ค่าซ่อมแซมยานพาหนะ	2,500.70	15,449.82
ค่าภาษีรถยนต์	2,016.00	1,265.00
ค่าใช้จ่ายในการเดินทาง	2,927.50	2,028.49
ค่าโฆษณาการ ค่าขนส่ง	85.00	79.00
ค่าธรรมเนียมธนาคาร	22,092.65	4,246.39
ค่าธรรมเนียมและภาษีอากรอื่นๆ	1,040.00	50.00
ค่าใช้จ่ายเบ็ดเตล็ด	15.70	(764.91)
ขาดทุนจากอัตราแลกเปลี่ยน	1,026.81	0.00
รายจ่ายอื่น ๆ	0.00	2.50
ดอกเบี้ยจ่ายธนาคาร	32,038.45	10,883.81
ดอกเบี้ยเช่าซื้อ	8,186.51	5,380.38
ดอกเบี้ยจ่ายอื่น ๆ	6,775.72	3,000.00
รวมค่าใช้จ่าย	2,319,852.34	750,979.89
กำไรก่อนรายการพิเศษ	(1,336,652.94)	(14,433.51)
กำไรสุทธิ	(1,336,652.94)	(14,433.51)

Figure A.19. Income Statement (compared with same period last year) - CCTV.

บริษัท วิชั่น เทคโนโลยี จำกัด
งบกำไรขาดทุน (เปรียบเทียบกัปีงวดเดียวกันของปีก่อน)
สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 4

แผนก : วิทยุสื่อสาร

รายการ	ข้อมูลปัจจุบัน	ข้อมูลปีแล้ว
รายได้ :		
ขาย	240,091.21	3,182,819.93
กำไรจากอัตราแลกเปลี่ยน	20.48	43.56
ดอกเบี้ยรับ	(1,295.86)	(1,292.98)
รายได้อื่น ๆ	900.20	1,904.17
รวมรายได้	239,716.03	3,183,474.68
ค่าใช้จ่าย :		
ต้นทุนขาย	(946,256.68)	1,403,270.08
ค่าโฆษณา	11,745.00	0.00
ค่ารับรอง	0.00	3,131.00
ค่านายหน้าบุคคลภายนอก	2,020.00	20,000.00
เงินเดือนและค่าจ้าง	182,287.00	189,189.50
เงินสมทบกองทุนเงินทดแทน	850.11	1,140.35
ค่าสวัสดิการ	1,000.00	0.00
ค่าโทรศัพท์	(295.08)	(690.82)
ค่าเบี้ยประกันภัย	11,773.50	2,630.50
ค่าเครื่องเขียนแบบพิมพ์	0.00	12.00
ค่าของใช้สำนักงาน	4,313.84	5,987.82
ค่าเสื่อมราคา	79,498.65	8,351.13
ค่าสอบบัญชี	(8,250.00)	(7,500.00)
ค่าน้ำมันรถบริษัท	11,961.21	8,950.74
ค่าซ่อมแซมยานพาหนะ	4,822.15	16,676.41
ค่าภาษีรถยนต์	1,112.00	1,060.00
ค่าใช้จ่ายในการเดินทาง	767.50	8,438.50
ค่าไปรษณียากร ค่าขนส่ง	1,652.00	971.50
ค่าธรรมเนียมธนาคาร	2,657.06	7,642.22
ค่าธรรมเนียมและภาษีอากรอื่น ๆ	670.00	250.00
ค่าใช้จ่ายเบ็ดเตล็ด	2,000.00	5,948.10
ขาดทุนจากอัตราแลกเปลี่ยน	0.00	1,454.35
รายจ่ายอื่น ๆ	21.00	2.53
ดอกเบี้ยจ่ายธนาคาร	13,429.15	12,345.49
ดอกเบี้ยเข้าซื้อ	13,933.38	0.00
ดอกเบี้ยจ่ายอื่น ๆ	3,000.00	3,000.00
รวมค่าใช้จ่าย	(605,288.21)	1,692,261.40
กำไรก่อนรายการพิเศษ	845,004.24	1,491,213.28
กำไรสุทธิ	845,004.24	1,491,213.28

Figure A.20. Income Statement (compared with same period last year) - Radio.

บริษัท วิชั่น เทคโนโลยี จำกัด
งบกำไรขาดทุน (เปรียบเทียบปีงวดเดียวกันของปีก่อน)
สำหรับงวด สิ้นสุดวันที่ 31/01/2545

หน้า 1

แผนก :

รายการ	ข้อมูลปัจจุบัน	ข้อมูลปีที่แล้ว
รายได้ :		
ขาย	1,204,857.42	3,919,050.17
กำไรจากอัตราแลกเปลี่ยน	11,823.94	149.87
ดอกเบี้ยรับ	5,333.86	(2,585.97)
รายได้อื่น ๆ	900.21	3,406.99
รวมรายได้	1,222,915.43	3,920,021.06
ค่าใช้จ่าย :		
ต้นทุนขาย	1,234,019.44	1,821,951.78
ค่าโฆษณา	11,745.00	0.00
ค่ารับรอง	870.00	3,903.00
ค่านายหน้าพนักงานขาย	(100,000.00)	0.00
ค่านายหน้าบุคคลภายนอก	(127,980.00)	20,000.00
เงินเดือนและค่าจ้าง	401,795.00	388,221.00
เงินสมทบกองทุนเงินทดแทน	1,700.22	2,280.70
ค่าสวัสดิการ	1,000.00	0.00
ค่าโทรศัพท์	(126.16)	(138.63)
ค่าเบี้ยประกันภัย	20,050.00	9,520.00
ค่าเช่า	0.00	2,000.00
ค่าเครื่องเขียนแบบพิมพ์	0.00	12.00
ค่าของใช้สำนักงาน	6,487.15	10,175.65
ค่าเสื่อมราคา	136,104.30	73,418.27
ค่าสอบบัญชี	(16,500.00)	(15,000.00)
ค่าน้ำมันรถยนต์	22,629.90	27,487.94
ค่าซ่อมแซมยานพาหนะ	7,322.85	32,126.23
ค่าภาษีรถยนต์	3,128.00	2,325.00
ค่าใช้จ่ายในการเดินทาง	3,695.00	10,466.99
ค่าโฆษณาการ ค่าขนส่ง	1,737.00	1,050.50
ค่าธรรมเนียมธนาคาร	24,749.71	11,888.61
ค่าธรรมเนียมและภาษีอากรอื่น ๆ	1,710.00	300.00
ค่าใช้จ่ายเบ็ดเตล็ด	2,015.70	5,183.19
ขาดทุนจากอัตราแลกเปลี่ยน	1,026.81	1,454.35
รายจ่ายอื่น ๆ	21.00	5.03
ดอกเบี้ยจ่ายธนาคาร	45,467.60	23,229.30
รวมค่าใช้จ่าย	1,714,564.13	2,443,241.29
กำไรก่อนรายการพิเศษ	(491,648.70)	1,476,779.77
กำไรสุทธิ	(491,648.70)	1,476,779.77

Figure A.21. Consolidated Income Statement (compared with same period last year).

บริษัท วิชั่น เทคโนโลยี จำกัด
 รายงานวิเคราะห์อัตราส่วนทางการเงิน
 ประจำปี 2561

Liquidity Ratios :		
Current ratio	:	1.73 times
Quick ratio	:	0.90 times
Activity Ratios :		
Receivable turnover	:	0.22 times
Inventory turnover	:	0.17 times
Total asset turnover	:	0.05 times
Fixed asset turnover	:	0.18 times
Profitability Ratios :		
Profit margin on sales	:	(40.81) %
Return on total assets	:	(2.10) %
Leverage Ratios :		
Debt ratio	:	53.50 %

Figure A.22. Financial Ratio Analysis Report.

BIBLIOGRAPHY

1. Davis, Fred R. "Perceived Usefulness, Ease of Use, and User Acceptance of Information Technology," MIS Quarterly 13, no. 3, 1989.
2. Delone, William H. and Ephraim R. Mclean. "Information System Success: The Quest for the Dependent Variable," Information Systems Research 3, no. 1, 1992.
3. Gallagher, Timothy J. and Joseph D. Andrew, Jr. Financial Management, Second Edition. New Jersey: Prentice Hall, 2000.
4. Hoffer, Jeffrey A., Joey F. George, and Joseph S. Valacich. Modern Systems Analysis and Design, Second Edition. Massachusetts: Addison Wesley Longman, Inc., 1999.
5. Ives, Blake, Margrethe H. Olson, and Jack J. Baroudi. "The Measurement of User Information Satisfaction," Communications of the ACM 26, 1983
6. Laudon, Kenneth C. and Jane P. Laudon. Management Information Systems, Sixth Edition. New Jersey: Prentice Hall, 2000.
7. Lucas, Henry C., Jr. Implementation: The Key to Successful Information Systems. New York: Columbia University Press, 1981.
8. Mensching, James R. and Dennis A. Adams. Managing an Information System. New Jersey: Prentice Hall, 1991.
9. Markus, M. Lynne and Mark Keil. "If We Build It, They Will Come: Designing Information Systems That People Want to Use," Sloan Management Review, 1994.
10. Westcott, Russ. "Client Satisfaction: The Yardstick for Measuring MIS Success," Journal of Information Systems Management, 1985.