



# Analysis of an Accounting Information System

by

Ms. Kuntinee Kitwiboon

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

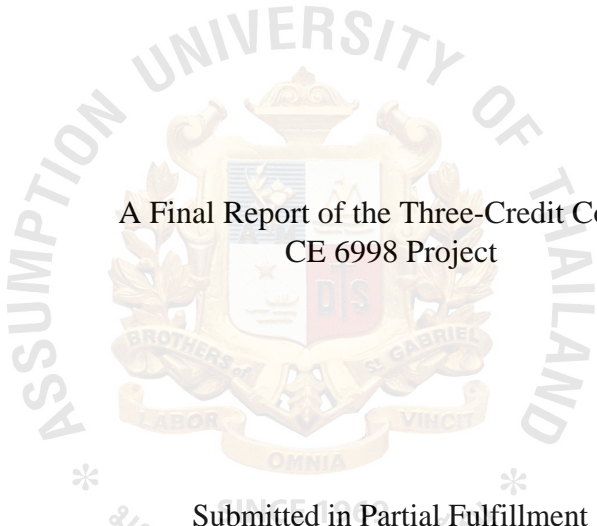
March 2000



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Project Title                      Analysis of an Accounting Information System

Name                                Ms. Kuntinee Kitwiboon

Project Advisor                  Dr. Boorapa Chodchoey

Academic Year                  March 2000

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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.

Approval Committee:

t-et,

(Dr. Boorapa Chodchoey)  
Advisor

(Prof.Dr. Srisakdi Charmonman)  
Chairman

(Dr. Chamnong un hirapanich)  
Dean and Co-advisor

(Asst.Prof.Dr. Boonmark Sirinaovakul)  
Member

(Dr. Prapon Phasukyud)  
Member

(Assoc.Prof. Somchai Thayarnyong)  
MUA Representative

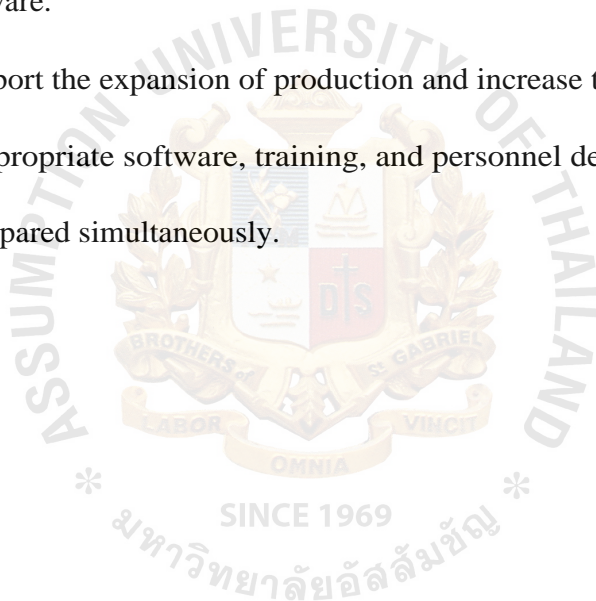
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## ABSTRACT

The Analysis of an Accounting Information System project has been developed for the Sodexho Co., Ltd. which requires to improve Computer Information System in a part of the accounting system. Furthermore, the company needs to adjust the production system that is another significant part in this organization.

A survey of past information identifies the major considerations of a new software analysis. According to requirements of users, the software analysis is applied to evaluate the best software.

To support the expansion of production and increase the efficiency in operation of users, the appropriate software, training, and personnel development in organizations should be prepared simultaneously.



## ACKNOWLEDGEMENTS

I am indebted to the following people and organizations. Without them, this project would not have been possible.

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Special appreciation is due to my sister for her fervent and continuous encouragement. Above all, I am forever grateful to her willingness that invests in my future has enabled me to achieve my educational goal.

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## TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
ABSTRACT	
ACKNOWLEDGEMENTS	ii
LIST OF FIGURES	
LIST OF TABLES	vi
I. INTRODUCTION	1
1.1 Introduction	1
1.2 Objectives	2
1.3 Scopes	3
1.4 Company Background	3
1.5 Business Profile	4
1.6 Comments about Organization	5
II. THE SYSTEM ANALYSIS	7
2.1 The Existing Business Functions	7
2.2 The Existing Computer Based Information System (CBIS)	21
2.3 Current Problems of the Organization	25
2.4 Solving the Organization's Current Problems	27
III. THE ALTERNATIVE CONSIDERATIONS	30
3.1 The Information Requirements	30
3.2 Information System Software	34
3.3 The Advantages of Software Packages	37
3.4 Selecting Software Packages	39

<u>Chapter</u>	<u>Page</u>
3.5 The Plans for Implementing Information Systems	43
3.6 Hardware and Software Requirements	43
IV. THE COMPARATIVE ANALYSIS	46
4.1 The Comparative Strategy	46
4.2 Capital Budgeting Models	46
4.3 Cash Flows	50
4.4 Selection of the Alternatives for Organization	50
4.5 Results of the Cost-Benefit Analysis	59
4.6 Consideration of the Intangible Benefit Analysis	62
4.7 Information System to Management Benefits and Problems	67
V. THE PROJECT IMPLEMENTATION	70
5.1 Management of The Implementation Process	70
5.2 The Systems Implementation	71
5.3 The Training Program	75
VI. CONCLUSIONS AND RECOMMENDATIONS	81
6.1 Conclusions	81
6.2 Recommendations	82
BIBLIOGRAPHY	86

## LIST OF FIGURES

Figure	Page
1.1 The Organization Structure	6
2.1 Data Flow Diagram: Order Entry Application System	8
2.2 Data Flow Diagram: Accounts Receivable System	10
2.3 Data Flow Diagram: Purchase Order System	11
2.4 Data Flow Diagram: Payroll System	13
2.5 Data Flow Diagram: Bank & Cheque Management System	15
2.6 Data Flow Diagram: Production Control System	18
2.7 Context Diagram: The Existing Information System	19
2.8 Data Flow Diagram: The Existing Information System	20
2.9 Network Diagram: The Existing Network System	22



## LIST OF TABLES

Table	Page
2.1 The Current Hardware and Software Configuration (Part I)	23
2.2 The Current Hardware and Software Configuration (Part II)	24
2.3 The Current Hardware and Software Configuration (Part III)	24
4.1 The Estimated Costs of Business Plus Software Package	53
4.2 The Estimated Costs of AccPac Software Package	54
4.3 The Estimated Costs of Platinum Software Package	55
4.4 The Estimated Benefits of Business Plus Software Package	58
4.5 The Estimated Benefits of AccPac Software Package	58
4.6 The Estimated Benefits of Platinum Software Package	59
4.7 The Cost-Benefit Analysis in Implementing Application Software Packages for 5 Years Period	61
4.8 The Intangible Benefits Analysis of Each Application Software Package	66
5.1 The Training Schedule Program (Part I)	79
5.2 The Training Schedule Program (Part II)	80
6.1 The Conceptual Development Plans in 5 Years Periods	84

# I. INTRODUCTION

## 1.1 Introduction

Information technologies continue to shape not only the way people perform work, but also the products that many businesses turn out and the manner in which businesses compete. Once considered only a routine cost item for most companies in their paperwork handling, information processing has become a matter of strategic importance for most of today's organizations. In addition, businesses in a variety of industries are using information technologies to both "lock in" their customers and "lock out" competitors.

The management system of a medicine production company has been investigated and analyzed to seek the points of improvement based on the use of information system. Sodexho Co., Ltd. produces various types of medicine as its products to distribute to its customers. In the past, when there were only few competitors in the market, the business of Sodexho had grown up very fast. With only 3 persons and low technology, the company has made its business grow up and get larger. After that, when more competitors entered the market, the company had to invest with higher technology on production and on larger work force to compete in this business. Today, because of limited financial support, Sodexho would not invest in any technology, which does not bring fast return to its business.

At present, the company had encountered many problems in its management. Some of the problems found in this company are low returns on profit, less productiveness, and increase in product defects. Sodexho had considered various points of improvement for example, marketing planning, production planning and control, sale

operation, stock control and accounting process. The company had invested at a certain degree in accounting system. Here, a computer network and accounting software package had been implemented but with less success.

This project is initiated to identify the problem and requirements of the management in accounting process improvement by finding the best alternative to implement the Computer based information system (CBIS) with less costs and more benefits for the company. The project should recommend the most efficient CBIS for the accounting process for Sodexho. It should also support the production expansion and management system in the future.

## 1.2 Objectives

- (1) To study the current management system of the company and identify the problems in the management and in the implementation of current accounting system.
- (2) To analyze the problems and user requirements to identify the real need of the management.
- (3) To identify the CBIS alternatives which can solve the problems on the accounting process suitable for the company.
- (4) To evaluate each alternative and compare them cost-beneficially and recommend the best alternative with the implementation plan of such alternative for the company.
- (5) To motivate all personnel in the organization by training and development programs and to improve the efficiency of the operating system and support manufacturing in the future.

responsibility of human being is expressed by managing our functions completely". This signifies his entrepreneurial spirit in managing his company for the wealth of others and he cares for those who work with full responsibility. Following his belief, the management team has stricken to the work for quality and responsibility.

### 1.5 Business Profile

Sodexho Co., Ltd. can make the sale amount to 5 million per year and has aimed to distribute 90% of medicine products to general licensed drug stores and supply the rest to hospitals from orders by doctors.

Now the company is willing to expand its market to neighboring countries such as Lao, Vietnam, Burma, and Cambodia. Also the management team try to establish its agencies in these countries. Moreover, the company tries to improve types of products and to acquire new technology to improve management and production system.

"Friendly Zoning" policy primarily emphasizes the trust from all customers to the company. It was stated that the company intends to promote relationship among the group of competitors and try to attain the highest standard production processes for best quality of medicine products. Sodexho tries to distribute its products to all regions of Thailand including neighboring countries. As the contribution to society, the company also gives donations in the form of money and medicine products to the nonprofit agencies.

Since Sodexho Co., Ltd. is a middle-sized management system, the organization is formed in a simple structure, working processes has sequentially conducted from one section to the others where implicit control mechanisms are installed in itself.



### **1.3 Scope**

- (1) Survey the current system of this company, and identify the problems in management which should be solved by using IT solution.
- (2) Emphasize on the study of accounting process and its current accounting information system to find the problems and requirement of the management.
- (3) Study current technology and find solution to improve current accounting system and use less cost alternative as possible.
- (4) Evaluate each alternative solution and compare these alternatives using economic analysis.
- (5) Propose the implementation plan of the best alternative for the accounting system including the recommendation plan for improving other management processes needed for the company.

### **1.4 Company Background**

Sodexho Co., Ltd. was established in 1957 to produce medicine products feeding the market place since 1963. At the first time, there were only 3 employees in a small drug store located in Nakornsawan. After that, the number of employees was increased and the company grew rapidly.

Because of the organization expansion, the company needed to move it's factory to a new location at Nonthaburi. The office and factory buildings were built completely and began the operation in 1985. Sodexho Co., Ltd. has produced medicine products following the GMP standard of Public Health Ministry and the standard of Food and Drug organization for over 40 years. The founder of Sodexho stated his belief that "the happiness of a human being is the success and we can recognize that success", and "the

## 1.6 Comments about Organization

Sodexho Co., Ltd. is a middle-sized organization. Its management system is comprised of three departments. Each department is managed by an executive committee which is controlled directly by the managing director. Here, the executive committee of production department has authorized quality control system to inspect raw materials from inventory stock and finished goods obtained from manufacturing system. This committee also determines the category and types of products and controls the replenishment and depletion of the inventory stock level. The executive committee for financial & administration department has responsibility to manage the personnel division in controlling the working system and timetable of all staffs, managing the administration division in all matters both inside and outside of the company. This committee also monitors the purchasing division in procurement and quality assurance of goods and raw material. In addition to the above mentioned, the committee also controls the chief accountant who manages the financial & accounting system in the financial & accounting division. The last executive committee of sale & promotion department takes care of sales analysis, management, promotion of products, customers, and market place such as how to promote the new medicine by minimum costs.

When one has studied the organization structure one will find that some part of the management system is complicating and confusing. The executive and operation systems are not completely separated. They are controlled by the executive committee instead of authorizing the managing director to manage the executive system. In part of the operation system the managing director should recruit managers to control subordinates in each department, because the decentralization system will be the best management system and easy to control. This section further illustrates in Figure 1.1.

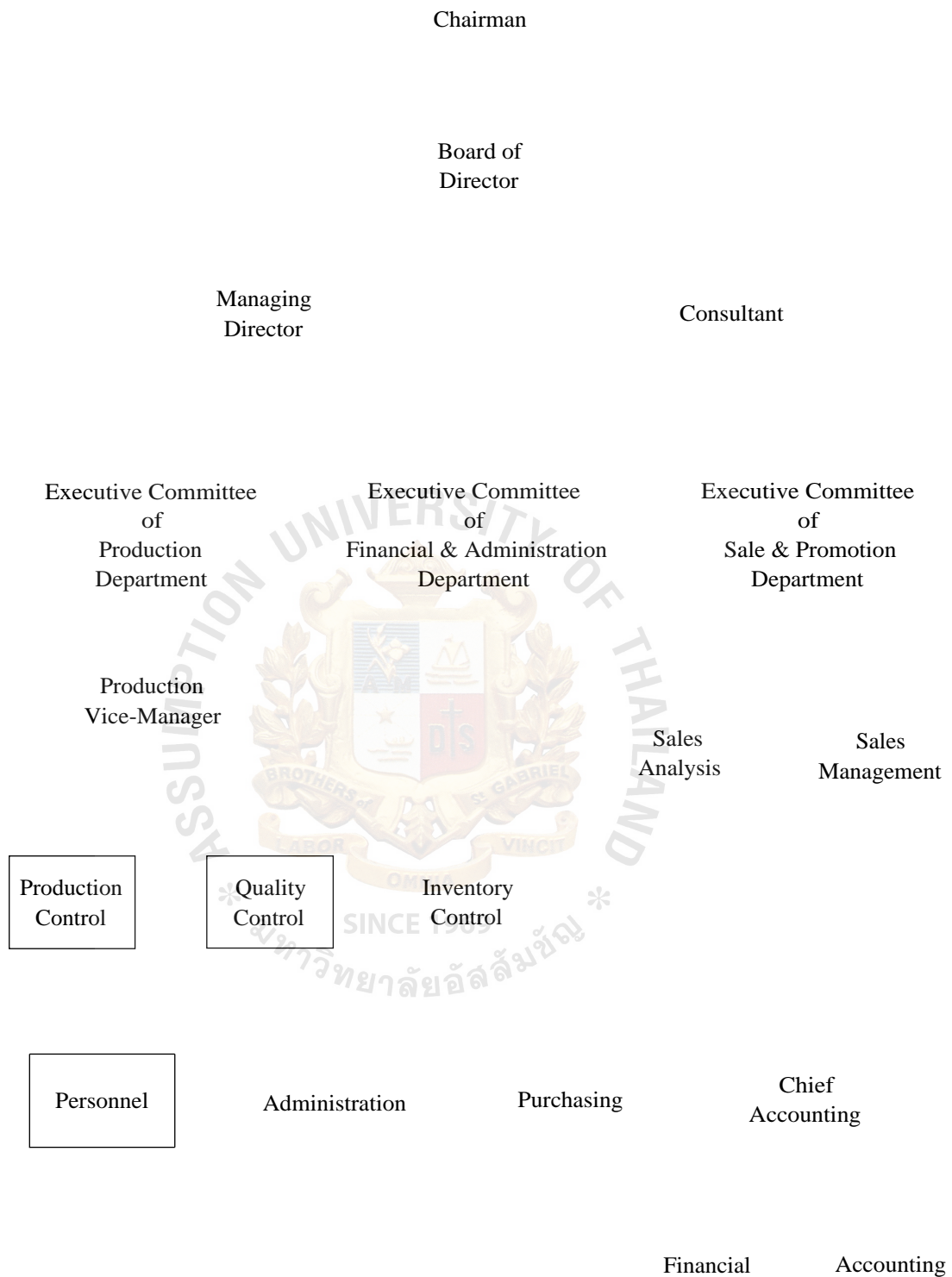


Figure 1.1. The Organization Structure.

## II. THE SYSTEM ANALYSIS

### 2.1 The Existing Business Function

The accounting information system forms a part of the larger business information system; other parts might include the management, production, and marketing information system. Each part, as well as others, is potentially concerned with both the operational and the management decision support functions. But there is no consensus on the proper role of the accounting information system (discussed later).

#### 2.1.1 Accounting Information System

The major features of the current accounting system of Sodexho Co., Ltd. are operated by the use of software system, but a few parts of them are still operating manually. These systems are as follows:

##### (1) Order Entry System

Order entry system relates to the issuance of sales order, delivery order, sales return, and transference sheets. It involves the process of accepting and delivering of customer orders and preparing invoices. The process starts with receiving the customer orders and preparing the sales order. The processed data will contain descriptions of products ordered, their prices, and descriptive data concerning the customer, such as name, delivery address, and billing address. Credit has been approved and copy of each sales order is forwarded to billing and finished goods. The invoice for a given order will be prepared and mailed to customers, then recorded in the sales journal and posting copies which are sent to accounts receivable. Billing memo copy of each sales order is forwarded to billing. Periodically, the controlled totals of posting to the accounts receivable ledger are



compared to the journal voucher that is sent to validate postings to the general ledger. Figure 2.1 illustrates a data flow diagram of an order entry application system.

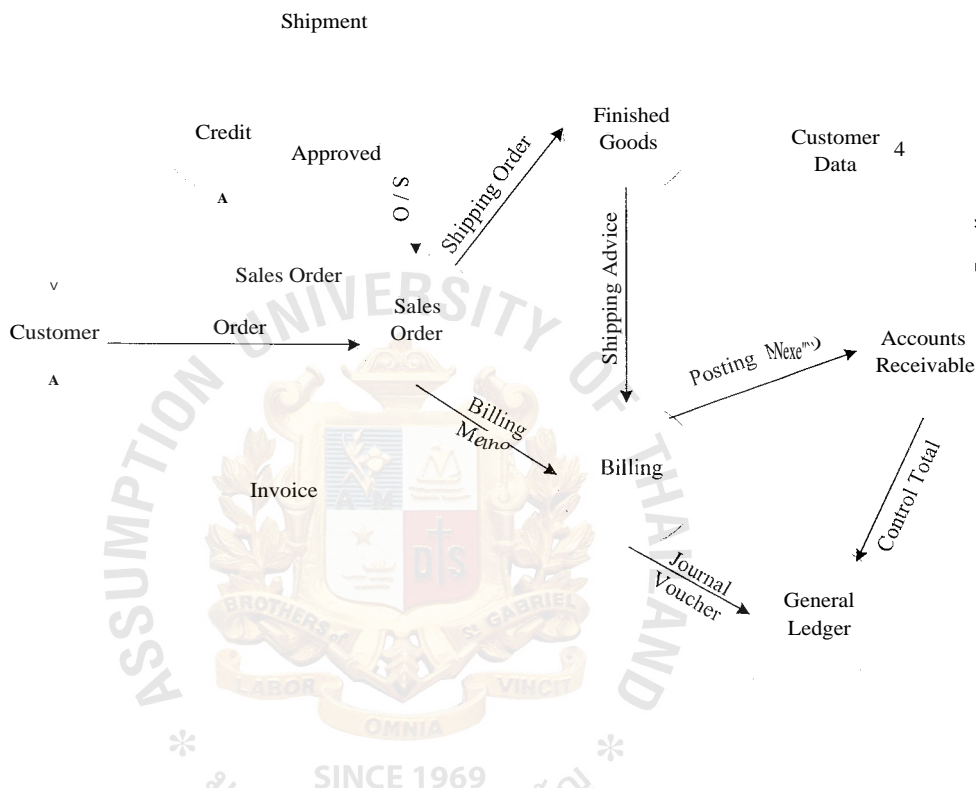


Figure 2.1. Data Flow Diagram: Order Entry Application System.

(2) The Sales Analysis System

Sales analysis system is used to analyze sales data and prepare information for management planning and control. Typically, it involves the analysis of sales data by a customer group, a product category, sales representatives, and so forth. This company separates its suppliers from its customers completely.

(3) The Sales Management System

Sales management system involves salesperson historical data, order taking, the determination of sales representative's commissions and keeps track of returned products, sale commissions and bonus to collect the sales achievement .

Program will calculate commission for each salesperson from products price excluding Vat after customer received and paid completely. It allows managers to inquire sales history, sales statistics, report of salesperson ability, and special bonus of target customers.

(4) Accounts Receivable System

Accounts receivable system involves the preparation of customer invoices, monthly statements for goods and services sold. It also involves the maintenance of accounts receivable records and the preparation of associated management reports, credit term, and condition of cash and merchandise discount.

Invoices, credit memos, and other invoice adjustments are routed to the accounts receivable system from billing function for posting to the customer accounts. Periodically, customer statements are mailed directly to customers by the accounts receivable system. Remittance advises will be forwarded with customer remittances to accounts receivable system by salesman. It includes the preparation of an aging schedules of the accounts receivable subsidiary ledger for review by credit function. Credit function also includes the approval of sales returns and allowances and other adjustments to customer accounts, the review and approval of the aging

schedules to ascertain customer's creditworthiness, and the initiation of write-off memos to charge accounts to bad-debt expense. Finally, the accounts receivable control account forwards the journal vouchers and control totals that are reconciled to the general ledger. Figure 2.2 illustrates a data flow diagram of an accounts receivable system.

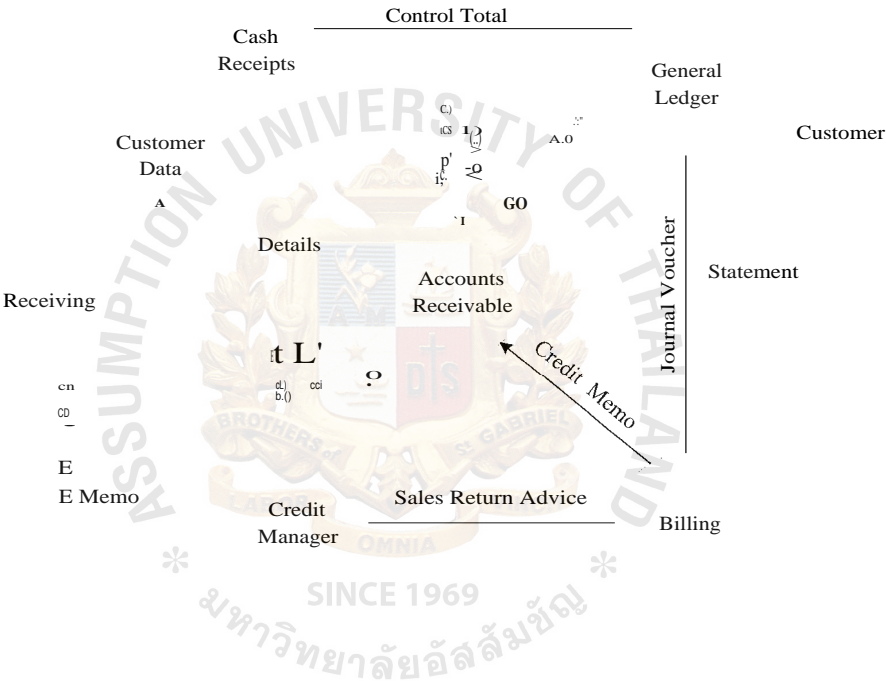


Figure 2.2. Data Flow Diagram: Accounts Receivable System.

(5) Purchase Order System

Purchase order system relates to the issuance of purchase orders for the procurement of raw materials, merchandise inventory, supplies, fixed asset, or certain intangibles such as patents or computer program.

It is a part of transaction process in purchasing department. It relates to requests for purchases that originate outside the purchasing department

that has function to select a vendor and arrange for terms and delivery. A copy of each purchase order is distributed to its vendor. The vendor will route invoices to purchasing for review and approval prior to being sent to accounts payable. As invoices and goods are approved, they will be forwarded for payment to vendor. Figure 2.3 illustrates a data flow diagram of a purchase order and an accounts payable system.

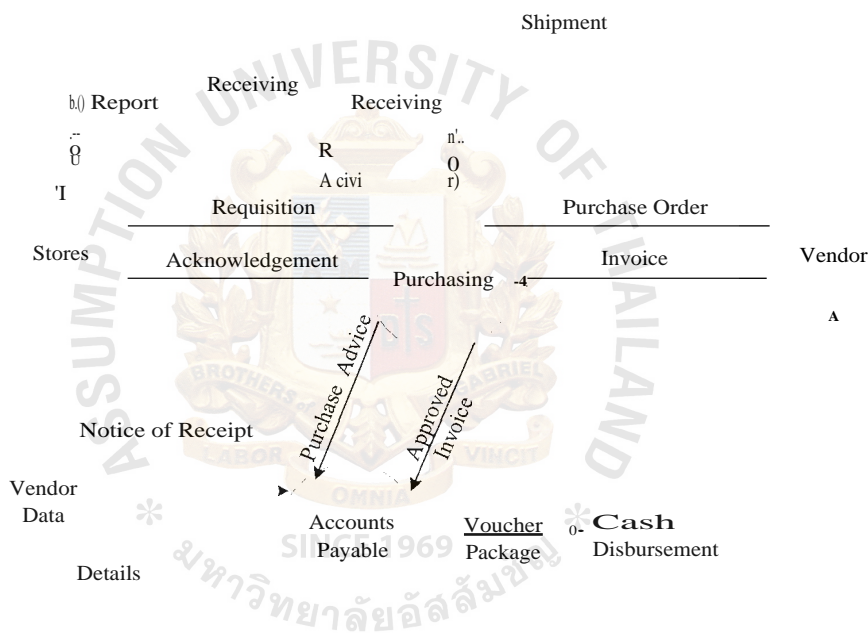


Figure 2.3. Data Flow Diagram: Purchase Order System.

(6) Accounts Payable System

Accounts payable system involves the processing of invoices received from vendors and the preparation of payment vouchers for the subsequent disbursement of cash for goods and services purchased. It includes the maintenance of records and the preparation of management reports dealing



with the accounts payable liabilities, the cash requirements necessary to meet them, and condition of cash and merchandise discount.

This process receives copies of the purchase order, report, and vendor invoices. These documents are reviewed, certified of completeness, and assembled in a voucher package that is filed by date. Periodically, the voucher package file is reviewed and voucher packages that are due are pulled out for payment. Accounts payable performs payment processing — calculating the amount due, discount, and other such items. The control total and journal voucher are reconciled and filed by date, and the totals are posted to the general ledger.

(7) General Ledger System

General Ledger involves the maintenance of journals and ledgers for recording and classifying the traditional financial transactions. It usually extends for entering the revenue and expense for the preparation of the trial balance, the formal financial statements, and profit & loss statement.

It relates to compare and reconcile the control totals, and post to the general ledger directly from each individual. Users can estimate the budget and compare them with the actual financial statement.

(8) Payroll System

Payroll system is responsible for the actual computation and preparation of payroll. The system provides a means of promptly and accurately paying employees such as wages, salaries, overtimes, and sometimes sales commissions and generates the necessary payroll reports. This process includes the activities of deduction for withholding taxes,

specialized deductions and government reporting. It includes the current and other expenditure both inside and outside of this company also.

Preparing payroll is independent of the preparation of input data on which pay is based, the time reports are received from personnel department. The payroll register details the computation of net pay (gross pay less deductions from pay). A copy of the payroll register is sent to accounts payable to initiate the recording of a voucher for the payroll. Some cheque that is sent to the payees will be canceled and forwarded to the bank. The canceled cheques that are received from the bank will be verified with bank statement by internal audit. Figure 2.4 illustrates a data flow diagram of a payroll system.

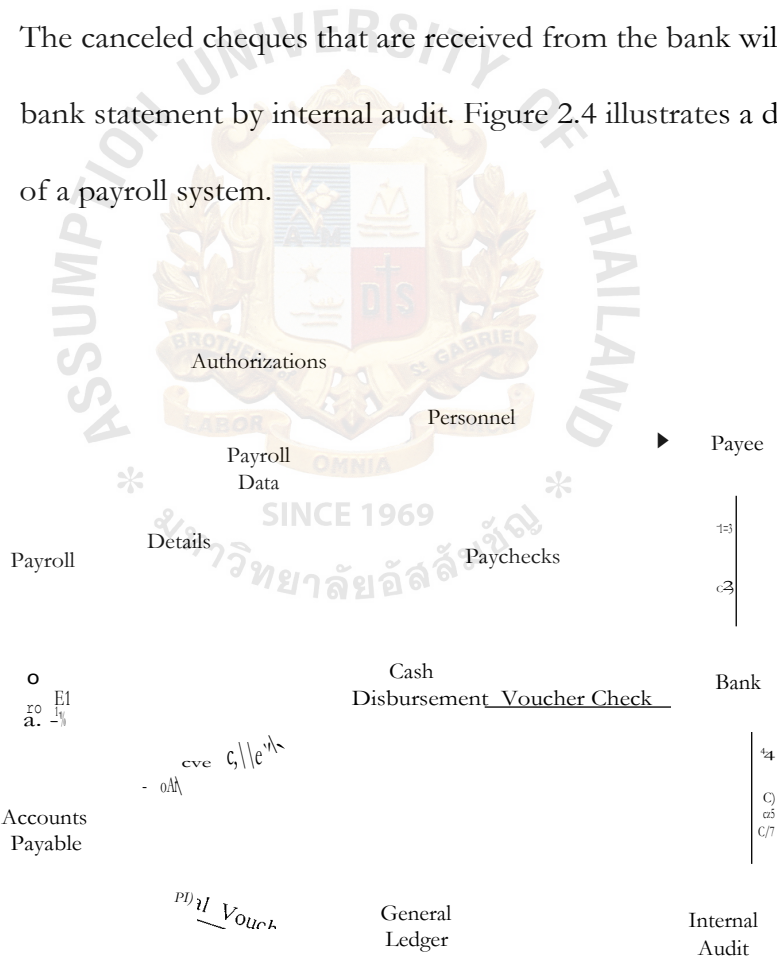


Figure 2.4. Data Flow Diagram: Payroll System.

## (9) Bank & Cheque Management System

Bank & cheque management system is a part of the systematic financial control. It is comprised the processes of deposit, withdrawal, and transfer cash and cheque. It includes monitoring the balance and the current amount in each bank statement to control the financial statement in each period.

For the part of cash receipt, the bank accepts the deposit and return deposit slip to account receivable system, then validates a copy of the deposit slip, and forwards to internal audit. For the part of cash disbursement, the bank receives the canceled cheques sent from cash disbursement from payees, then monitors them, and forwards them to internal audit. Internal auditor receives the periodic bank statement, validates a copy of the deposit slip, and the canceled cheque from the bank to reconcile the bank account. Its data flow diagram will be show in Figure

2.5.

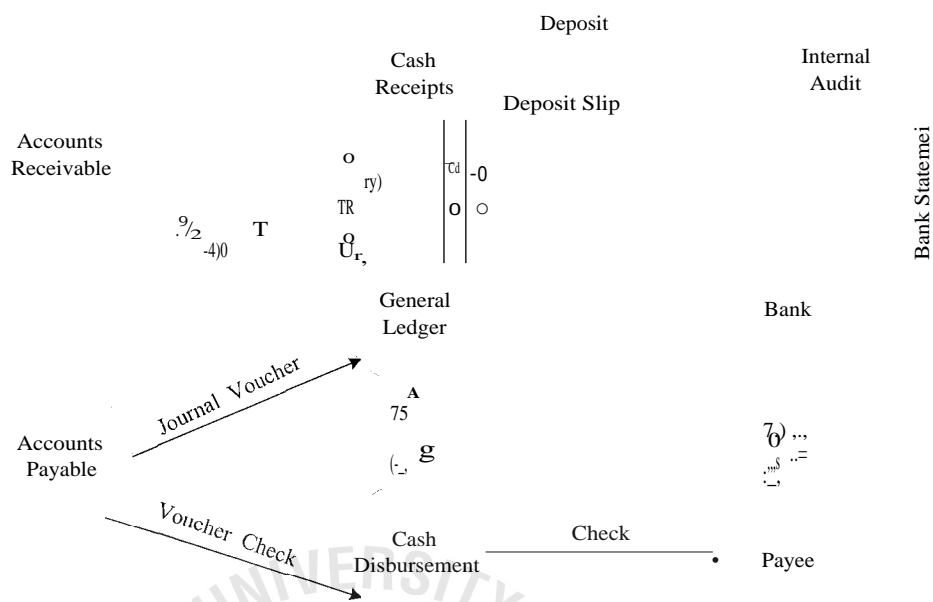


Figure 2.5. Data Flow Diagram: Bank & Cheque Management System.

Above all, Sodexho must consider improving the efficiency of operation in a part of production system also. Due to the fact that this company has to produce the medicine products into the market place so that the production information system to management are necessary for the operation in this area. However, The existing production information system for the production department are still managed by the manual system.

### 2.1.2 Production Information System

Production information system is comprised of the system of production control, quality control, and inventory control. The main feature in each of the production information system has been separated into the following functions related to the others in the same production information system:



## (1) Production Control System

Production control system involves the process of conversion of raw materials into finished goods, and the management of inventories. The processes have production activities and inventories of raw materials, work in process, and finished goods. The production cycle embraces the applications of production control, cost accounting, and inventory management. The last subsystem should be treated as two separate applications: the one that deals with the management of raw materials and the other which deals with finished goods.

The steps to be taken in the conversion of raw materials into finished goods are usually laid down in the form of work orders. Production planning process uses work orders to identify the tasks to be performed, the labor grades to which they should be assigned, and often the standard allotment of labor-hours to each task. Moreover, the costs of materials, labor, and factory overhead which reflects the costs of operating the production facility are input to production.

The production order serves as authorization for the production departments to produce certain products. Materials requisitions are issued for each production order to authorize the inventory control officers to release raw materials for inspection in the quality control system and sent to the production departments. As production orders are completed, then finished goods are transferred to the quality control system for approval and forwarded to the finished goods inventory that is subsystem in the inventory control system. Materials costs, labor, and factory overhead and finished

goods costs are posted to WIP(Work In Process) cost record. WIP records are communicated to operate in the management system of accounting department. Cost accounting function will receive copy of production order and material requisition to record in WIP record.

(2) Inventory Control System

Inventory control system aims at monitoring stock levels for consistent supply while avoiding the extremes of stock-outs, or excessive inventory levels. Inventories are replenished by the receipt of purchased raw materials or by completion of finished goods; they are depleted by issuance of materials to production or by the delivery of products to customers. These transactions must be processed so as to update the perpetual inventory records of the company. The inventory warehouse is divided into raw materials and finished goods warehouse. The raw materials warehouse receives invoices from supplier, then verifies the quantities that show on them with those of raw materials and issues the materials receipts. The raw materials are recorded to inventory stock monthly and use the FIFO policy to confirm the receiving and releasing. The finished goods warehouse compares invoices that are received from factory as finished goods, issues receipt, and then updates them to inventory stock. In case of releasing finished goods, the process picks a delivery order from the selling department and then updates inventory stock to reflect the actual quantities.

(3) Quality Control System

Quality control system has the purpose to inspect the quality of raw materials and finished goods from manufacturing process. The inspection

activities may include sampling, measuring, weighing, or testing the product to determine whether it conform to specifications. Any units or batches of products that are rejected by inspection are returned for rework or set as scrapped. Appropriate records must be kept of the inspection procedure and their outcome and spoilage are reported to the management. Figure 2.6 is a data flow diagram of a production control system.

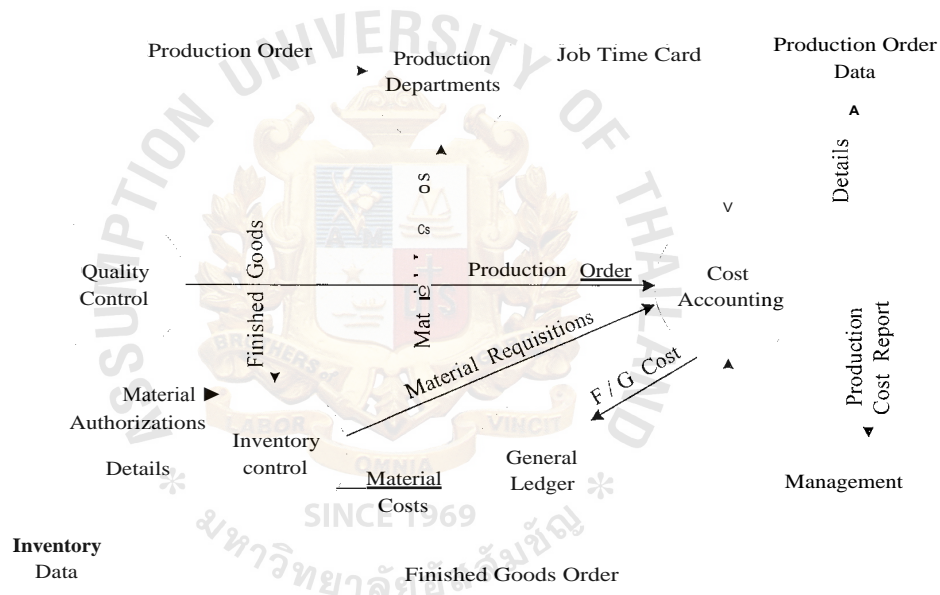


Figure 2.6. Data Flow Diagram: Production Control System.

Figure 2.7 in the next page illustrated the context diagram of the existing information system. It describes a whole system within the operation system of Sodexho Co., Ltd.

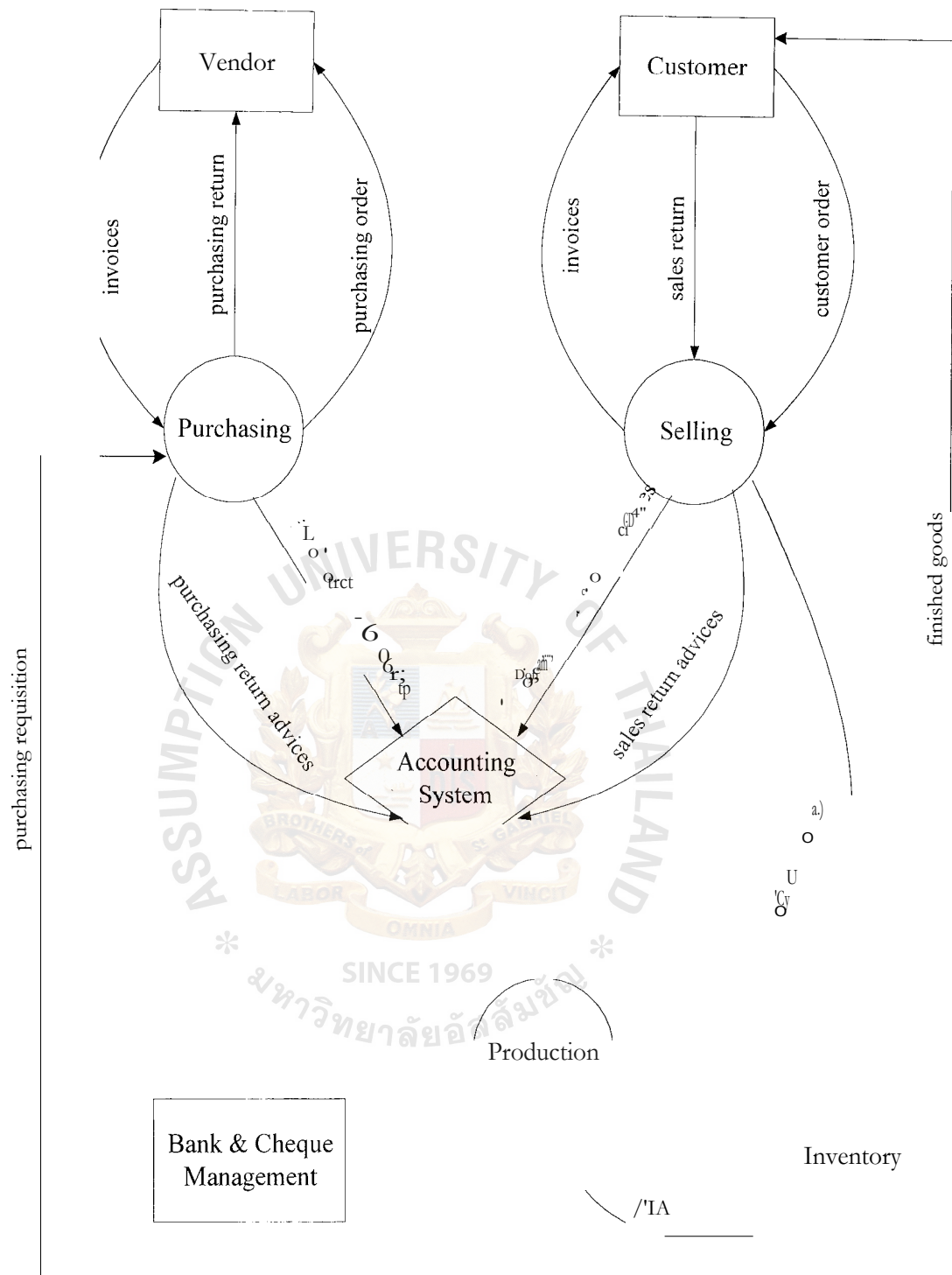


Figure 2.7. Context Diagram: The Existing Information System.

Figure 2.8 illustrates the data flow diagram of the existing information system. It concludes the flow of documents of a whole system within the operation system of Sodexho Co., Ltd.

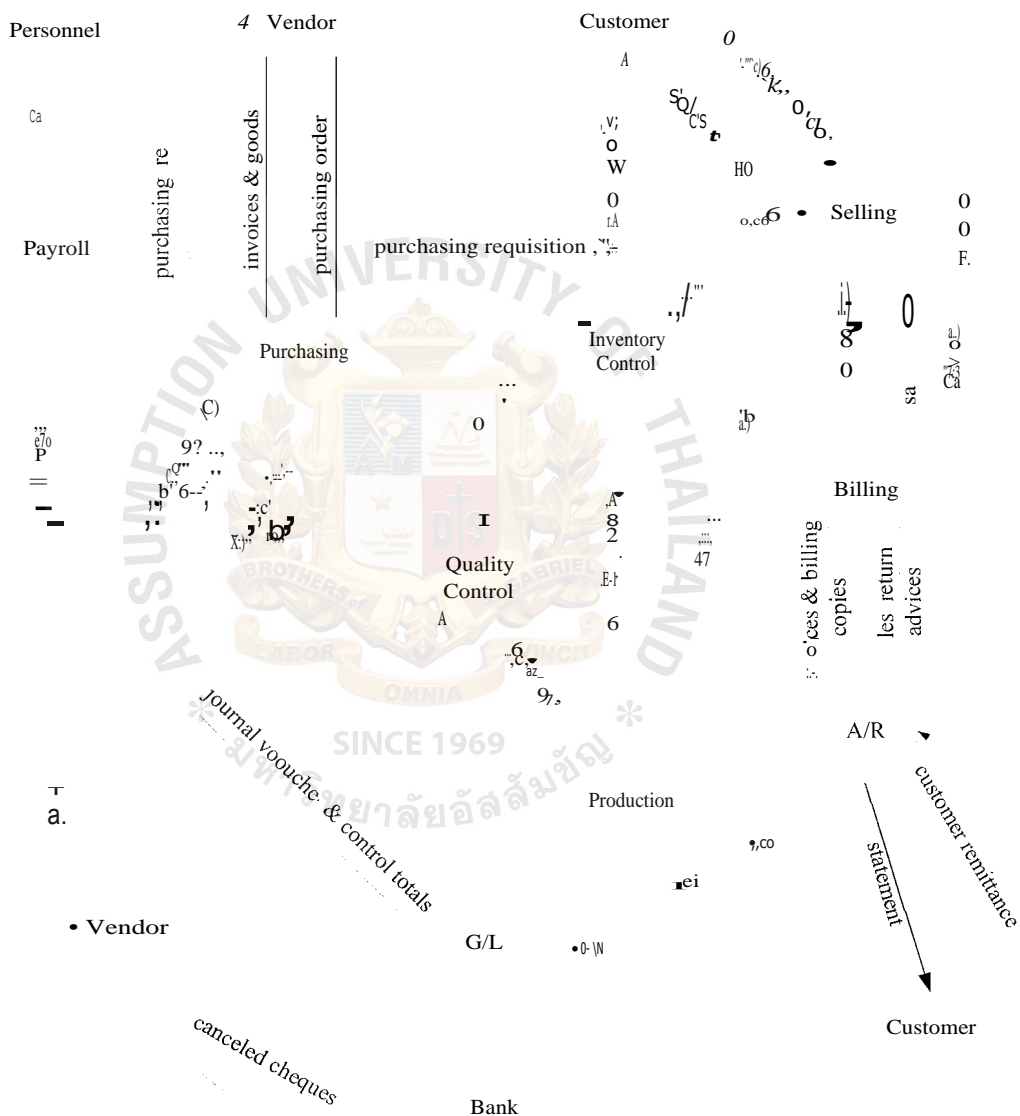


Figure 2.8. Data Flow Diagram: The Existing Information System.

## 2.2 The Existing Computer Based Information System (CBIS)

The CBIS of this company use 'Business Plus' software to operate the management information system. Due to the recurrence and tardiness of working system, staffs have to work overtime to report the documents to manager. The amount of excessive work had made the company encounter the financial problem. Initially, the company bring the PCs to setup as stand alone PCs working separately. The local area network has just been introduced lately for the workgroup environment.

To increase the efficiency of the manual operation, the software system had been set up on the PCs LAN with the star-network architecture to link the operation of Selling department and Financial and Administration department.

At the moment, the implementation of the computer system is not for every system. The officers in some systems are still recording the operations manually as the bookkeeping. As a result of this, the records become redundant, the data records are untimely, and quality of information for managers is poor.

Furthermore, the workgroup system has been linked to raise the efficiency of operating in the part of the office. To reduce time of work and to increase speed of performance, the company is determined to set connection of the whole system to work in a full network system

Figure 2.9 illustrates the flowchart of the existing network system. It describes the system of the existing network and communication of application software from one point to the others. This existing network system is only connected to some part within the accounting system.



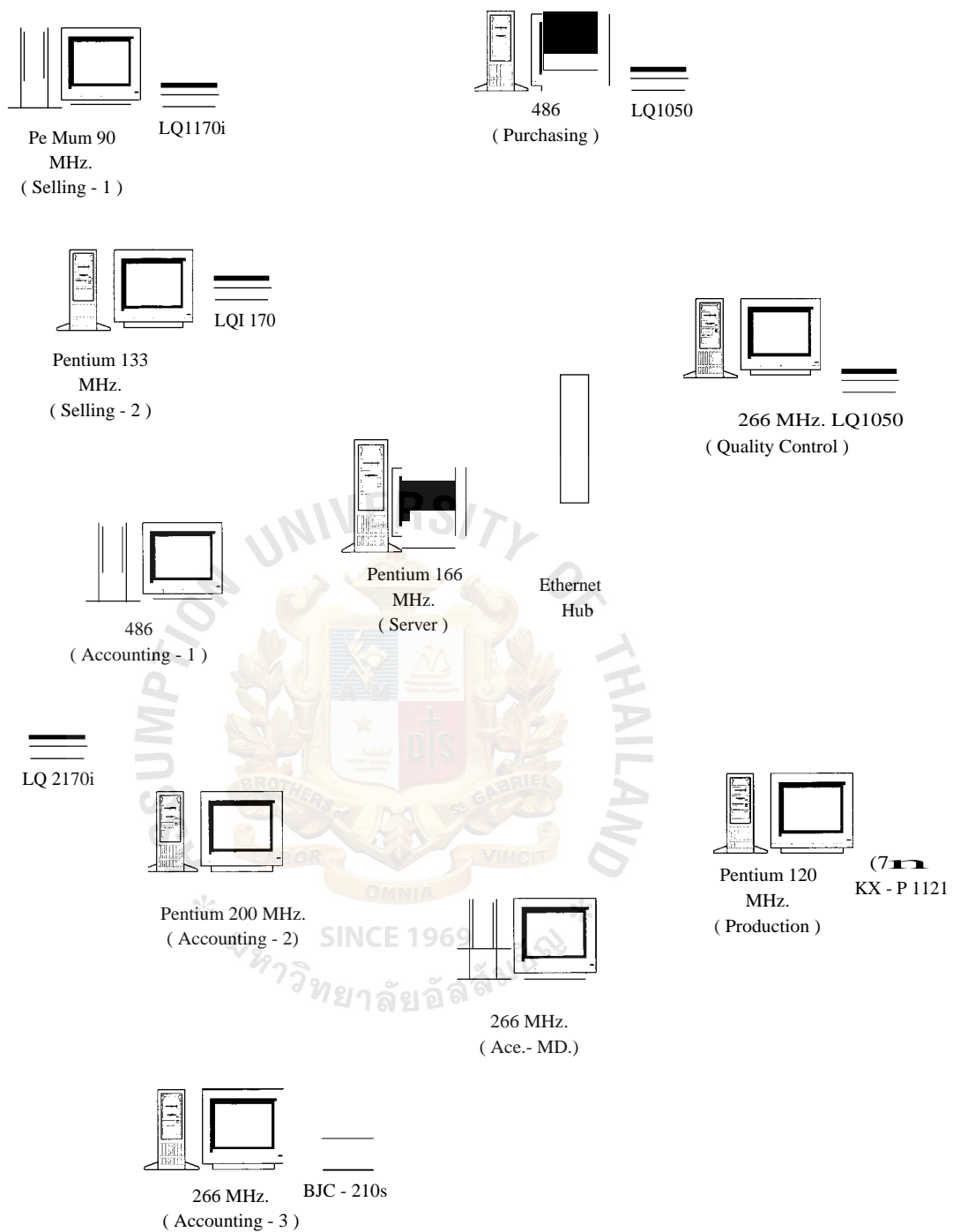


Figure 2.9. Network Diagram: The Existing Network System.

Table 2.1. The Current Hardware and Software Configuration (Part I).

Details	Server	Workstation	
		( Accounting Manager & Accounting-3)	(Accounting-1)
Processor	Pentium-166 MHz with SD RAM 32 Mb	AMD K6-2 266 MHz M/B Bus, with Cache 512 Kb, RAM 33 Mb	486 DX4-100 M/B 486 with RAM 8 Mb
Disk Subsystem	Hard Disk 3.2 Gb• FDD 1.44 Mb,CD ROM drive	Hard disk 2.1 Gb; FDD 1.44 Mb,CD ROM drive	Hard Disk 850 Mb, FDD 1.44 Mb
Tape Subsystem	3,200 Mb Backup, 3.2 Gb Cartridge		
Other	FV Color Monitor 14", UPS 1,200 VA.	SVGA Color Monitor 14",	Color Monitor 14", UPS 700 VA.
System	DOS	DOS	DOS
Application Software	Business Plus V.4.18 ( Order Entry, A/R, A/P, G/L, Sales Management, Sales Analysis, Bank & Cheque Management )	Microsoft Window, Microsoft Office, dBASE 5.0	Microsoft Window, Microsoft Office, dBASE 5.0
Operating System	Window 95		
Network	Topology - Ethernet		
Communi- -cation	Ethernet Hub (AUI & BNC) 16 Ports, LANBIT Ethernet (LAN Card), UTP CAT 5 Cables, Connectors		

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Table 2.2. The Current Hardware and Software Configuration (Part II).

Details	Workstation		
	(Accounting-2)	( Selling-1)	( Selling-2 )
Processor	Pentium-200 MHz Corn Laser with Cache 512	Pentium-90 MHz with RAM 16 Mb	Pentium-133 Com Laser with SIMM
Disk	Hard Disk 2.1 Gb IDE;	Hard Disk 3.24 Gb SCSI;	Hard Disk 1 Gb;
Subsystem	FDD 1.44 Mb,	FDD 1.44 Mb,	FDD 1.44 Mb,
Other	Laser Monitor 14", UPS 500 VA.	VGT 1481 GL Monitor 14", UPS 500 VA.	Laser Monitor 14", UPS 600 VA.
System Software	DOS	DOS	DOS
Application Software	Microsoft Window, Microsoft Office,	Microsoft Window, Microsoft Office,	Microsoft Window, Microsoft Office,

Table 2.3. The Current Hardware and Software Configuration (Part III).

Details	Workstation		
	( Purchasing)	( Production)	( Quality Control )
Processor	486 DX4-100 M/B 486 PCI Bus with RAM 8	Pentium-120 Interface with RAM 16 Mb	AMD K6-2 266 MHz M/B Bus, with
Disk	Hard Disk 850 Mb, FDD	Hard Disk 1.2 GB; FDD	Hard disk 2.1 GB;
Subsystem	1.44 Mb	1.44 Mb, CD ROM drive	FDD 1.44 Mb, CD
Other	Monochrome Monitor 14", UPS 250 VA.	Color Monitor 14"	SVGA Color Monitor 14", UPS
System Software	DOS	DOS	DOS
Application Software	Microsoft Window, Microsoft Office,	Microsoft Window, Microsoft Office,	Microsoft Window, Microsoft Office,

## 2.3 Current Problems of the Organization

After the survey and study of this organization has been made, it is found that Sodexho has faced the loss for the past five years. Most of the problems stem from an poor education of some staff and no vision of executive manager about new knowledge or technologies. To show the problems of the organization, we consider them in two parts; management system and computer & software system. Analysis of the existing system of accounting and other control systems shows that the problems can be broken down as follows:

### 2.3.1 Management System

- (1) Personnel education levels, experiences and individual skills are significant parts of a good management system. The more of these personnel attribution can bring more progressive to the company. Many personnel in this company are poorly trained for their jobs and lack clear responsibilities, which results in documentation errors, tardiness in job completion and complex management system that affects the growth of the organization.
- (2) Executive managers do not know much of accounting and cannot use accounting on the computer systems efficiently, so they are uncertain about how to solve problems in their management. Their indecisiveness has led to lack of control and poor training of subordinates in efficient operations, making the entire system fail to reach the management goals.
- (3) Personnel who use computers are not well trained in computer operations and related software. They cannot use the system effectively. They have not been properly trained to use the computer system in solving any of the

company's problems. As a result, the CBIS for this company has not been developed properly.

- (4) The financial statement does not comply with budget and cash flow information required for a good management system. Asset, depreciation and accumulated depreciation of the assets are not recorded. Actual costs do not appear to be used to analyze where costs are exceeding the budget.
- (5) Part of the management system has redundant operations, such as inventory stock and purchasing subsystems in which management officers must enter and classify data manually to progress reports that may be incorrect or not current.

#### 2.3.2 Computer and Software System

- (1) The software system is still being used in a stand-alone manner even though it is set up for network usage. It cannot be operated with the concurrent system. Here the billing process cannot be issued at the same time in each period. This deficient software not only slows down the overall system but requires excessive overtime work which wears down company personnel.
- (2) The capacity and speed of the server is lower than that of some clients. This results in inefficiency and could cause major problems when production system expands beyond the capability of the current system.
- (3) There are no linkage network and set up of the software system to the inventory system, production processes, and purchasing subsystems. The existing manual entering of purchasing, inventory control, and production processes are slow and inaccurate, leading to confusion between sections and unnecessary use of extra personnel.

- (4) The capability of existing software system does not support the production system that is a necessity in expanding and developing products.

## **2.4 Solving the Organization's Current Problem**

Because Sodexho is encountered with many problems that slow operating system of organization down, the requirements in solving them must be considered as a high priority. To improve a more efficient operating system, the company needs to identify each problem directly. It has also to be the most efficient and correct approach. The illustration of this approach will be described in this following:

### **2.4.1 Management System**

- (1) To improve the knowledge, skill, and capability of personnel, the manager should invest more for their staffs by:
- (a) Personally teaching and coaching them on the job.
  - (b) Providing them with opportunities to gain different types of management experiences at situations and styles.
  - (c) Encouraging them to enroll in formal training and education by providing a company tuition refund plan.
  - (d) Rationalizing the process of work in the organization and reviewing job descriptions and job specifications to relevant jobs and positions in organization.
- (2) Scheduling the training courses for managers in accounting and accounting on the computer system. This will help managers to understand international management standards.



- (3) Rotating personnel through all departments so they will be familiar with each position. This will help determine which person is right for each job as well as widen everyone's experience.
- (4) Correcting all erroneous work procedures so that these actions will not be repeated.
- (5) Scheduling periodic meetings in each department to review work procedures and goals.
- (6) Encouraging personnel to work as a team to improve the company and enjoy more benefits as the company becomes more efficient and profitable. This will result in reduced cheating and lack of trust as well as lower turnover among employees.
- (7) Developing standardized budget and cash flow systems so as for the management to have real financial control of the company.

#### 2.4.2 Computer and Software System

- (1) This company must either bring in a new and more efficient software system compatible to its existing system, or at least modify some of its existing system with additional new programs in appropriate areas. Furthermore, this company encounters with billing problem. They are in need of Network Operating System(NOS) like Windows NT or Novell. Workgroup system for more efficient and software system The NOS will help users to retrieve data under the same command at the same time.
- (2) The company needs to develop training programs for managers and personnel in the use of computers and software systems before they start using them. Periodic training should also be scheduled to maintain and

improve everyone's skills, particularly as new programs are added or updated.

- (3) The capacity and speed of the current operating system should be reviewed and changed where the systems are not compatible with the job required. The database server should be upgraded and some client's positions should be transferred or upgraded.
- (4) Network and software system should be linked and setup into overall sections. Network system will help sending and receive information between sections more easily and quickly so that many clients can retrieve correct data more rapidly from the same software system.
- (5) Select a new application software package that covers both the accounting and production system.

Because the current software package can not sufficiently propose an efficient operation system, so the documentary will be tardy, complicated, and error. Additionally, the company has the policy to expand the production system in the future. As a result, needed software package should be the one that can be used with the software for the production system to be implemented in the future.

Hence, we must question the user requirements and analyze the quantitative and qualitative costs-benefits in consideration to select a new software package from each candidate. Both of them will be described more in the next chapter.

### III. THE ALTERNATIVE CONSIDERATIONS

#### 3.1 The Information Requirements

Perhaps the most difficult task of the systems analyst is to define the specific information requirements that must be met by the system solution selected. This is the area where many large system efforts go wrong and the one that poses the greatest difficulty for the analyst. At the most basic level, the information requirements of a new system involve identifying who needs what information, where, when, and how. Requirements analysis carefully defines the objectives of the new or modified system and develops a detailed description of the functions that the new system must perform. Requirements must consider economic, technical, and time constraints, as well as the goals, procedures, and decision processes of the organization. Faulty requirements analysis is a leading cause of systems failure and high systems development costs. A system designed around the wrong set of requirements either will have to be discarded because of poor performance or will need to be heavily revised. Therefore, the importance of requirements analysis must not be underestimated. Developing requirements specifications may involve considerable research and revision. A business function may be very complex or poorly defined. A manual system or routine set of inputs and outputs may not exist. Procedures may vary from individual to individual. Such situations will be more difficult to analyze, especially if the users are unsure of what they want or need.

In many instances, business procedures are unclear or users disagree about how things are done and should be done. System analysis often makes an unintended contribution to the organizational consensus about how things should be done. In many instances, building a new system creates an opportunity to redefine how the

organization conducts its daily business. Some problems do not require an information system solution, but instead need an adjustment in management, additional training, or refinement of existing organizational procedures. If the problem is information related, systems analysis may still be required to diagnose the problem and arrive at the proper solution. To derive information system requirements, the analyst may view them through the three major activities of the requirements anticipation, requirements investigation, and requirements specification.

### 3.1.1 The Requirements Anticipation

Having had experience in a particular business area or having encountered systems in an environment similar to the one currently under investigation will influence systems analysts' study. They may foresee the likelihood of certain problems or features and requirements for a new system. As a result, the features they investigate for the current system, questions they raise, or methods employed may be based on this familiarity.

Requirement anticipation can be a mixed blessing. On the one hand, experience from previous studies can lead to investigation of areas that would otherwise go unnoticed by an inexperienced analyst. Having the background to know what to ask or which aspects to investigate can be a substantial benefit to the organization.

On the other hand, if a bias is introduced or shortcuts are taken in conducting the investigation, requirement anticipation is a problem. We will point out guidelines for structuring an investigation around basic questions to avoid the undesirable consequences of requirement anticipation.

To achieve feasibility study, system analysis process, we decided to anticipate the requirements before questioning the user requirements. This method can pull the user requirements more easily and rapidly. It will be described in following details:

- (1) Planning to change the existing CBIS to LAN system and select the system software that has capability to run Window on the operating system.
- (2) Expansion on using the CBIS throughout the company.
- (3) Developing a new application software package that has capability to support the accounting and production system in the same one.
- (4) Selecting CBIS, which complies with Y2K and support the computing security in a new application software package.

### 3.1.2 The Requirements Investigation

This activity is at the heart of systems analysis. Using a variety of tools and skills, analysts study the current system and document its features for further analysis.

Requirements investigation relies on study and documentation of the current system, using fact-finding techniques, dataflow analysis, and decision analysis. The requirement investigation raised from analyst's force to work or rework requirement statements in cooperation with users.

By depending on the mentioned requirement anticipation and the interview with the managing director, the accounting and production manager, and some staff in Sodexho, we could conclude their requirements to consider that new software package are followed these particulars:

- (1) Prompt submission of the correct statement of accounts.
- (2) Improvement the defects of production process that arises from fault of staffs or worker within production departments.

- (3) Summary sales amount and commissions of salesperson by separation product sales by territory, product sales by salesperson and product sales by type or kind of goods. And net sales amount should be reported after deducted welfare benefits.
- (4) Specification of the returned product report in form which should include; sales amount, returned amount, details of returned product, net sales amount, and net value.
- (5) Modification of the existing network system so then it will be more efficient and compatible with future production plans.
- (6) Installation of security system into the operating system, including protection from possible destruction or malfunction due to Y2K problem.
- (7) Protection from cheating or repetition of billing by locking its system to print documentation in only one time.

### 3.1.3 The Requirements Specifications

The data produced during the fact-finding investigation are analyzed to determine requirement specifications, and the description of features for a new system.

Analysis of data describing the system to determine how well it is performing, what requirements must be met, and strategies for fulfilling them.

As gathered both mentioned requirements, we will gather them in the requirement specifications that is the genuine requirements in inclusive consideration to select a needed software package. The features that must be included in routing to select a new application software package are specified as followed:

- (1) Reengineering the organization structure to be top-down and vision-driven.
- (2) Planning to recruit the professional manager to control in each department.



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- (3) Creating the distinct function to subordinates in each position or responsibility.
- (4) Promptly submit the correct statement of accounts.
- (5) Improving the defect of production process that arises from fault of staffs or worker within production departments.
- (6) Bringing PCs to use in the inventory control system for decreasing the redundant bookkeeping by the manual method.
- (7) Expanding the use of the CBIS throughout the company.
- (8) Changing the system software that has capability to run Window on the operating system.
- (9) Developing a new application software package that has capability to support the accounting and production system in the same one.
- (10) Compliance with Y2K and support the computing security in a new application software package as the users and manager need.
- (11) Forming of each financial statement report as flexible as the users and manager required.

### 3.2 Information System Software

The usefulness of computer hardware depends a great deal on available software and the ability of management to evaluate, monitor, and control the utilization of software in the organization. It also depends on how software turns computer hardware into useful information systems. It describes the major types of software and provides criteria for selecting software.

### 3.2.1 Major Types of Software

Software is the detailed instruction that controls the operation of a computer system. Without the software, computer hardware could not perform the tasks we associate with computers. The functions of software are to

- (1) manage the computer resources of the organization.;
- (2) provide tools for human beings to take advantage of these resources;
- (3) act as an intermediary between organizations and stored information.

Selecting appropriate software for the organization is then a key management decision. There are two major types of software: system software and application software. Each kind performs a different function.

- (a) System software is a set of generalized programs that manage the resources of the computer. It coordinates the various parts of the computer system and mediates between application software and computer hardware. The system software that manages and controls the activities of the computer is called the operating system.
- (b) Application software describes the programs that are written for or by users to apply the computer to a specific task. An application software package is a set of prewriting, 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 microcomputer) to over 400 program modules with 500,000 lines of code for a complex mainframe system. When an appropriate software package is available, it eliminates the need for writing software programs

when an information system is developed and reduces the amount of design, testing, installation, and maintenance work as well.

### 3.2.2 General Criteria for Selecting Software

#### (1) System software

If a firm wants an operating system for its mainstream business applications, it needs an operating system that is compatible with the software required by these applications. The operating system should be easy to use and install. The user interface features of the operating system should be easy to learn. Mission-critical applications have special operating system requirements, because businesses depend on them for their continuing operation and survival. For such applications an operating system that provides reliable support for multitasking and memory management is essential. The operating system should be able to run multiple applications quickly without having the system crash because applications are contending for the same memory space. Mission-critical applications typically have large volumes of transactions to process and require operating systems that can handle large complex software programs and massive files.

#### 2) Application software

Packages have flourished because organizations have many common information requirements for functions such as payroll, accounts receivable, general ledger, or inventory control. For such universal functions with standard accounting practices, a generalized system will fulfill the requirements of many organizations. Therefore, it is not necessary for a

company to write its own programs; the prewriting, predesigned, pretested software package can fulfill the requirements and can be substituted instead. Because the package vendor has already done most of the design, programming, and testing, the time frame and costs for developing a new system should be considerably reduced.

The criteria to choose the software packages that are the most compatible with the organization.

- (a) Application software packages have been widely used for developing systems.
- (b) Application software packages involve the most cost-effective development strategy.
- (c) Application software packages have to cover with accounting system and portable to production system also.
- (d) Application software packages must be compatible with the company and the selected software.
- (e) Application software packages should describe to the details of configuration of each candidate.
- (f) The application software selected should be the one that its extended feature can be applicable for future use of the company.

### 3.3 The Advantages of Software Packages

Application software packages can facilitate system design, testing, installation, maintenance support, and organizational acceptance of a new system.

Design activities may easily consume up to 50 percent or more of the development effort. Because design specifications, file structure, processing

relationships, transactions, and the package vendor has already worked out reports, most of the design work has been accomplished in advance. Software package programs are usually pretested before they are marketed to eliminate major technical problems. Testing the installed package can be accomplished in a relative shorter period. Many vendors supply sample test data and assist with the testing effort. Vendors also supply tools and assistance in installing major or minicomputer systems and provide much of the ongoing maintenance and support for the system. For system such as human resources or payroll, the vendor is responsible for making changes to keep the system in compliance with changing government regulations. The vendor supplies periodic enhancements or updates; these are relatively easy for the client's in-house staff to apply.

Fewer internal information system resources are necessary to support a package-based system. Because 50 to 80 percent of information systems budgets can be consumed by maintenance costs, the package solution is one way to cut these costs and free internal staff for other applications. The package vendor maintains a permanent support staff with expert knowledge of the specific application package. If a client's information systems personnel terminate or change jobs, the vendor remains a permanent source of expertise and help. System and user documentation is prewriting and kept current by the vendor.

An added benefit of packages is the way they can reduce some of the organizational bottlenecks in the systems development process. The need to work and rework design specifications is reduced because the package specifications are already fixed; users must accept them as is. External design work is often perceived as being superior to an in-house effort. The package offers a fresh start by a third party who is in

a stronger position to take advantage of other companies' experiences and state-of-the-art technology. Management can be more easily convinced to support a new information system based on packaged software because major software costs appear to be fixed. Problems with the system can be attributed to the limitations of the package rather than to internal sources. Thus, the major contribution of packages may be their capacity to end major sources of organizational resistance to the systems development effort.

### **3.4 Selecting Software Packages**

In surveying packages software, analyst should conduct a feasibility study to determine whether that solution is feasible, or achievable, given the organization's resources and constraints. Three major areas of feasibility must be addressed.

- (1) Technical feasibility: whether the proposed solution can be implemented with the available hardware, software, and technical resources.
- (2) Economic feasibility: whether the benefits of the proposed solution outweigh the costs.
- (3) Operational feasibility: whether the proposed solution is desirable within the existing managerial and organizational framework.

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, software resources, database requirements, installation and maintenance effort, documentation, vendor quality, and cost.



The package evaluation process is often based on a Request for Proposal (RFP), which is a detailed list of questions submitted to vendors of packaged software. The RFP is likely to include questions such as the following:

#### Package Evaluation Criteria

##### (1) Function

The functions included vary by application. But for the specific application, the following considerations are important:

- (a) How many of the functional requirements will the package meet?
- (b) Which functions only modifying the package code can support?
- (c) How extensive is the modification required?
- (d) Which functions cannot be supported at all by the package?
- (e) How well will the package support future and current needs?

##### (2) Flexibility

- (a) How easy is the package to modify?
- (b) What customization features are included?
- (c) Is the vendor willing to modify the software for the client?

##### (3) User Friendliness

- (a) How easy is the package to use from a nontechnical standpoint?
- (b) How much training is required to understand the package system?
- (c) How much user control does the package allow?

##### (4) Hardware and Software Resources

- (a) On what model computer can the package run?
- (b) What operating system is required?
- (c) How many CPU and storage resources does the package utilize?

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(d) How much computer time is needed to run the package?

## (5) Database/File Characteristics

- (a) What kind of database/file structure does the package use?
- (b) Do the standard fields in the package file correspond to the data elements specified by the application requirements?
- (c) Does the database or file design support the client's processing and retrieval requirements?
- (d) Are there provisions to add customized user fields for data elements that are not standard with the package?

## (6) Installation Effort

- (a) How much change in procedures would the package necessitate?
- (b) How difficult would it be to convert from the current system to the package system?

## (7) Maintenance

- (a) Does the vendor supply updates or enhancements to the system?
- (b) How easy are these changes to apply?
- (c) What is the minimum internal staff necessary for ongoing maintenance and support (applications programmers, analyst, database specialists)?
- (d) Is the source code clear, structured, and easy to maintain?

## (8) Documentation

- (a) What kind of documentation (system and user) is provided with the package?
- (b) Is it easy to understand and use?

- (c) Is the documentation complete, or must the client write additional instruction to use the package?

#### (9) Vendor Quality

- (a) Is the vendor experienced in this application area?
- (b) Does the vendor have a strong sales and financial record?
- (c) Will the vendor continue to remain in business and support the package?
- (d) What kind of support facilities does the vendor provide for installation and maintenance (support staff, hot lines service, training facilities, research and development staff)?
- (e) Is the vendor responsive to clients' suggestions for improvements?
- (f) Does the vendor have an active user group that meets regularly to exchange information on experiences with the package?

#### (10) Cost

- (a) What is the purchase or lease price of the basic software?
- (b) What does the purchase price include (add-on modules; on-line, retrieval, or screen generator facilities; consulting time, training, installation support)?
- (c) Is there a yearly maintenance fee and contract?
- (d) What are the annual operating costs for the estimated volume of processing expected from the package?
- (e) How much would it cost to tailor the package to the user's requirements and install it?

### 3.5 The Plans for Implementing Information Systems

Deciding what new systems to build should be an essential component of the organizational planning process. Organizations need to develop an information systems plan that supports their overall business plan. As specific projects have been selected within the overall of a strategic plan for the business and system area, the information system plan can be developed.

The plan contains a statement of corporate goals and specifies how information technology supports the attainment of those goals. The report shows how general goals will be achieved by specific systems projects. It lays out specific target dates and milestones that can be used later to judge the progress of the plan in terms of how many objectives were actually attained in the time frame specified in the plan.

The company should prepare the master plan to control the management system and to organize all activities that will plan to performance in organization.

### 3.6 Hardware and Software Requirement

Analyzing the information system not only is concerned with the requirements anticipation and requirements investigation but also refers to the software packages requirements. In case of survey software packages, we can keep three of them to propose as alternative in the comparative analysis. This item will be detailed in the form of the following hardware and software minimum requirements.

#### Hardware and Software Minimum Requirements

#### Alternatives I: Business plus Software Package

#### Hardware Requirements

- (1) PC 386 XT up to LAN.
- (2) Hard Disk 20 Mb. or greater.

(3) Dot Matrix Printer.

Software Requirements

- (1) Microsoft Windows NT. or Novell Net ware.
- (2) Microsoft Windows 95
- (3) DOS

Alternatives II: AccPac Software Package

Hardware Requirements

- (1) File Server - Pentium 166 MHz with 64 Mb. of memory.
- (2) Workstation - Pentium 133 MHz with 32 Mb. of memory.
- (3) Column Printer (A Laser Printer is recommended).
- (4) CD-ROM Drive required for installation.

Software Requirements

- (1) ACCPAC for Windows System Manager Version 3.0 (or higher).
- (2) Microsoft Windows 95 or Windows NT 3.51 workstation (or higher).
- (3) Microsoft Advanced Server Version 3.51 (or higher) and Btrieve for Windows NT Version 6.15 (or higher).

Alternatives III: Platinum Software Package

Hardware Requirements

- (1) File Server - Pentium Processor with RAM 40 Mb.
- (2) 300 Mb. or greater hard disk, 32 bit NIC, Color Monitor.
- (3) Workstation - Pentium Processor with RAM 20 Mb.
- (4) 20 Mb. free hard disk space.
- (5) 32 bit NIC, CD-ROM Drive, Color Monitor.

## Software Requirements

- (1) Microsoft Windows NT Server 3.51, or Novell Netware 3.12 or 4.1.
- (2) Microsoft Windows NT 3.51, or 4.0 workstation
- (3) Microsoft Windows 95





## IV. THE COMPARATIVE ANALYSIS

### 4.1 The Comparative Strategy

Information systems can have several different values for business firms. They can provide a temporary competitive advantage to firms. A consistently strong information technology infrastructure can, over the long term, play an important strategic role in the life of the firm. At least, information systems can permit firms simply to survive. In many cases, survival even at a mediocre level will dictate investment in systems. In addition, government regulations may require these survival investments.

Strategy can not be pursued when a firm is financially unsound. The worth of systems from a financial perspective essentially revolves around the question of return on invested capital. The value of systems from a financial view comes down to one question: Does a particular information system investment produce sufficient returns to justify its costs? There are many problems with this approach, not the least of which is how to estimate benefits and count the costs.

### 4.2 Capital Budgeting Models

Capital Budgeting Models are one of several techniques used to measure the value of investing in long-term capital investment projects. The process of analyzing and selecting various proposals for capital expenditures is called "capital budgeting". Firms invest in capital projects to expand production to meet anticipated demand, or to modernize production equipment to reduce costs. Information systems are considered long-term capital investment projects. Five capital budgeting models are used to evaluate capital projects as follows:

#### 4.2.1 The Payback Method

The payback method is quite simple: It is a measure of time required to pay back the initial investment of a project. The payback period is computed as:

$$\frac{\text{Original investment}}{\text{Annual net cash inflow}} = \text{Numbers of years to pay back}$$

The payback method is a popular one because of its simplicity and power as an initial screening method. It is especially good for high-risk projects in which the useful life is difficult to know. If a project pays for itself in two years, then it matters less how long after two years the system lasts.

This method ignores the time value of money, the amount of cash flow after the payback period, the disposal value (usually zero with computer systems), and the profitability of the investment.

#### 4.2.2 Accounting Rate of Return on Investment (ROI)

Firms make capital investments to earn a satisfactory rate of return. Determining a satisfactory rate of return depends on the cost of borrowing money, but other factors can enter into the equation. Such factors include the historic rates of return expected by the firm. In the long run, the desired rate of return must equal or exceed the cost of capital in the marketplace. Otherwise, no one will lend the firm money.

The accounting rate of return on investment (ROI) calculates the rate of return from an investment by adjusting the cash inflows produced by the investment for depreciation. It gives an approximation of the accounting income earned by the projects. To find the ROI, first calculate the average net benefit and then divide this net benefit by the total initial investment to arrive at ROI as follows:

$$\frac{(\text{Total benefits}-\text{Total cost}-\text{Depreciation})}{\text{Useful life}} = \text{Net benefit}$$

$$\frac{\text{Net benefit}}{\text{Total initial investment}} = \text{ROI}$$

This method can ignore the time value of money. Future saving are simply not worth as much in today's dollars as are current savings. ROI can be modified so that future benefits and costs are calculated in today's dollars.

#### 4.2.3 Net Present Value

Evaluating a capital project requires that the cost of an investment (a cash outflow usually in year 0) be compared with the net cash inflows that occur many years later. But these two kinds of inflows are not directly comparable because of the time value of money. Money we have been promised to receive three, four, and five years from now is not worth as much as money received today. Money received in the future has to be discounted by some appropriate percentage rate-usually the prevailing interest rate, or sometimes the cost of capital. Present value is the value in current money of payment or stream of payments to be received in the future. It can be calculated by using the following formula:

$$\text{Payment} \times \frac{1 - (1 + \text{interest})^{-n}}{\text{Interest}} = \text{Present Value}$$

Thus, to compare the investment with future savings of earnings, we need to discount the earnings to their present value and then calculate the net present value of the investment. The net present value is the amount of money an investment is

worth taking into account its cost, earnings, and the time value of money. The formula for net present value is

$$\text{Present value of expected cash flows} - \text{Initial investment cost} = \text{Net present value}$$

#### 4.2.4 Cost-Benefit Ratio

A simple method for calculating the returns from a capital expenditure is to calculate the cost-benefit ratio, which is the ratio of benefits to costs. The formula is

$$\frac{\text{Total benefits}}{\text{Total costs}} = \text{Cost-benefit ratio}$$

The cost-benefit ratio can be used to rank several projects for comparison. Some firms establish a minimum cost-benefit ratio that must be attained by capital projects. The cost-benefit ratio can of course be calculated using present values to account for the time value of money.

#### 4.2.5 Internal Rate of Return (IRR)

Internal rate of return (IRR) is a variation of the net present value method. It takes into account the time value of money. It is defined as the rates of return or profit that an investment is expected to earn. IRR is the discount (interest) rate that will equate the present value of the project's future cash flows to the initial cost of the project. In the other words, the value of R (discount rate) is such that

$$\text{Present value} - \text{Initial cost} = 0$$

### 4.3 Cash Flows

All capital budgeting methods rely on measures of cash flows into and out of the firm. Capital projects generate cash flows into and out of the firm. The investment cost is an immediate cash outflow caused by the purchase of the capital equipment. In subsequent years, the investment may cause additional cash outflows that will be balanced by cash inflows resulting from the investment. Cash inflows take the form of increased sales of more products (for reason including new products, higher quality, or increasing market share), or reduction in costs of production and operation. The difference between cash outflows and cash inflows is used for calculating the financial worth of an investment. Once the cash flows have been established, several alternative methods are available for comparison among different projects and decision making about the investment.

### 4.4 Selection the Alternatives for Organization

Identifying the costs associated with developing the system and the benefits derived from the operational system requires a great deal of thought, hard work and ingenuity. The task is made somewhat easier if the analyst has a way to identify and classify both the costs and the benefits associated with the new system.

The reason is Sodexho has been limited the budget to develop a new system, including they want software packages that are well-known and likely to use nowadays. Consequently, they agree to select three alternatives as the candidates of development system. All three candidates are comprised of alternative I-Business Plus current software package, alternative II-AccPac software package, and alternative III-Platinum software package.

This project costs and benefits are classified in terms of "Tangible and intangible". A tangible cost or benefit can be quantified and assigned a monetary value. Both costs and benefits are specified to be the important parts in comparison to all alternatives. Their values should be calculated carefully and closely the feasibility.

#### 4.4.1 The Estimated Costs

Tables 4.1-4.3 show the estimated costs of alternative I-Business Plus, alternative II-AccPac, alternative III-Platinum by consecutive. Each one is comprised of research & development costs, investment costs, and operating costs.

R&D cost is itemized in the first year as expenditure, such as stationery, tape, papers, transportation fee, and telephone fee, etc., because preliminary investigation of all alternatives have been done fairly the same, R&D costs of these alternatives are estimated at the same.

Investment costs are classified at first year by application of hardware system, software system, installation & testing, initial training, data conversion, and project management. As the current system is an available hardware system, so that a new system should not only require to upgrade the capacity of some components but it should be considered in the expansion of the point of network to support the most efficient operation and quality of producing. Each alternative is estimated in different monetary values, because it has separate minimum hardware and software requirements, which includes different installation & testing, initial training, data conversion, and project management that are itemized by relying on an additional condition of each alternative.

The operating costs are comprised of annual training, maintenance and so on. They are estimated to manage annual activities in Sodexho over five years. Some items,

such as hardware and software maintenance, can be estimated easily, because they have the exact number to calculate the monetary value. For the rest, such as salary/wage for MIS personnel is difficult to estimate. However, we itemize the operating cost by holding on policy and asking rough budgets from the executive manager of Sodexo.

The basic costs and benefits of implementing an information system are analyzed for 5 years period. Research & Development and Investment costs are summarized at the first year, and operating costs over all five years. Including, we put the mentioned financial models to estimate the return on investment capital. They are comprised of the payback period, the accounting rate of return, the cost-benefit ratio, the net present value, and the internal rate of return to determine the financial basis for this project.

The quantitative analysis or cost-benefit analysis of all alternatives are summed up and estimated in Table 4.7. This table is illustrated to conclude total costs and benefits for determination select the best software package. The reason to choose which software package will be explained in the section of the results of the Cost-Benefit Analysis.



Table 4.1. The Estimated Costs of Business Plus Software Package.

Details		@	Total
(1) Research & Development Costs			
(a) Preliminary investigation		19,000	19,000
Total Research & Development Costs		19,000	19,000
(2) Investment Costs			
(a) Hardware System			
(1) Upgrade Current System		22,000	22,000
(2) Telecommunication System	3 points	12,600	12,600
Total Hardware System			34,600
(b) Software System			
(1) Operating System Software		-	-
(2) General Purpose Software		-	-
(3) Specific Purpose Software		-	-
Total Software System		-	-
(c) Installation & Testing		-	-
(d) Initial Training		-	-
(e) Data Conversion		-	-
(f) Project Management		-	-
Total Investment Costs			34,600
(3) Operating Costs			
(a) Salary/wage for MIS personnel	3 persons	18,000	648,000
(b) Consulting Fee	12 mths.	5,000	60,000
(c) Annual Training	3 times	6,000	18,000
(d) Hardware Maintenance	10%	642,400	64,240
(e) Software Maintenance	10%	84,900	8,490
(f) Other MIS Expenses	12 mths.	5,000	60,000
Total Operating Costs			858,730
Total Costs			893,330

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Table 4.2. The Estimated Costs of AccPac Software Package.

Details		@	Total
(1) Research & Development Costs			
(a) Preliminary Investigation		19,000	19,000
Total Research & Development Costs		19,000	19,000
(2) Investment Costs			
(a) Hardware System			
(1) Upgrade Current System		42,000	42,000
(2) Telecommunication System	3 points	12,600	12,600
Total Hardware System			54,600
(b) Software System			
(1) Operating System Software		330,000	365,300
(2) General Purpose Software		573,000	597,600
(3) Specific Purpose Software		245,000	219,600
Total Software System			1,182,500
(c) Installation & Testing	—	30,000	30,000
(d) Initial Training	7 users	5,000	35,000
(e) Data Conversion	—	30,000	30,000
(f) Project Management	12 mths.	25,000	300,000
Total Investment Costs			1,632,100
(3) Operating Costs			
(a) Salary/wage for MIS personnel	3 persons	18,000	648,000
(b) Consulting Fee	12 mths.	5,000	60,000
(c) Annual Training	3 times	6,000	18,000
(d) Hardware Maintenance	10%	662,400	66,240
(e) Software Maintenance	15%	1,148,000	172,200
(f) Other MIS Expenses	12 mths.	5,000	60,000
Total Operating Costs			1,024,440
<b>Total Costs</b>			<b>2,675,540</b>

Table 4.3. The Estimated Costs of Platinum Software Package.

Details		@	Total
(1) Research & Development Costs			
(a) Preliminary Investigation		19,000	19,000
Total Research & Development Costs			19,000
(2) Investment Costs			
(a) Hardware System			
(1) Upgrade Current System		28,000	28,000
(2) Telecommunication System	3 points	12,600	12,600
Total Hardware System			40,600
(b) Software System			
(1) Operating System Software		65,000	65,000
(2) General Purpose Software		1,066,000	1,257,600
(3) Specific Purpose Software		546,000	542,800
Total Software System			1,865,400
(c) Installation & Testing	—	40,000	40,000
(d) Initial Training	7 users	3,000	21,000
(e) Data Conversion	—	40,000	40,000
(0 Project Management	12 mths.	25,000	300,000
Total Investment Costs			2,307,000
(3) Operating Costs			
(a) Salary/wage for MIS personnel	3 persons	18,000	648,000
(b) Consulting Fee	12 mths.	5,000	60,000
(c) Annual Training	3 times	6,000	18,000
(d) Hardware Maintenance	10%	648,400	64,840
(e) Software Maintenance	15%	1,677,000	251,550
(0 Other MIS Expenses	12 mths.	5,000	60,000
Total Operating Costs			1,102,390
<b>Total Costs</b>			<b>3,428,390</b>

#### 4.5.2 The Estimated Benefits

The quantitative benefits are another important part in consideration to select the best software package. Each item of benefits came from the probability that may occur after starting the operating system of a new software package. We specify items of each alternative in the same details for obviousness in consideration. The items of benefit will be more clearly described in the following details:

##### (1) Lower operational costs

Because the operating system needs the potential of MIS personnel and the efficiency of software package, the salary/wage of MIS personnel and the most efficient capability of operating system are the important parts to estimate this benefit. So alternative II-AccPac and III-Platinum show operational cost in lower level than alternative I, because they have more efficient operating system than another one does.

##### (1) Reduced work force

Generally, the software package system can concurrently operate the systems and it does not need more work forces to put in each position. As a result, Sodexho can reduce work force in part of clerical staff after put a new software package in operating system. All candidates are software package, so we estimate to reduce personnel in the same value.

##### (3) Reduced clerical work

Clerical errors are an intrusion of operating system, so the company should select software package that can improve more correctness outputs and create more advantage in operation system as well. For example, alternative II-AccPac and III-Platinum can reduce some faults more than

alternative I do because their operating system can operate job more efficiently.

(4) Reduced rate of growth in expenses

The expenditure will be increased from tardiness and error of operating system, including semiautomatic system that is the reason of loss the money in expenses. As a result, the operating system that has inadequate capabilities to operate data will take time and money to operate data. The reason is alternative I-Bussiness Plus still uses the current software package in semiautomatic system, so its expenses grow up extremely while both alternative II and III can reduce their expenses satisfactorily.

(5) Improve management system

The management system needs both accounting and production application software package in the same one to improve the efficiency of the operation system. Furthermore, the complimentary application software package will help personnel to organize the system more conveniently. As a result, alternative II-AccPac and III-Platinum can speed up this item automatically due to managing under the control of congruent system, while this item can be less improved on alternative I.

(6) Improve business opportunity

The more rapidly manufacture the more business opportunity. So the application software package has to cover production requirement to maximize efficiency in operating system of manufacturing. The selective software package should support the quality control system to control the

quality of product in each producing. Noticeably that alternative I improved business opportunity such alternative II-AccPac and III-Platinum does, but it could not gain as appreciable number as the others could.

The estimated benefits of each candidate are summarized in Tables 4.4-4.5. All benefits will be depicted in the same items for a clarification of comparison.

Table 4.4. The Estimated Benefits of Business Plus Software Package.

Details			@	Total
(1)	Lower Operational Costs	13%	648,000	84,240
(2)	Reduced Work Force	6 persons	7,500	540,000
(3)	Reduced Clerical	12 mths.	4,000	48,000
(4)	Reduced Rate of Growth in Expenses	-	-	-
(5)	Improved Management System	—	100,000	100,000
(6)	Improved Business Opportunity	—	100,000	100,000
Total Benefits				872,240

Table 4.5. The Estimated Benefits of AccPac Software Package.

Details			@	Total
(1)	Lower Operational Costs	35%	648,000	226,800
(2)	Reduced Work Force	6 persons	7,500	540,000
(3)	Reduced Clerical	12 mths.	10,000	120,000
(4)	Reduced Rate of Growth in Expenses	—	300,000	300,000
(5)	Improved Management System	—	250,000	250,000
(6)	Improved Business Opportunity	—	250,000	250,000
Total Benefits				1,686,800

Table 4.6. The Estimated Benefits of Platinum Software Package.

Details			@	Total
(1)	Lower Operational Costs	35%	648,000	226,800
(2)	Reduced Work Force	6 persons	7,500	540,000
(3)	Reduced Clerical	12 mths.	10,000	120,000
(4)	Reduced Rate of Growth in Expenses	—	300,000	300,000
(5)	Improved Management System	—	250,000	250,000
(6)	Improved Business Opportunity	—	250,000	250,000
Total Benefits				1,686,800

#### 4.5 Results of the Cost-Benefit Analysis

Sodexho considers selecting AccPac software package as the best project and all of three alternative proposals will be compared to sum up in Table 4.7. We now describe in following detail why the firm chooses this project by using the result of capital budgeting models in Table 4.7 to render a decision.

- (1) Payback period : AccPac software package project takes only 2.6 years that is the least number of period in the group of three alternatives. The lesser number of years the more convenient to pay back the initial investment. As the payback is simplified, the project of AccPac should be selected as the best software package.
- (2) ROI : The average rate of return on the investment of AccPac software package project is up to 12.41% that is the highest rate among three alternatives. The return on invested capital in bonds are at about 8.5 %. In



this case, the firm should select this project to put down capital because it returns more than the bonds.

- (3) NPV : The net present value of AccPac software package project over a-five year period is 1,088,373 bahts. It is the maximum value in the midst of three alternatives. If the firm makes decision invested a 2,675,540 bahts in this project today, it will gain 1,088,373 bahts. The remaining amount is a good rate of return on investment that the firm should obtain the most.
- (4) B/C ratio : The cost-benefit ratio of AccPac software package project is the highest ratio as compared with the other projects. It is 1.25, meaning that the benefits are 1.25 times greater than the costs. For the better return on investment, this project should be considered to invest more than Business Plus or Platinum software package project.
- (5) IRR : From the comparative analysis table, the internal rate of return of AccPac software package project is 55.55 %. It is the most healthy rate of return that implies to the maximum profit earned from investment in this project. As this project can make the return on investment in the highest volume, it should be considered as the best alternative and the worth investment.

Not only the tangible costs-benefits are considered but also an intangible benefit is an important consideration for the selection of software package, because the intangible benefits are implied as qualitative analysis. However, an estimation of the intangible benefits is more difficult than the tangible costs- benefits analysis is done.

Table 4.7. The Cost-Benefit Analysis in Implementing Application Software Packages for 5 Years Period.

Alternative	Period of Project					Total
	2000	2001	2002	2003	2004	
<b>(I) Business Plus</b>						
- Costs	893,330	858,730	858,730	858,730	858,730	4,328,250
- Benefits	872,240	872,240	872,240	872,240	872,240	4,361,200
- Benefits-Costs	(21,090)	13,510	13,510	13,510	13,510	32,950
- Pay Back Period	(21,090)	(7,580)	5,930	19,440	32,950	
- ROI	1%					
- NPV (8.5%)	21,349					
- B/C Ratio	1.01					
- IRR	52.08%					
<b>(II) AccPac</b>						
- Costs	2,675,540	1,024,440	1,024,440	1,024,440	1,024,440	6,773,300
- Benefits	1,686,800	1,686,800	1,686,800	1,686,800	1,686,800	8,434,000
- Benefits-Costs	(988,740)	662,360	662,360	662,360	662,360	1,660,700
- Pay Back Period	(988,740)	(326,380)	335,980	998,340	1,660,700	
- ROI	12.41%					
- NPV (8.5%)	1,088,373					
- B/C Ratio	1.25					
- IRR	55.55%					
<b>(III) Platinum</b>						
- Costs	3,428,390	1,102,390	1,102,390	1,102,390	1,102,390	7,837,950
- Benefits	1,686,800	1,686,800	1,686,800	1,686,800	1,686,800	8,434,000
- Benefits-Costs	(1,741,590)	584,410	584,410	584,410	584,410	596,050
- Pay Back Period	(1,741,590)	(1,157,180)	(572,770)	11,640	596,050	
- ROI	3.48%					
- NPV (8.5%)	159,172					
- B/C Ratio	1.08					
-IRR	12.91%					
<b>Selection Results: (II) AccPac Software Package</b>						

generally more valuable than a program that is totally inflexible. However, software that has excessive flexibility is not desirable. Area where flexibility is wanted are data storage, reporting and options, definition of parameters, data input, and output. In addition, the flexibility of software varies according to the types of hardware it will support.

From the features of each alternative, alternative III-Platinum shows that they can meet user requirements in more part than alternative II-AccPac can, while alternative I-Bussiness Plus can not. As a result, the operating system that is supported by alternative III-Platinum could be better operated than the rest of them.

(3) More timely information

Through sophisticated communication links, organizations can transmit data almost instantaneously. One benefit of this is that work can be done faster and more accurately. Better service is yet another benefit. The organizational systems that some companies have set up with their supplier so that materials are always available when needed are important to note.

Because alternative II-AccPac contains the entire tool user needed, it can operate the firm and deliver accurate and timely information. The result is an effective business management system will emerge as analysis and forecasting can do more rapidly and correctly.

(4) Increased organizational learning

The organization knowledge base emphasizes the collection, storage, dissemination, and use of knowledge and information. Its basic premise is that the success of the organization—survival and efficiency— depends on the

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organization's ability to gather, produce, maintain, and disseminate knowledge which is used to produce products and services.

Alternative III-Platinum shows configuration in easy way to learn and makes users to become proficiency, while alternative I-Bussiness Plus is not systematic and alternative II-AccPac is complicated package.

### (5) Increased job satisfaction

An information system meets user needs if it accomplishes the following:

- (a) Performs the right procedures properly.
- (b) Presents information and instructions in an acceptable and effective fashion.
- (c) Produces accurate results.
- (d) Provides an acceptable interface and method of interaction.
- (e) Recognizes from users as a reliable system.

Because Alternative III-Platinum is mentioned that it is easy package to learn, so it could provide job satisfaction to users more than alternative II-AccPac and alternative I-Bussiness Plus could.

### (6) Improved decision making

Decision making is a key task for managers at all levels in large and small organizations. The managers will define the situation for both employees and the firm. They increase firm value, effectiveness, and efficiency, insofar as they are correct in their sense-making. If they are incorrect, the organization loses effectiveness, efficiency, and ultimately fails.

Because alternative II-AccPac has many more information technology tools than Alternative III-Platinum and alternative I-Bussiness has, so that those tools can increasingly aid the managers to make decision and solve problems in organization.

(7) Improved operations

Operations include scheduling of jobs, allocation of resources to specific jobs, and supervision of the operation staff. Additionally, it is necessary to monitor the performance of the system to determine if service levels are adequate.

An alternative II-AccPac can improve the efficiency of organization planning, the decision making, and provide more timely information to all users, so all users can reduce response time to cooperate each other in operating system.

(8) Better corporate image

Organizations have a competitive advantage when they provide more value their customers or when they provide the same value to customers at a lower price. An information system could have strategic impact if it helped the firm provide products or services at a lower cost than competitors or if it provided products and services at the same costs as competitors but with greater value. It has to involve improvements in decision making (speed, accuracy, comprehensiveness), serving ever higher customer and client expectations, coordinating dispersed groups in an organization, and exercising tighter control over personnel and expenditures.

From the same reason in the item of improvement operations, alternative II-AccPac can increase efficiency and save money that is the vitally important simply for staying in business. As a result, it can transform corporate image among a group of staffs to better way.

For the qualitative analysis or the intangible benefit analysis that is explained in mentioned section will be summed up in Table 4.8 following this:

Table 4.8. The Intangible Benefits Analysis of Each Application Software Package.

Intangible Benefits		Alternatives		
		I) Business Plus	II) AccPac	III) Platinum
(1)	Improved organizational planning	Low	High	Medium
(2)	Increased organizational flexibility	Low	Medium	High
(3)	More timely information	Low	High	Medium
(4)	Increased organizational learning	Low	Medium	High
(5)	Increased job satisfaction	Low	Medium	High
(6)	Improved decision making	Low	High	Medium
(7)	Improved operations	Low	High	Medium
(8)	Better corporate image	Low	High	Medium
Selection Results: II) AccPac Software Package				

#### 4.7 Information System to Management Benefits and Problems

Because end users can create many applications entirely on their own or with minimal assistance from information systems specialists, end-user-developed information systems can be created much more rapidly and informally than a traditional system. This situation has created both benefits and problems for organizations because these systems are outside the constraints of the formal information system environment. Without question, end-user development provides many benefits to organizations. These include the following:

- (1) Improved requirement determination. With users developing their own systems, there is less need to rely on information systems specialists for requirements analysis and less chance that user requirements will be misinterpreted by technical specialists.
- (2) User involvement and satisfaction. Users are more likely to use and approve systems they design and develop themselves.
- (3) Control of the systems development process by users. Fourth-generation tools enable end users to take a more active role in the systems development process. Users can create entire applications themselves or with minimal assistance from information systems professionals. The tools often support prototyping, allowing end users to create experimental systems that can be revised quickly and inexpensively to meet changing requirements. With end users playing a much larger role in application creation, fourth-generation tools have helped break down the barrier between users and programmers that has hampered conventional systems development.



- (4) Reduced application backlog. User-developed systems can help relieve the application backlog by transferring the responsibility for development from the information systems staff to end-users. The productivity of professional information systems specialists can also be boosted by the use of fourth-generation languages.

At the same time, end-user computing poses organizational risks because it occurs outside of traditional mechanisms for information systems management and control. Most organizations have not yet developed strategies to ensure that end-user-developed applications meet organizational objectives or meet quality assurance standards appropriate to their function. The most critical challenges posed by end-user computing are the following:

- (1) Insufficient review and analysis when user and analyst functions are no longer separate. Without formal information systems analysts, user-developed applications have no independent outside review. There are no independent sources of problem analysis or alternative solutions. It may also be difficult for users to specify complete and comprehensive requirements.
- (2) Lack of proper quality assurance standards and controls. User-developed systems are often created rapidly, without a formal development methodology. Although there are productivity and design advantages to be gained by avoiding conventional development methodologies, user-developed systems often lack appropriate standards, controls, and quality assurance procedures. There may not be adequate disciplines for testing and documentation. User-developed systems may lack controls for the

completeness and validity of input and updating audit trails, operating controls, project controls, and standards for stable interfaces among subsystems.

- (3) Uncontrolled data. With end-user computing tools, end-user groups outside the traditional information systems department can easily create their own applications and files. Many of these end-user-created files will contain the identical pieces of information, but each user application may update and define these data in a different way. Without formal data administration disciplines, it ensure that the same piece of information (such as product number or annual earnings) is used consistently throughout the organization.
- (4) Proliferation of "private" information systems. Users can use fourth-generation tools to create their own "private" information systems that are hidden from the rest of organization. Such systems can conceal information from other groups. An undocumented private system cannot be easily turned over to another individual when the creator of that system leaves the job (Davis and Olson 1985).

Although some requirements of users can not meet by AccPac software package, but users can deal with vendors to ask for additionally modification of software package configuration. In addition to applying the best software package, training personnel should be considered periodically. The training program schedule should be provided to users while the operating system of AccPac software package is being learned.

## **V. THE PROJECT IMPLEMENTATION**

### **5.1 Management of the Implementation Process**

Implementation is the process of having systems personnel check out and put new equipment into use, train users, install the new application, and construct any files of data needed to use it.

The development of a new system must be carefully managed and orchestrated. Each project involves research and development. Requirements are hard to define at the level of detail for automation. The same piece of information may be interpreted and defined differently by different individuals. Multiple users have different sets of requirements and needs. Costs, benefits, and project schedules must be assessed. The final design may not be easy to visualize. Because a complex information system involves so many interest groups, actors, and details, it is sometime uncertain whether the initial plans for a system are truly feasible.

Often Basic elements of success are forgotten. Training to ensure that end users are comfortable with the new system and fully understand its potential uses is often sacrificed or forgotten in a system development project, partly because the budget is constrained toward the end of a project, and at the very point of startup there are insufficient funds for training.

Given the challenges of innovation and implementation, it is not surprising to find a very high failure rate among business reengineering projects, which typically require extensive organizational change. In some case, the problems stem from management's inability to identify the critical problems to be solved by reengineering or distinguishing between radical revamping of core business processes and incremental changes. In such

instances, a company winds up only making incremental improvements in ongoing operations instead of radically redesigning their business processes. Dealing with fear and anxiety throughout the organization, overcoming resistance by key managers, changing job functions, career paths, recruitment, and training pose even greater threats to reengineering than the company's difficulties with visualizing and designing breakthrough changes to its business process. Reengineering problems are path of the larger problem of organizational implementation and change management.

## 5.2 The Systems Implementation

In the last chapter, we consider selecting AccPac-software package as a new system. All activities of Sodexho will work toward the adoption, management, and routinization of the selected software package. This process will improve completeness of this project before users start the utilization process. All of them are called the implementation processes that will be itemized into project scheduling, program testing, training, and conversion as the following.

### 5.2.1 Project Scheduling

To ensure that the system can work by a certain date, on time, the timetable showing activities related to implementation must start and finish. The tools chosen to establish an implementation timetable is 'Gantt chart'. It is a project modeling tool that uses a bar chart representation of project tasks. The project schedule will explain the implementation activities that will help both personnel and system to work efficiently.

### 5.2.2 Program Testing

Program testing is performed to detect errors in the software. Misunderstanding of the program specifications or as a result of mistakes in the code itself may cause these errors. System testing has made to ensure that all programs making up the new system

effectively work altogether. The acceptance of testing is also considered. To evaluate the extent, to which the new system meets user requirements under normal conditions, re-checking process takes place to check as the last step before developing to operation.

AccPac software package can submit the ability in many ways. Users can gain benefits and improve problems in many parts. However, the limitation of configuration is still effect to fit the need of users. Its inability might cause the system to fail. But we found that these failures can adapt and are not the important problems, so that we will conclude them in following details:

- (1) Some format of report can not meet the user requirements at all by the AccPac software package.
- (2) Taking more training to understanding and use the AccPac software package because of a large extent of each module and difficulty in learning.
- (3) The AccPac can not run on the current model of computer because its hardware resources are not compatible with the software implementation of speed.
- (4) It has to take much time to convert from the current system to the package software system.
- (5) Probably, the AccPac software package will discourage the user satisfactions in the beginning point of learning or using because of unfamiliarity with a new software package.

### 5.2.3 Training

Virtually any successful systems implementation requires that considerable attention be devoted to employee training. In some cases, new employees must be hired

and trained. In other cases, existing employees must be taught to work with new forms, reports, and procedures.

The importance of adequate training cannot be overemphasized. We should never assume that employees will learn to use the system by themselves. If employees are not adequately trained, it is likely that they will simply ignore the new system. Therefore, the quality of training received by the personnel involved the system in various capacities helps or hinders, and may even prevent, the successful implementation of an information system. Those who will be associated with or affected by the system must know in detail what their roles will be, how they can use the system, and what the system will or will not do. Both systems operators and users need training.

#### (1) Systems Operators Training

Many systems depend on the computer-center personnel, who are responsible for keeping the equipment running as well as for providing the necessary support service. Their training must cover the handling of all possible operations, both routine and extraordinary. The performance of routine operation involve the data entry personnel, the installation of new system, and the production of a report. Operators should be instructed in what common malfunctions may occur, how to detect them, and what steps to take when they arise.

Training also involves familiarization with run procedures, including the mounting magnetic disks or tapes, copying files, changing printer forms, or turning on communication systems. The operators must know when the various procedures are appropriate and how to accomplish them.

## (2) User Training

When both the application itself and the equipment are new to the users, user training will address fundamental matters first. End-users need to know how to turn on a computer on a workstation, how to insert a diskette into a microcomputer, and how to load a program into the system. They also want to be sure when it is safety to turn off equipment without the danger of data loss. These are significant problems to new users who are not familiar with computers.

User training must also instruct individuals in troubleshooting the system, determining whether a problem that arises is caused by the equipment or software or by something they have done in using the system. Including a troubleshooting guide in systems documentation will provide a useful reference long after the training period is over.

Most user training deals with the operation of the system itself. Training in data handling or entry of details into the system includes both learning how to enter the data and recognizing what the data should look like. Users must be shown how to add data, make changes or edit them, formulate inquiries to retrieve specific information, and delete records of data. These functions are the most basic features of the system, and the person conducting the training session must make sure everyone understands them and can perform them comfortably.

The details of training will be described again in the section of training program, including the training schedule to improve both users and system at the same time.



#### 5.2.4 Conversion

Conversion is the process of changing from the old system to the new one. It includes the creation of all required master and transaction files, establishing backup copies of master files and databases, and converting tested programs to operating status. Data conversion must be carefully planned and also cross-checked to see that it is done right. We consider the ramifications of transferring a file from manual to computer-based system with checking for completeness and accuracy.

#### 5.3 The Training Program

Training requires the full commitment and support of top management, supervisory personnel, and the collective bargaining unit. Top management must insure that personnel and funding are adequate to provide the training programs needed by the enterprise to remain competitive and to meet the needs of its employees. Supervisors must be able to identify the specific training needs of their subordinates and assist them to acquire the knowledge and skills they need to succeed in their occupations and to progress in their career fields. Unions must recognize the importance of training and encourage their members to take advantage of opportunities for training.

Training programs and activities must focus on problems that can be solved by training. Mainly, those relate to the remediation of deficiencies in knowledge, skills, and attitudes. Training programs should now attempt to solve management problems, such as performance deficiencies attributable to lack of interest or commitment, dissatisfaction with working conditions, inadequate supervision, or improper management controls.

Training program must meet organizational needs and the needs of all employees and cut across all divisions and units. In addition to meeting the individual needs of

employees, training must be job-relevant and sufficiently comprehensive to improve employee behavior and performance. Also, it must be offered at the appropriate levels for participants to derive maximum benefit.

All employees must be afforded opportunities to participate in training programs. No group of employees should be segregated, separated, or treated differently from any other group.

The pattern and arrangement of training opportunities must complement and implement the philosophy of the organization. Offerings must be balanced, well organized, and properly sequenced, provide adequately for differing needs and abilities, offer sufficient flexibility to both managers and trainees, and be responsive to change. And they must stimulate growth in required knowledge, skills, habits, and attitudes, and encourage self-improvement and self-direction.

All training programs must be developed through a systematic and orderly process. They must be built upon a firm foundation of precisely defined job performance requirements, which have been translated into specific learning objectives that describe the behaviors, conditions, and standards of performance. The materials used in the programs must be structured and sequenced to provide an integrated skill building progression of learning experiences commensurate with training needs, trainee abilities, and job requirements. They must employ delivery systems that are selected on the basis of training effectiveness, available technology, cost-effectiveness, and results. They must be validated to insure effectiveness prior to full-scale implementation. And they must include evaluation and feedback channels and mechanisms to enable refinement, updating, and continuing effectiveness.

Finally, training programs must employ sound principles of adult learning. They should provide trainees with opportunities to diagnose their own deficiencies and determine their own needs. They must involve trainees directly and completely in planning, executing, and evaluating the training program and in assessing their own progress and accomplishment. Training strategies and content must make full use of the backgrounds, experiences, and talents of trainees. Issues, materials, and exercises must involve real problems. And ample opportunities must be provided to trainees to apply and practice newly acquired knowledge and skills.

Once we studied this company, we found one important problem that stemmed from lacking of adequate training to both managers and staffs. Training programs have not been adjusted to meet the challenge of educating workers for the rapidly changing technology, including executive and supervisory level also.

For many trainers, the design process is where the most excitement and the real fun. This is perfectly understandable, since program delivery is where the teacher meets students, precisely the interaction point that most trainers like best. Moreover, program delivery is concrete, familiar work with tangible outcomes, additional reasons for its appeal. It is important, therefore, to make sure that the "what" of training receives due attention in the design process.

User training program has to be developed because the main function of company business is not in efficiency operation. Most of the employees are familiar with the manual system more than the computer information system. The training program is a necessity.

- (1) The training has to start from how to use computer. Get them familiar with the computer.

- (2) Know how to use the system software for the most efficiency of operating system.
  - (3) Determine training resources with limited resources in the division. We have to prepare all facilities ready for training.
  - (4) Develop training program after all resources and users are available.
  - (5) Implement the training program by using 'Instructor-led methods' that help all trainees to learn faster and more effectively when interact to each other.
- However, after the program has operated the users have to try to get themselves to be familiar with computer for better understanding.

Base on the survey of the problems of Sodexho from some personnel and documentation, we found that this company needs to train and develop both users and the operating system. Training schedule will be used as a tool in training personnel. It will be created to introduce all concerning users. We will separate training table by holding on group of training in 2 parts, one is an operating level and another is an executive and supervisory level.

The training schedule comprises of program name, program goal, activity, timing, materials, and costs. These items will be summed up in Tables 5.1 and 5.2 and described to their specification in this following details:

- (1) Program name defined what the program is called.
- (2) Program goal defined what the program needs.
- (3) Activities defined the performance that trainer need to train users.
- (4) Timing estimated from each one of activities.
- (5) Materials specified which materials are used in each of activities.
- (6) Costs specified how many costs are estimated to spend in each of activities.

Table 5.1. The Training Schedule Program.

Part I: The Operating Level (There are 10-15 persons.)

<b>Program Name:</b> Training and Development Personnel in Organization.			
<b>Program Goal:</b> Development Potential in Operation of Personnel.			
Activities	Timing	Materials	Costs
(a) Reviewing the basic English to prepare users for using AccPac software package on English.	January 1-15	Handouts.	300-500 Bahts
(b) Training users to familiar with using PC and PC on AccPac software package.	January 16-31	Handouts.	300-500 Bahts
(c) Specifying responsibility of each user and training them to key in data and print out any reports on AccPac software package.	February 1-28	Handouts.	300-500 Bahts
(d) Training the method to learn any commands or languages on AccPac software package and able to use each of them to retrieve data concurrently.	March- April	Demo, Handouts.	800- 1,500 Bahts
(e) Training the method to operate AccPac software package for all personnel in accounting and production department.	May- July1-15	Demo, Handouts.	800- 1,500 Bahts
(f) Evaluating training for users in operating level.	July 16-31	Handouts, Games, Chart	300-800 Bahts

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Table 5.2. The Training Schedule Program.

Part II: The Executive and Supervisory Level (There are 3-4 and 4-5 persons.)

Program Name: Training and Development Personnel in Organization.			
Program Goal: Development Potential in Operation of Personnel.			
Activities	Timing	Materials	Costs
(a) Training the executives and managers to familiar with using PC and PC on AccPac software package.	August 1-15	Handouts.	100-300 Bahts
(b) Training the basic accounting and introduce the executives and managers to read the financial statement.	August 16-31	Handouts.	100-300 Bahts
(c) Training the executives and managers how to ask for data and read computer printouts and outputs (formats, codes, and abbreviations).	September	Demo, Handouts.	800-1,500 Bahts
(d) Training motivation subordinates to the executives and managers such as how to encourage them, when they should offer reward to them.	October	Demo, Handouts.	800-1,500 Bahts
(e) Training the executives and managers to have vision about the current technology and new technology in the future, including practice to be a good leadership.	November	Demo, Handouts.	800-1,500 Bahts
(f) Evaluating training for executives and supervisors, including reviewing the training program to compromise staffs with managers and executives.	December	Handouts, Games, Charts	500-800 Bahts

## VI. CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Conclusions

Sodexho has been running the business in medicine production for a long time, but now it faces many problems that occur from an expansion of competition and technology. As a result, the management team considers improving the system by holding on MIS in developing the management.

After gathering information of this company, the immediate requirement of this company was in finding new software for the accounting system. Yet we also found other problems which need attention by the management as well. Based on the immediate requirement, we start to investigate sources of vendors to find the proposal .vendors. Compare all candidates to user requirements interviewed from the concerned personnel. Select the best software package by relying on a compatible with the existing system. The user requirements are a significant part, so the analyst will hold on them in considering selecting the software package for a new system.

After comparing and selecting all three candidates, we consider that AccPac software package is the best compatible one for Sodexho. It will help the accounting officers to manage the current information system more accurate in a short time and cover the production software to' support expansion of the production system in the future.

Besides, training and development will be applied to all users concurrently for speeding up the standard of working. Training will help managers to motivate and manage subordinates more easily: The personnel will work more correctly and rapidly after they have passed training and development. However, the managers should be careful the situation of leaving of some personnel after they became to be professional.



Generally, they will find a new position that is better and offers higher salary than the current company.

In conclusion, AccPac is the best software package for the company's immediate requirement at the costs of 2,675,540 Bahts and benefits of 1,686,800 Bahts. If they implement AccPac as a new system, they should expect lower costs and higher benefits, available to cover all accounting system, expandable to production system, and enable to improve quality of the management system.

## 6.2 Recommendations

The current hardware and software configurations are used in the workgroup system under the control of Window 95. The capacity memory of each personnel computer in workgroup should be increased and some part of network should be linked in order to support the development of the production system.

Due to AccPac software package can not all completely meet the user requirement at all, so that the users should ask for modification the package from that vendor. In part of production system, we select only the module I to support an expansion in the future. If the company wants to decrease the error of manufacturing completely, they should also consider to module II and III.

Sodexho is facing many problems from the existing system that is operated in both manual and computer-based system. The method in converting the current data to a new system must be more carefully considered. The company should use the parallel system method to operate the new system side by side with the old one to ensure that data will not be lost if a problem arises. We can test the correction or completeness of the information, report of the new system in the real world and compare it with the old system. The parallel system has safety and ensures that the works will not fail, but it

takes time to operate the system. Especially, the higher cost will occur from reiteration works and redundant reports. We must prepare the budget to serve this point.

To give familiarization with the new computer system, the management team of this company should provide training to subordinates periodically. Although AccPac software can reduce daily operation times of staffs and support the production system as the requirements, training and development users should be considered for the maximum for efficiency in operation.

Ideally employee training and development will be a continuing function of the company. If training is to be effective, it must be recognized as a long-run fundamental activity, a total effort, not a single injection administered to clear up some organizational infection.

The simplest and most widely used training approach is on-the-job training (OJT) that implies it will take place on the job. OJT is simple, inexpensive, and direct. If the trainer is capable of teaching, it can produce good results.

The training schedule program is prepared by holding on the documentation, requirements of users, and problems in this company. It could be adapted to the other schedules depending on the changed conditions. However, Sodexho can apply this training schedule if the management team can control the mentioned condition under a new system.

This company should prepare the implementation plan to support the competition that is more increasing, the technology that has changed rapidly, and especially, the management system should be developed and improved significantly. The executives should not authorize subordinates as managers. They should improve themselves to a modern technology and try to update information and learning frequently. The implementation plan will help to manage information systems projects successfully. It

shows the start and finish dates for each task. It will be formed in Gantt chart and illustrated in Table 6.1.

Table 6.1. The Conceptual Development Plans in 5-Year Period.

Activities	1998	1999	2000	2001	2002	2003
1) Survey & Study AccPac						
2) Software Implementation						
(a) System Design						
(b) Purchasing						
(c) Installation & Test						
(d) System Modification						
(e) Conversion						
(f) Initial Training						
(g) Operation						
3) Developing Strategic Plan						
(a) Strategic Analysis						
(b) Marketing Plan						
(c) Production Development Plan						
(d) Management Development Plan						
(e) New IT Projects						
4) New Management Paradigm						

To control the operating system, the managers should separate staffs' responsibility clearly. This method **will** help the manager to audit and trace error data

and cheating personnel more rapidly. The company should have a monthly meeting to conclude the operation in each month.

The financial status of Sodexho has gone down for many years. The company should prepare the budget or cash flow estimation to improve the financial management. To control expenditure and estimate the budget for next month, Balance sheets and Profit & Loss statement should be closed on time. In addition to estimation, the manager should control in and out of documentation every month.

Some departments still operate pass through the manual system that makes the operating system tardy. The company should transform operation of them into the computer-based system. Based on the computer system the operating system can run in better efficiency. Each calculation can specify the more correct value; the standard of outcomes can be better than by the manual system.

Finally, the company should adapt the system from workgroup network to local area network (LAN), because LAN can expand the operating system wider than the current workgroup system. Retrieving data by LAN can do better than the workgroup, because a communication of LAN can travel longer distance than workgroup can.

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