



Online Credit Approval System for
Siam A&C Co., Ltd.

by
Mr. Tawiwat Boonchoo

A Final Report of the Three-Credit Course
CS 6998 System Development Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer Information Systems
Assumption University

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Academic Year November 2003

The Graduate School of Assumption University has approved this final report of the three-credit course, CS 6998 System Development Project, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Information Systems.

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ABSTRACT

Siam A&C Company Limited operates a business of hire purchase services to consumers by passing through company' dealers. Most of the hire purchase products are electrical, computers, furniture and car accessories. This system development project is to develop the information system of Credit and Operations Department and facilitate the credit approval process which currently handles incoming customer's documents manually with a facsimile system. The manual process causes inefficiency in work and poor customer service. This project is named "Online Credit Approval System" which can be called shortly as "OLCAS".

The existing system is based on a manual system. Although PCs in credit and operation department are connected to the local area network in the company, there is no information system in retrieving customer's documents. The existing system leads to insufficient work and poor customer service. Other departments also get inefficient information and this leads to poor work flow.

The proposed system "Online Credit Approval System" or OLCAS is developed as an information system for the Credit and Operations Department. OLCAS can reduce the credit approval turn around time which will lead to good customer service.

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I. INTRODUCTION

1.1 Background of the Project

Siam A&C Co., Ltd. operates a business of hire purchase services to customers by passing through company' dealers. The company principally focuses on electrical goods, computers, furniture and car accessories. This Online Credit Approval System (OLCAS) is designed for Credit and Operations Department of Siam A&C Co., Ltd. Due to the increasing number of customers, the company has to consider an information system for retrieving incoming customer's documents of the Credit and Operations Department to facilitate the internal workflow and also support the customers and the company's dealers.

Currently, Credit and Operations Department has no information system to fully support the department's workflow. Even though a local area network is used in the company, the Credit and Operations Department has no information system to support the verification process of incoming customer's documents. Most of the data are kept in files in the form of documents which are printed out from a facsimile machine but not in the form of a database. To develop the Credit and Operations Department work flow, to solve the problem in the manual system and to develop department workflow efficiency, an information system is a must. It can solve the following problems.

- (1) Difficult to control the manual system
- (2) Delay in sharing information within the department and with other departments
- (3) Turn around time in credit approval process
- (4) Data redundancy
- (5) No data security

- (6) High operation cost
- (7) Data integrity

1.2 Objectives of the Project

- (1) To develop a computerized Online Credit Approval System for the purposed of business and to satisfy the user's requirements by studying the existing system.
- (2) To reduce the problem of data redundancy by using the department's centralized database system.
- (3) To facilitate the work process of other departments in terms of providing customer, product and dealer information, that is sharing information on a database.
- (4) To increase data accuracy and reliability.
- (5) To provide the data security for Credit and Operations Department.
- (6) To improve the work flow efficiency in the Credit and Operations Department.

1.3 Scope of the Project

This Online Credit Approval System (OLCAS) is a computerized information system for the Credit and Operations Department in Siam A&C Co., Ltd. The scope of the project is concerned with 4 major functions in Credit and Operations Department, which are as follows:

- (1) Provide online retrieving of customer's information: Credit and Operations Department is the department that retrieves customer's documents from the centralized database which is sent by dealers, they then verify which customer could be approved. When the customer is approved, an approval code will be issued and sent to dealer. Then the member card will be

submitted to the customer. All approved customer data will be sent to both, the Marketing Department and the Finance and Accounting Department which will convert it to the dealer sales volume.

- (2) Provide Marketing Source Code Information: Credit and Operation Department has to key in marketing source codes which must match with the product, price, terms and promotion period.
- (3) Reduce time consumes in Credit and Operation Department approval process: After retrieving customer's documents from the centralized database, credit analysts will verify customer information through company's existing database. Furthermore, credit analysts have to contact customers to confirm customer's information before issuing approval codes and member cards.
- (4) Generate customer report: Credit and Operations Department has the responsibility to produce reports and submit to the company's database in order to share with the related departments which are Accounting and Finance Department and Marketing Department. The report includes product information and dealer information.

1.4 Project Plan

Online Credit Approval System is planned to be completed in a total of 4 months as shown in Figure 1.1.

The project plan can be categorized under major 3 steps as follows:

- (1) **System Analysis**: 6 weeks will be spent for system analysis including defining the objective and scope, studying the existing system, identifying the existing company system, developing a context diagram, and developing data flow diagrams and cost and benefit analysis. It is necessary to study

how the existing system works and get the user requirements to solve the existing problems.

- (2) System design: 3 weeks will be spent for the system design. System design process includes program interface designs, report designs, database designs, network design and program designs.
- (3) System implementation: 8 weeks or 2 months will be spent for system implementation. System implementation will be the last step in project plan. System implementation includes coding, testing, hardware installation, software installation and conversion.



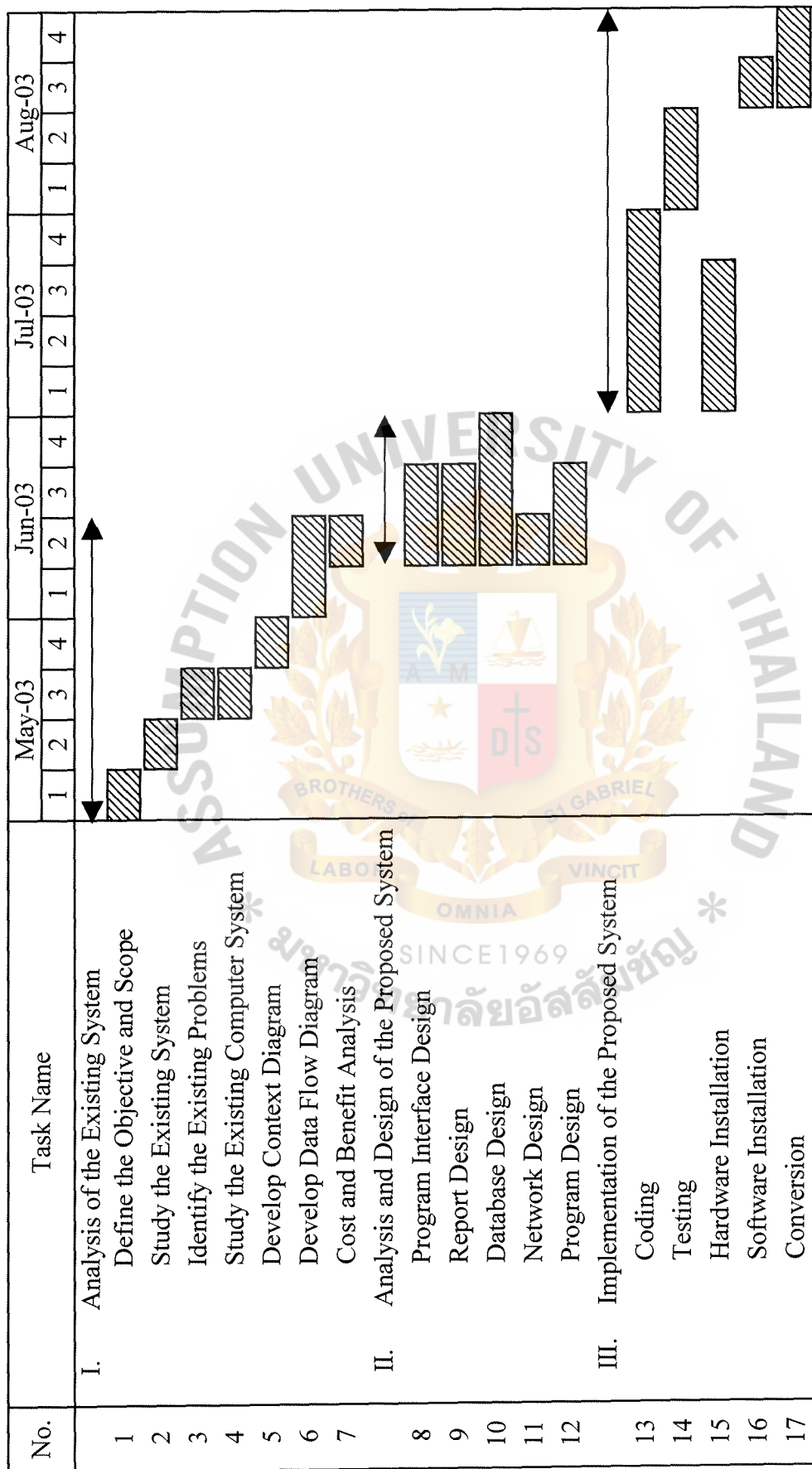


Figure 1.1. Project Plan of Online Credit Approval System.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Siam A&C Co., Ltd., a joint venture company between leading Thai and Japanese companies, was established and has subsequently and smoothly run since 1996. The main purpose of the establishment is to run retail finance business as ACOM Co., Ltd., the parent company, decided to particularly operate Hire-Purchase as an initial step in Thailand. It is located on the 13th Floor, Ramaland Building 952 Rama IV Road, Suriyawongse, Bangrak, Bangkok

Under the aggressive and well-planned business policy of Siam A&C, it has almost been seven years since it has served the first product in Thai market. Understandingly, step-by-step, we are constantly growing in the field of hire purchase products and will carefully extend to new products, which are Personal Loans and Tied-ip Loans, to the elegance market.

Easy Buy Card, our company membership card, is the key-product of our marketing strategy that tries to gather many segment customers

For the company organization chart, refer to Figure 2.1. There are 5 departments in the organization, which are Marketing Department, Credit and Operations Department, Finance and Accounting Department, Collection and Legal Department and Human Resource Department. There are 10 members in the management board. The total number of employees is 471.

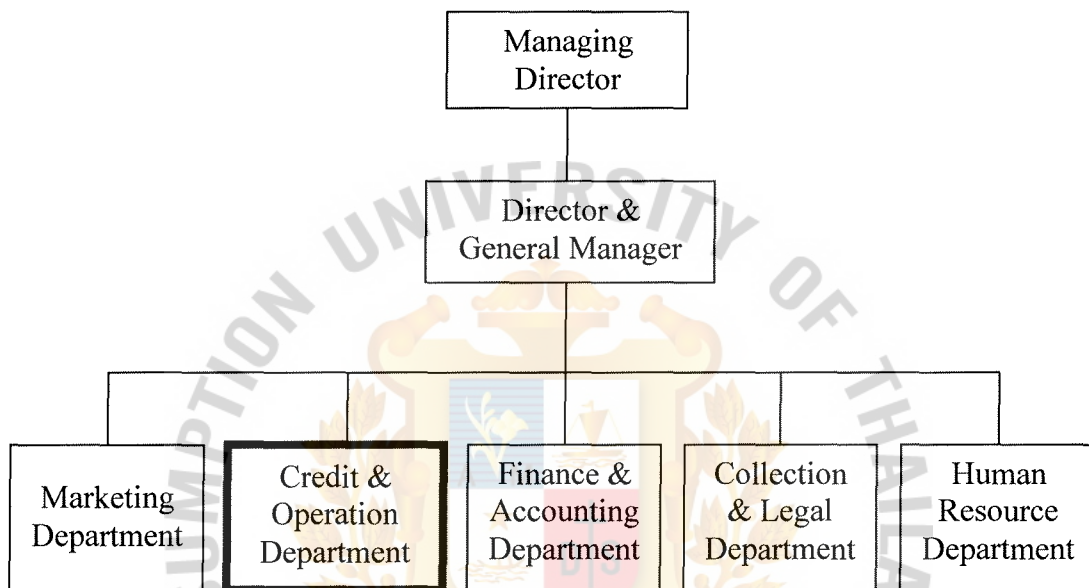


Figure 2.1. Organization Chart of Siam A& C Company Limited.

2.2 Existing Business Function

There are five main business function departments in the company. The existing business function of Siam A&C Co., Ltd. is as follows:

- (1) Marketing Department: Marketing department is responsible for analyzing the dealer sales volume and port folio performance. This department's activities include marketing plans and strategy, pricing strategy and sales strategy.

Vendor will first contact Marketing Department to apply for company's dealership. After the vendor signs the contract, they become a company dealer. They can serve customers who wish to make hire purchases with the company by submitting all customer's document to Credit and Operations department of the company. Marketing Department will monitor dealer sales volume and port folio performance through the reports.

- (2) Credit and Operations Department: The department is responsible for operating incoming customer applications and organizing all customers' documents.

Credit and Operations Department receives customer's document from a facsimile machine. Operation staff key in all customer information into the system and pass the documents to the credit analyst. Credit analyst will verify customer's document by searching related data through the existing database. After the verification process is finished, when the customer is approved, an approval code will be faxed to the dealer and a member card is sent to customer. To understand more see Figure 2.2 Context Diagram of the Existing System and Figure 2.3 Data Flow Diagram of the Existing Diagram.

- (3) Finance and Accounting Department: This department is responsible for management of capital, fund management and business transactions recording in the company. Main activities include payment to company dealers.
- (4) Collection and Legal Department: This department is responsible for collecting late customer installments and anything concern is legal issues.
- (5) Human Resource Department: The department is responsible for human resources of the company including employees' salary, working hours, training courses and other related matters of the company.



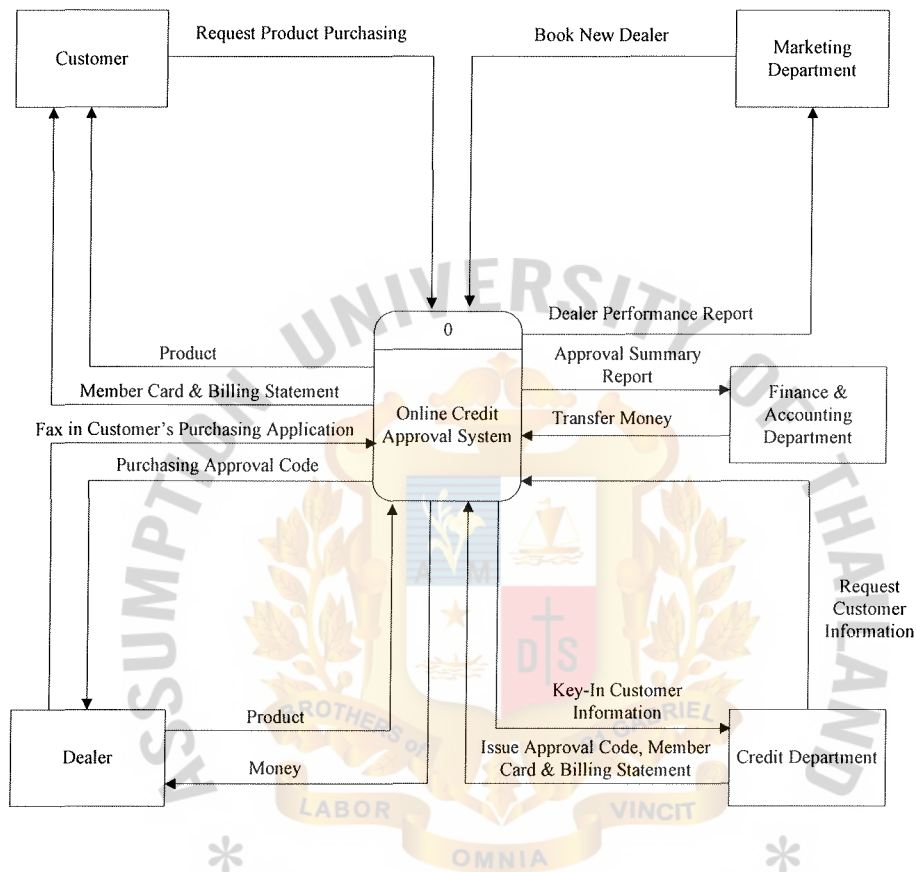


Figure 2.2. The Context Diagram of the Existing System.

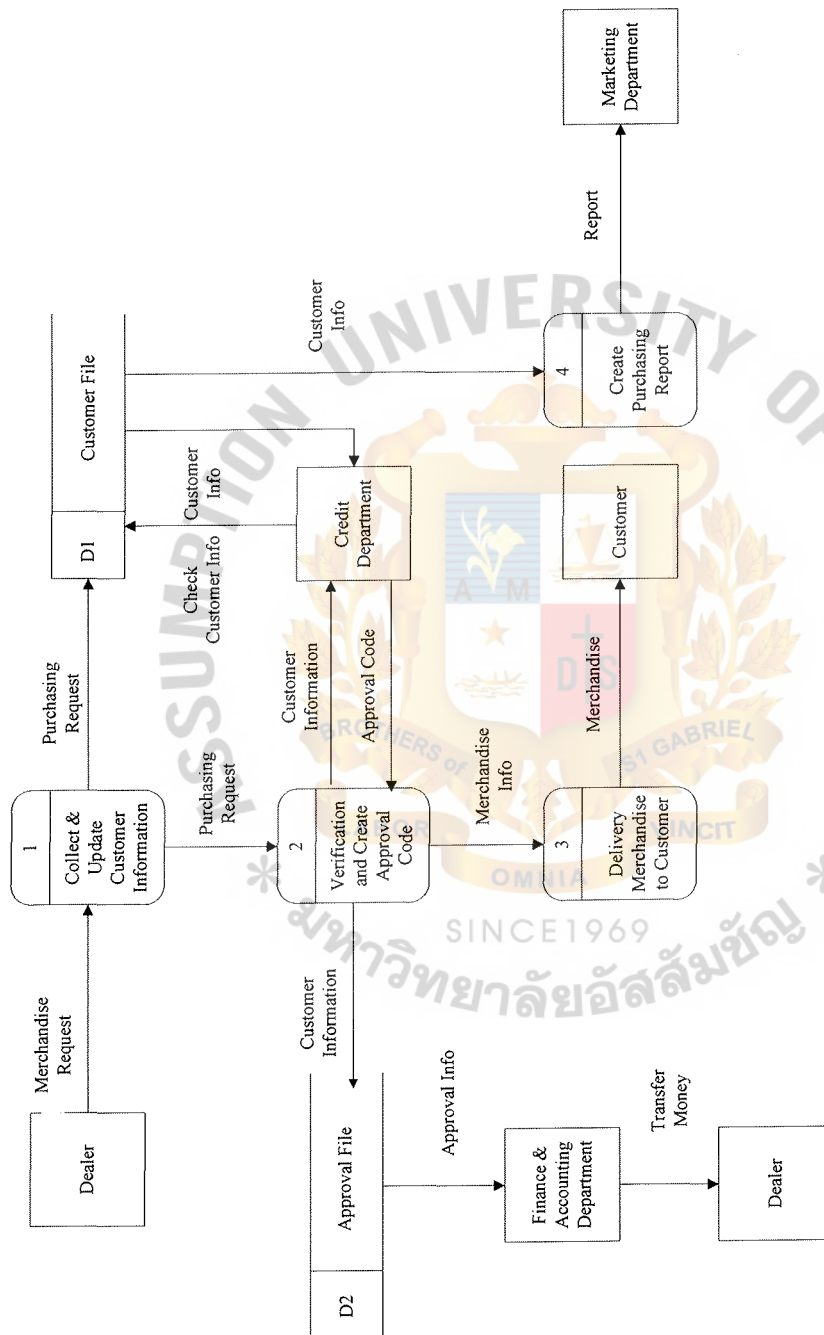


Figure 2.3. The Data Flow Diagram of the Existing System.

2.3 Current Problems and Areas for Improvement

The existing system in Credit and Operations Department has not fully use an information system to support efficient work flow and this leads to many problems for both operations and managerial problems as follows:

- (1) Spending much time in verification of each incoming customer as the information system does not fully support the process.
- (2) Takes time to receive customer's documents because the existing is based on a facsimile system so all documents must come as hard copies.
- (3) Having frequent errors in using marketing source codes due to an improper information system to match the marketing source codes with related conditions.
- (4) Losing many customers' documents due to facsimile system errors.
- (5) Report generating process is very slow and there are too many formats.
- (6) Credit and operations staff don't work efficiently because there are too many staff.
- (7) Too much office supplies are used as information system is not fully utilized.
- (8) Being unable to increase efficiency and effectiveness in managerial processes

The Online Credit Approval System or OLCAS is developed to solve all these problems. The department's database will be created to keep product information, dealer information and all purchasing information. The information will be kept in department's database and shared with related departments by using a local area network of the company. Marketing and other related departments can easily get information depending on the security level. All information will be used to create purchasing reports, dealer performance reports and customer behavior reports. Reports

will also be generated by the information from the department's database. The management team can easily access the information database using local area network to do managerial process.

2.4 Existing Computer System

Local area network (LAN) is used in Siam A&C Co., Ltd. Credit and Operation Department also connects to the network for the purpose of checking existing customer information whether the customer has a purchasing history with the company. There are 15 computers in the existing system, 10 computers are used for credit analyst is in customer verification and 5 computers are used for operations staff to key-in customer information. To receive customer's documents, the department uses 9 facsimile systems. Table 2.1 shows the existing hardware of Credit and Operations Department.

Table 2.1. Existing Hardware.

Type	Brand/Model	CPU	HDD	Ram
1.	Dell	P.166	1.2 KB	16 MB

The applications of the existing system are listed in table 2.2.

Table 2.2. Existing Software.

Type	Operating System	Application Program
1.	MS Window 95	AS 400

The computers in Credit and Operations Department are connected by LAN. The company uses software type 1 as in the Table 2.2. AS 400 is used for operations staff to

key-in customer information. Then credit analysts use AS 400 to verify customer information, generate approval codes and generate any related reports.



III. THE PROPOSED SYSTEM

3.1 System Design

OLCAS is designed for 4 subsystems according to the functions of the Credit and Operations Department. There is a Purchasing Subsystem, Customer Verification Subsystem, Purchasing Delivery Subsystem and a Purchasing Report Subsystem.

Purchasing Subsystem: In the existing process, Credit and Operations Department has to gather all required documents which are faxed from the dealer this includes purchasing contracts, customer ID, house registration, salary slips and bank statements. OLCAS database gets customer information through an online web-based process and then keeps all information on the database and shares with other departments especially the Marketing Department. Other departments can inquire information online through the Intranet website of the company.

Customer Verification Subsystem: All customer information which is submitted into the OLCAS database through Internet is kept and shared. So the credit analyst can access the database and verify the necessary information. After the necessary information is verified, customer's credit line and membership card will be generated.

Delivery Information Subsystem: Credit and Operations Department has the responsibility to confirm purchasing information and delivery customer credit verification results. Finance and Accounting Department will get the information from the OLCAS database in order to transfer money to the dealer and manage the process of sending out billing statements and membership cards. Company's dealer will have the responsibility of submitting merchandise to customer and looks after and ensures of the quality of the merchandise.

Purchasing Report Subsystem: All purchasing reports can be created by OLCAS. There are purchasing summary reports, dealer performance reports and payment advice reports. All of these reports will be created by using information collected on the OLCAS database.

For better understanding, refer to decomposition diagram in Figure 3.1, Context Diagram of proposed system in Figure 3.2, and Data Flow Diagram in Figure 3.3 to Figure 3.5.



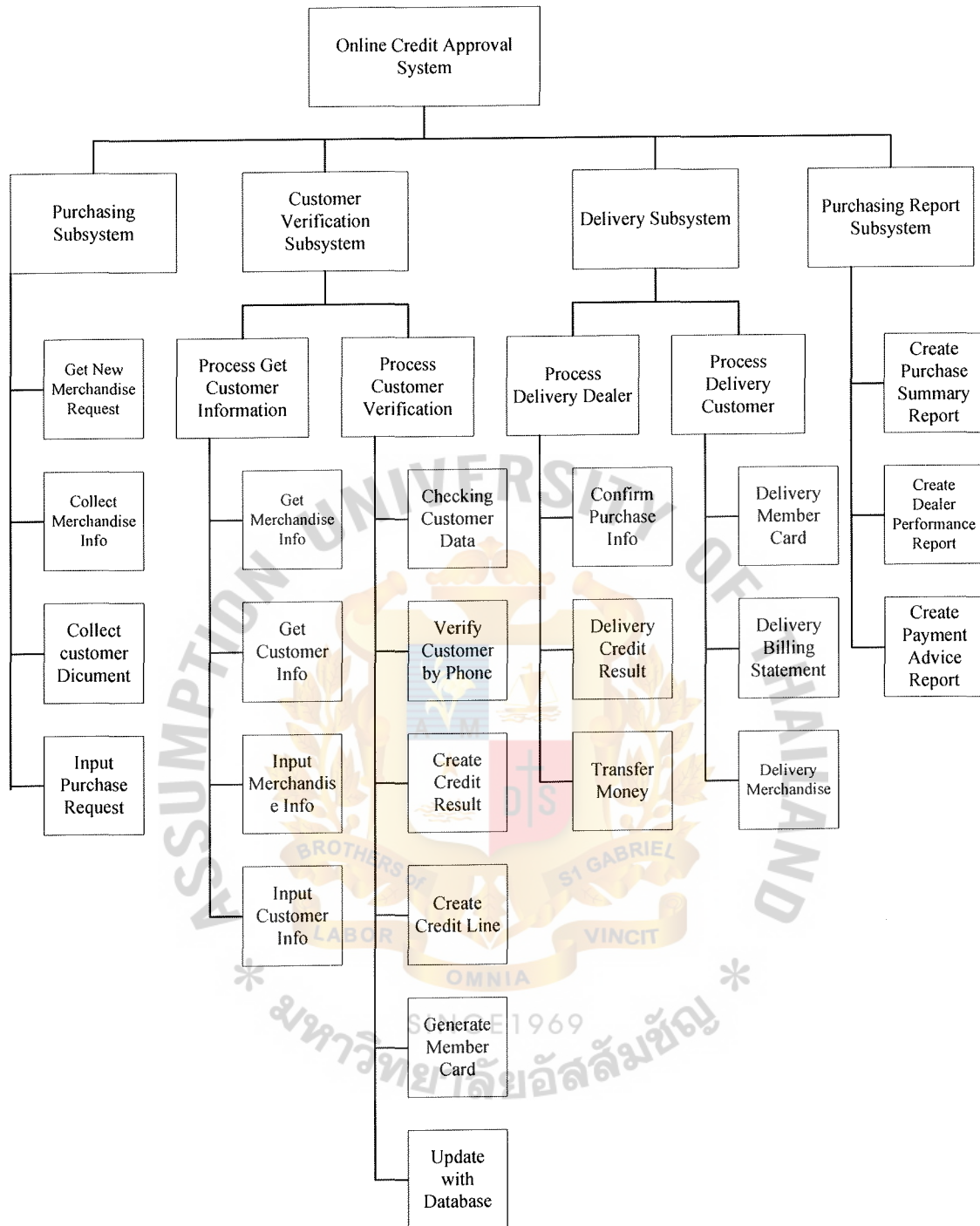


Figure 3.1. Decomposition Diagram of Online Credit Approval System.

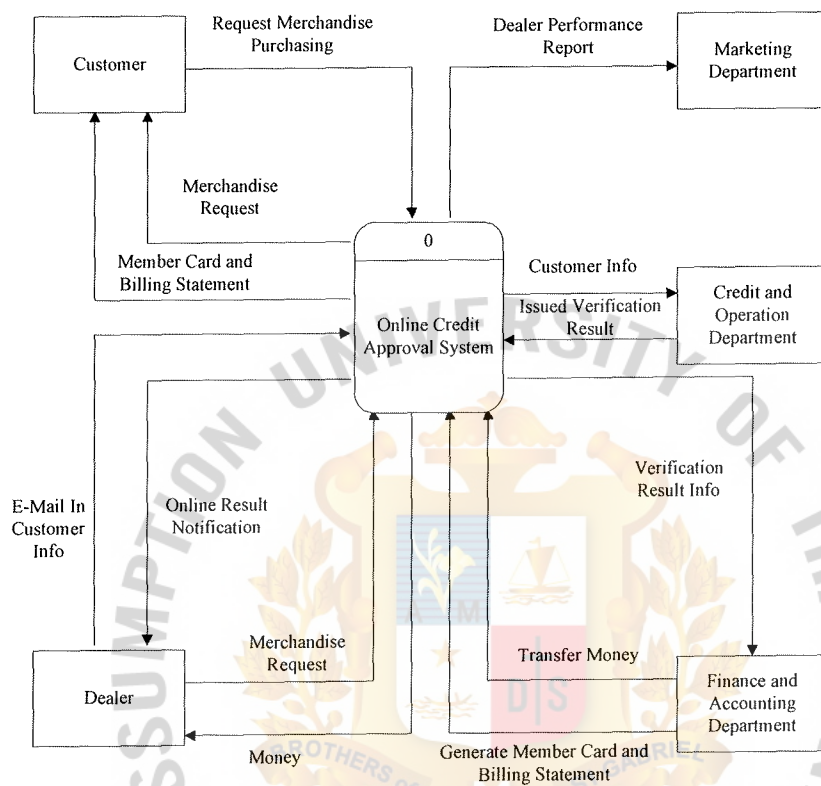


Figure 3.2. Context Diagram of Online Credit Approval System.

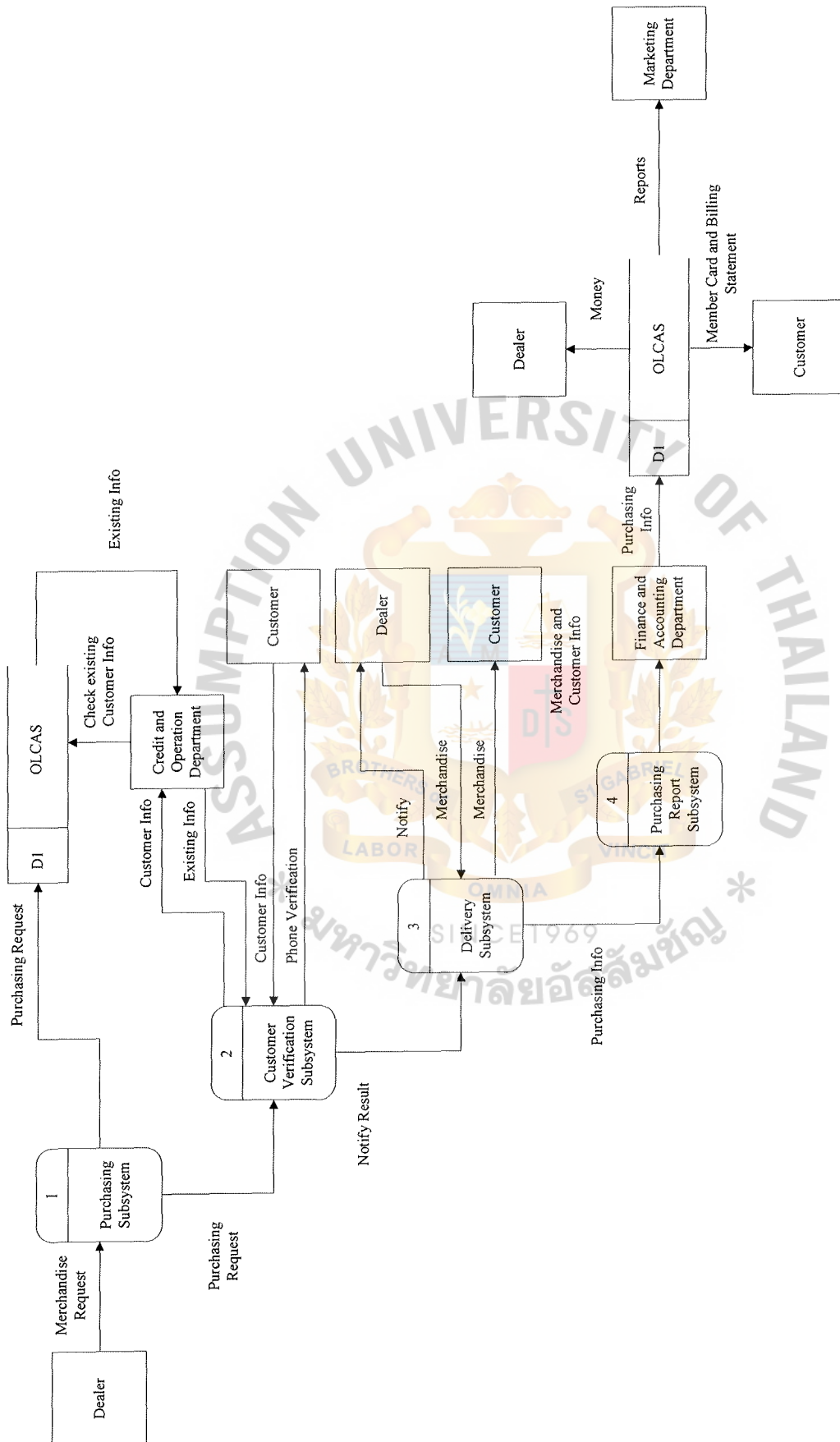


Figure 3.3. Data Flow Diagram of Online Credit Approval System- Level 1.

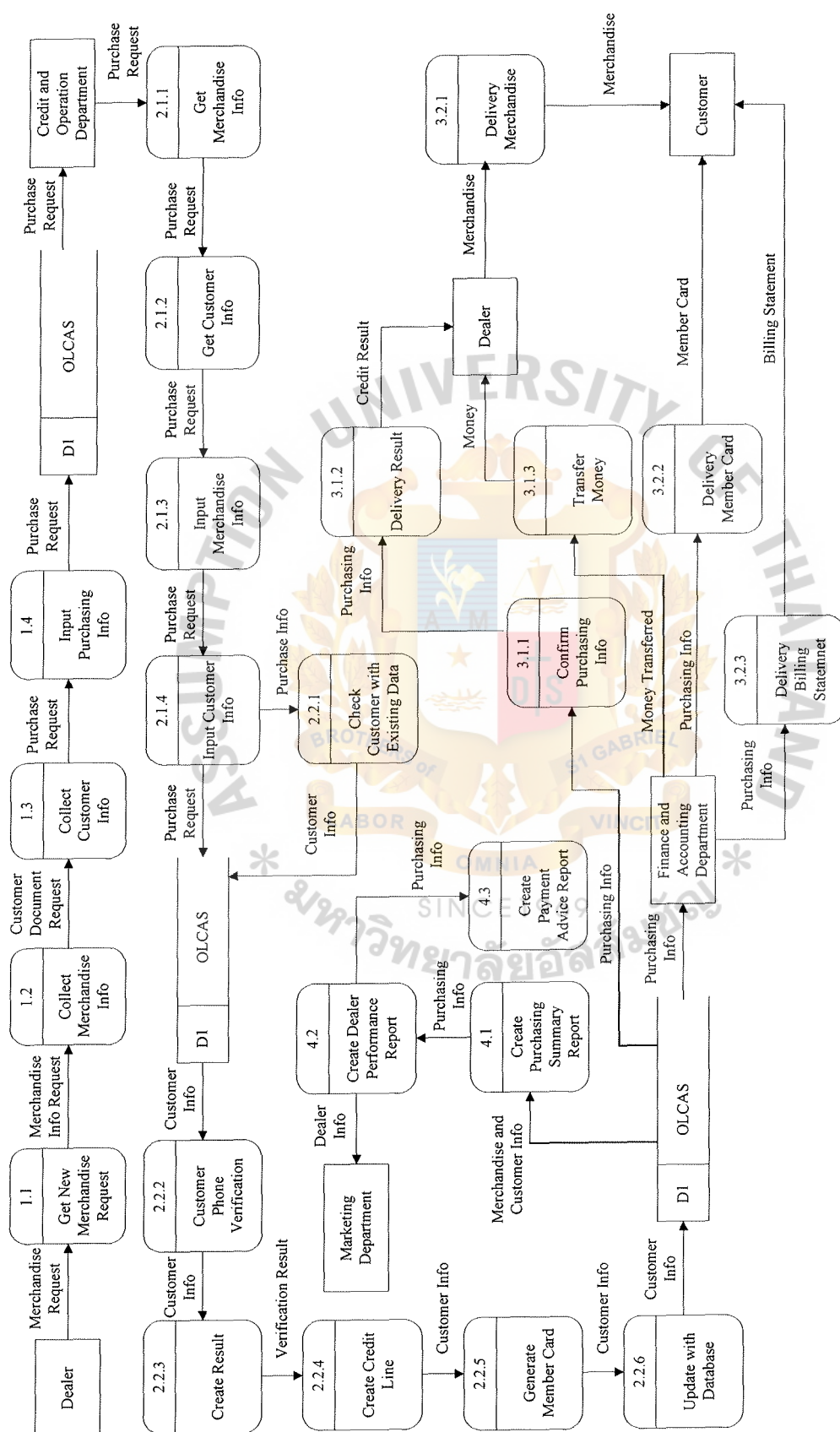


Figure 3.5. Data Flow Diagram of Online Credit Approval System- Level 3.

Input Design

Input design is an important goal for capturing and getting the data into a specific format suitable for the information system. For OLCAS, we design all main input screens from the context data flow diagrams. After reviewing data flow diagrams, we find the input requirements as shown in the following Table 3.1. Input Requirements.

Table 3.1. Input Requirements.

Information	Attributes
Customer	CustID
	CustName
	CustHouseAddress
	CustHousePhone
	CustHouseFax
	CustOfficeAddress
	CustOfficePhone
	CustOfficeFax
	CustMobile
	CustContractNumber
Merchandise	MercID
	MercType
	MercModel
	MercPrice
	SerialNumber
Contract	ContractID
	ContractPeriod
	ContractAmount
	ContractHistory
PromotionCode	ProID
	ProPeriod
	ProInterest
	ProProduct
VerificationInfo	ApprovalID
	CustID
	ContractID
	MerchID
	ProId
	DealerID
	ApprovalAmount
	ApprovalTerm

Table 3.1. Input Requirements (Continued).

Information	Attributes
DealerInfo	DealerID
	DealerAddress
	DealerPhone
	DealerFax
	DealerCategory
PurchasingInfo	PurchasingID
	PurchasingDate
	CustID
	ContractID
	MerchID
	DealerID
	ProID
	PaidDate

From the input requirements in Table 3.1, we can conclude the main input screen will be as follows Table 3.2 and Input Screen is shown in Appendix A.

Table 3.2. Main Input Screen.

Main Input Screen
1. Login Screen
2. Main Menu Screen
3. New Application Screen
4. Application Status Screen
5. Dealer Information Screen

Output Design

From the Data Flow Diagram in the previous section, we can summarize the output requirements as in the following Table 3.3.

Table 3.3. Output Requirements.

Output Requirement
1. Purchasing Summary Report
2. Dealer Performance Report
3. Payment Advice Report

System output can be produced in the form of documents and on the screen as well. The system output is shown in Appendix A.

3.2 Hardware and Software Requirement

Hardware

The designing for computer network of OLCAS is as following:

- (1) Internet Web Server Computer 1 unit
- (2) Personal Computers 12 units
- (3) Laser Printers 3 units
- (4) Modems 6 units
- (5) UPSs 6 units

Online Credit Approval System or OLCAS is a web based application. We require 1 computer to be the internet web server and to retrieve all incoming attachments. Twelve PCs, 7 of which will be in Credit and Operation Department, the other 5 will be with 5 Dealers. Three laser printers are for Credit and Operations Department. Five UPSs and 5 modems will be used by Dealers. Another modem will be used in Credit and Operations Department with internet web server. Table 3.4 Hardware specification

shows the Hardware Specification for OLCAS. Network Configuration is shown in Figure 3.6.

Table 3.4. Hardware Specification.

Type	Hardware	Specification
Internet Web Server Computer	CPU-Dual Processor Cache Memory Hard disk CD-R, RW Drive Network Adapter Floppy Drive Display Adapter Display Screen Keyboard Mouse	Intel Pentium IV 2.4 GHz 2 MB 640 MB 100MHz SDRAM 160 GB Storage 12x8x32 Integrated 10/100/1000 ethernet 1.44 MB SVGA Card 15" Monitor USB Internet Keyboard (104-key) Internet Scroll Mouse
Personal Computer	CPU Memory Hard Disk CD-Rom Drive Floppy Drive Network Adapter Display Adapter Display Screen Keyboard Mouse	Intel Pentium Processor IV 1.8 GHz 256MB 100MHz SDARM 60GB UltraDMA HDD (5,400 rpm) 52x CD-ROM Drive 1.44MB diskette drive 10/100 Ethernet NIC SVGA Card 15" Monitor USB Internet Keyboard (104-key) Internet Scroll Mouse
Laser Printers	HP Laser Jet 2100	
Modems	US Robotics 56K	
UPSs	APC Back-UPS	APC Back-UPS AVR 800

Software

Specification for OLCAS will be as following Table 3.5.

Table 3.5. Software Specification.

Type	Software	Specification
Internet Web Server Computer	Operating System Internet Web Server	Microsoft Windows 2000 Server Microsoft Internet Information System
	DBMS	Microsoft SQL Server 2000
Personal Computer	Operating System	Microsoft Windows XP Pro
	Application Software Web Browser	Microsoft Office 2002 Internet Explorer 6.0
Development Software	Microsoft Visual InterDev Microsoft Frontpage 2000	



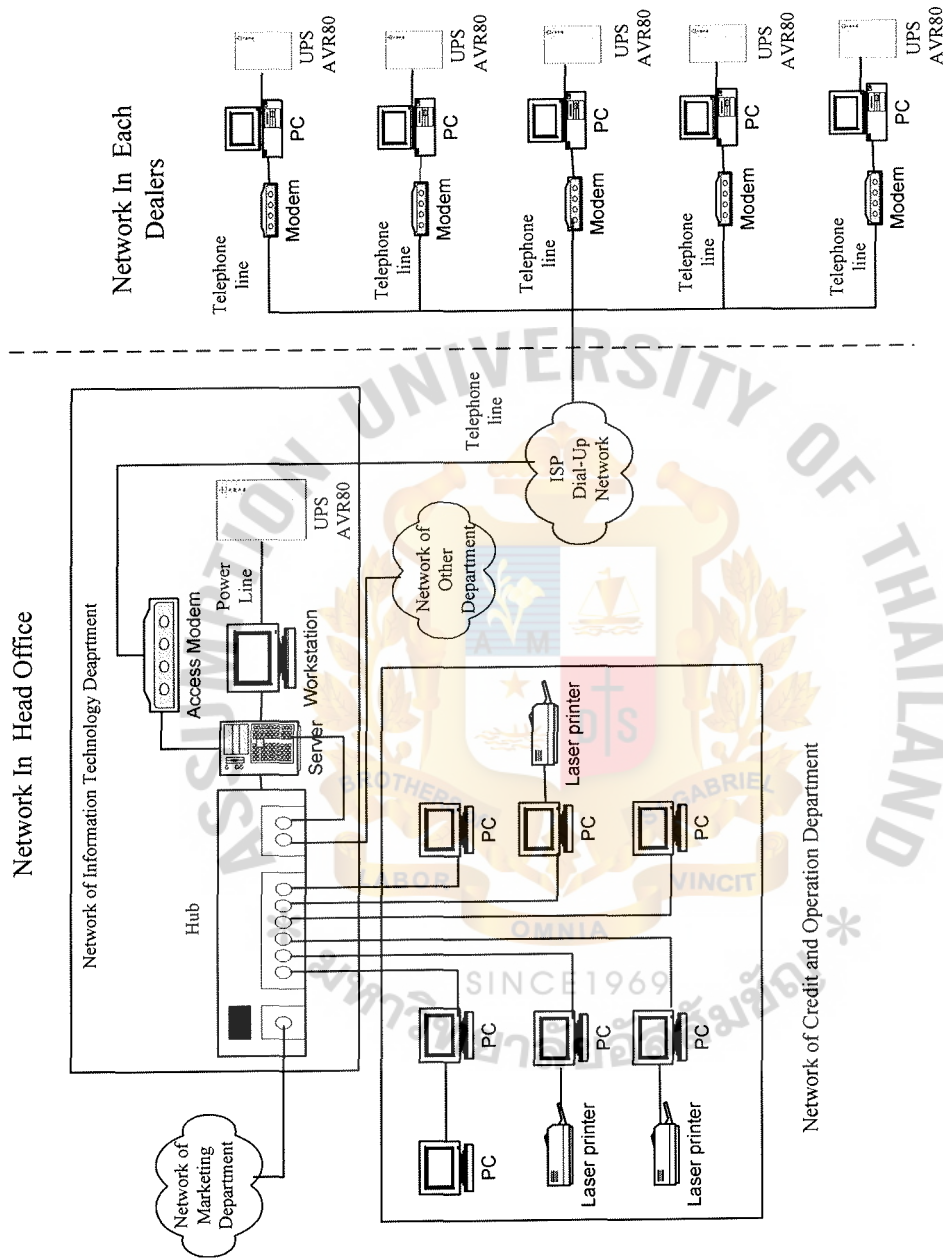


Figure 3.6. Network Configuration of Proposed System.

3.3 Security and Control

User's Login and Password

OLCAS is the new system which contains important information of customers which will be used by just 3 departments they are Credit and Operations Department, Marketing Department and Finance and Accounting Department. Other departments may use some information in some part of OLCAS. Security is important for OLCAS to protect loss of information and unauthorized users. Each user will be assigned to different levels of program usage.

Backup is planned to be done automatically every day through a tape at 11.00 PM. Every Monday backup tape is overwritten on the following Monday's backup tape. Tuesday backup tape is overwritten on the following Tuesday's back up tape and so on. Month-end and Year-end backup tapes are not overwritten but will be kept in a secured computer room.

All servers computer hardware will be in the computer room. Only authorized persons are allowed to enter the computer room. They also require security cards and passwords to enter the computer room.

3.4 Cost/Benefit Analysis

(1) Cost of Manual System

Table 3.6. Manual System Cost Analysis, Baht.

Cost Items		Years				
		1	2	3	4	5
Fixed Cost						
Fax Machine	10 units @ 8,000	80,000.00	88,000.00	96,800.00	106,480.00	117,128.00
Operating Cost						
Salary Cost						
Credit Manager	1 @ 30,000	360,000.00	396,000.00	435,600.00	479,160.00	527,076.00
Credit Supervisor	1 @ 20,000	240,000.00	264,000.00	290,400.00	319,440.00	351,384.00
Credit Staff	13 @ 10,000	1,560,000.00	1,716,000.00	1,887,600.00	2,076,360.00	2,283,996.00
Office Supplies & Miscellaneous Cost:						
Stationary	Per Annual	80,000.00	88,000.00	96,800.00	106,480.00	117,128.00
Paper	Per Annual	50,000.00	55,000.00	60,500.00	66,550.00	73,205.00
Utility	Per Annual	70,000.00	77,000.00	84,700.00	93,170.00	102,487.00
Miscellaneous	Per Annual	70,000.00	77,000.00	84,700.00	93,170.00	102,487.00
Total Manual Cost System		2,510,000.00	2,761,000.00	3,037,100.00	3,340,810.00	3,674,891.00

Table 3.7. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	2,510,000.00	2,510,000.00
2	2,761,000.00	5,271,000.00
3	3,037,100.00	8,308,100.00
4	3,340,810.00	11,648,910.00
5	3,674,891.00	15,323,801.00
Total	15,323,801.00	-

(2) Cost of Computerized System

Table 3.8. Computerized System Cost Analysis, Baht.

Cost Items		Years				
		1	2	3	4	5
Fixed Cost						
Hardware Cost						
Server Cost	1 unit @ 57,250	11,450.00	11,450.00	11,450.00	11,450.00	11,450.00
Client Cost	12 units @ 31,750	76,200.00	76,200.00	76,200.00	76,200.00	76,200.00
Printer	3 units @ 15,000	9,000.00	9,000.00	9,000.00	9,000.00	9,000.00
Hub	1 unit @ 1,500	300.00	300.00	300.00	300.00	300.00
Digital Modem	6 units @ 4,000	4,800.00	4,800.00	4,800.00	4,800.00	4,800.00
Maintenance Cost						
Software Cost						
Windows2000 Server	1 unit @ 20,000	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
Windows XP	12 units @ 15,000	36,000.00	36,000.00	36,000.00	36,000.00	36,000.00
MS Office XP	12 units @ 18,000	43,200.00	43,200.00	43,200.00	43,200.00	43,200.00
Implementation Cost:						
Advance Training Cost		400,000.00	-	-	-	-
Basic Training Cost		400,000.00	-	-	-	-
Development Cost		600,000.00	-	-	-	-
Total Fixed Cost		1,584,950.00	184,950.00	184,950.00	184,950.00	184,950.00
Operating Cost						
People-Ware Cost:						
Credit Manager	1 person @ 30,000	360,000.00	396,000.00	435,600.00	479,160.00	527,076.00
Credit Supervisor	1 person @ 20,000	240,000.00	264,000.00	290,400.00	319,440.00	351,384.00
Credit Staff	8 persons @ 10,000	960,000.00	1,056,000.00	1,161,600.00	1,277,760.00	1,405,536.00
Office Supplies & Miscellaneous Cost:						
Stationary	Per Annual	40,000.00	44,000.00	48,400.00	53,240.00	58,564.00
Paper	Per Annual	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Utility	Per Annual	40,000.00	44,000.00	48,400.00	53,240.00	58,564.00
Miscellaneous	Per Annual	35,000.00	38,500.00	42,350.00	46,585.00	51,243.50
Web Hosting	Per Annual	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
ISDN	Per Annual	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Total Operating Cost		1,730,000.00	1,903,000.00	2,093,300.00	2,302,630.00	2,532,893.00
Total Computerized System Cost		3,314,950.00	2,087,950.00	2,278,250.00	2,487,580.00	2,717,843.00

Table 3.9. Five Years Accumulated Computerized System, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	3,314,950.00	3,314,950.00
2	2,087,950.00	5,402,900.00
3	2,278,250.00	7,681,150.00
4	2,487,580.00	10,168,730.00
5	2,717,843.00	12,886,573.00
Total	12,886,573.00	-

- (3) The Comparison of the System Cost between the Computerized System and the Manual System.

Table 3.10. The Comparison of the System Cost, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	2,510,000.00	3,314,950.00
2	5,271,000.00	5,402,900.00
3	8,308,100.00	7,681,150.00
4	11,648,910.00	10,168,730.00
5	15,323,801.00	12,886,573.00

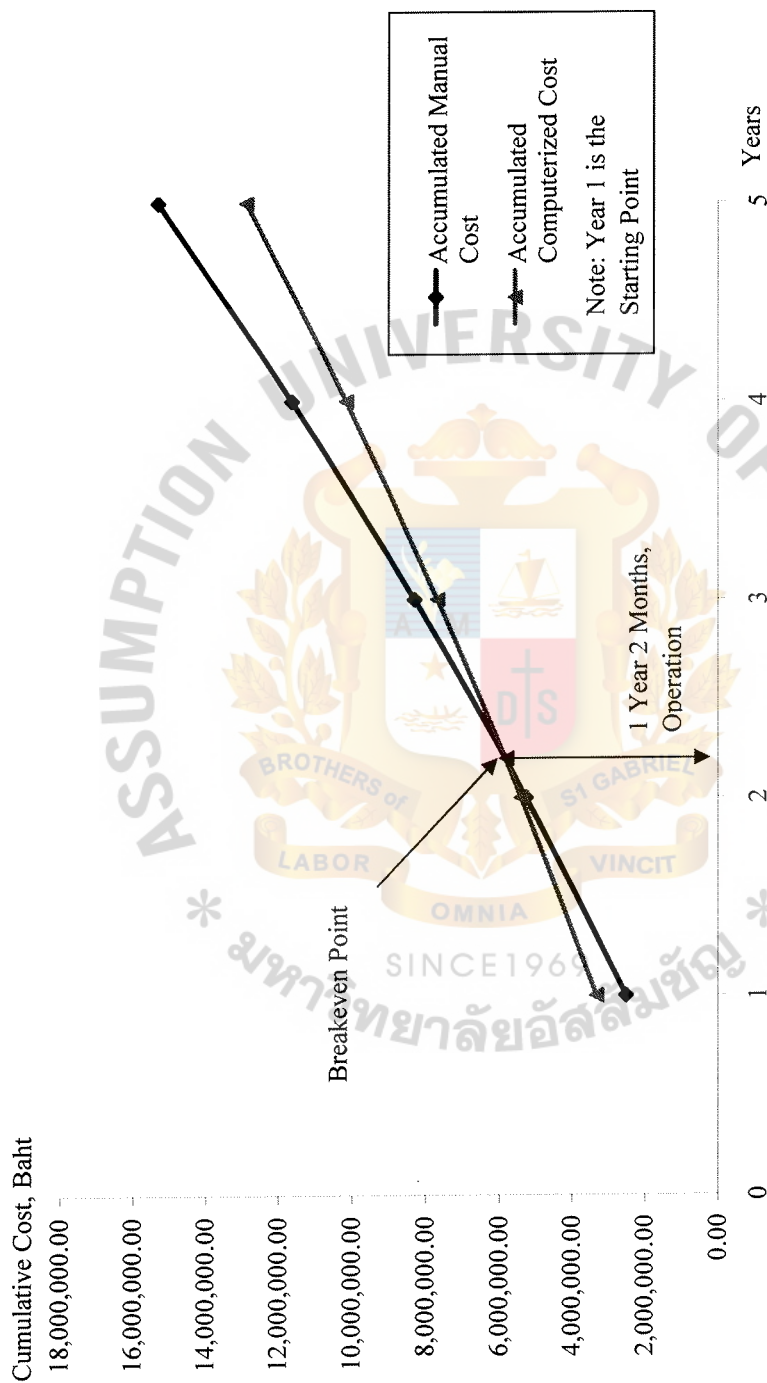


Figure 3.7. Cost Comparison between Manual & Proposed System.

Table 3.11. Payback Analysis for the Proposed System, Baht.

Cost Items	Years				
	0	1	2	3	4
Development Cost	-1,584,950.00	0.00	0.00	0.00	0.00
Operation & Maintenance Cost	0.00	-1,730,000.00	-1,816,500.00	-1,907,325.00	-2,002,691.25
Discount factors for 12%	1.00	0.89	0.80	0.71	0.64
Time-adjusted costs over lifetime (adjusted to present value)	-1,584,950.00	-1,544,642.86	-1,448,102.68	-1,357,596.26	-1,272,746.49
Cumulative time adjusted costs over lifetime	-1,584,950.00	-3,129,592.86	-4,577,695.54	-5,935,291.80	-7,208,038.29
Benefit derived from operation of new system	0.00	3,500,000.00	3,850,000.00	4,235,000.00	4,658,500.00
Discount factors for 12%	1.00	0.89	0.80	0.71	0.64
Time-adjusted benefit over lifetime (adjusted to present value)	0.00	3,125,000.00	3,069,196.43	3,014,389.35	2,960,560.97
Cumulative time adjusted benefit over lifetime	0.00	3,125,000.00	6,194,196.43	9,208,585.78	12,169,146.75
Cumulative time adjusted costs over lifetime + benefit (baht)	-1,584,950.00	-4,592.86	1,616,500.89	3,273,293.98	4,961,108.45
					6,675,602.42

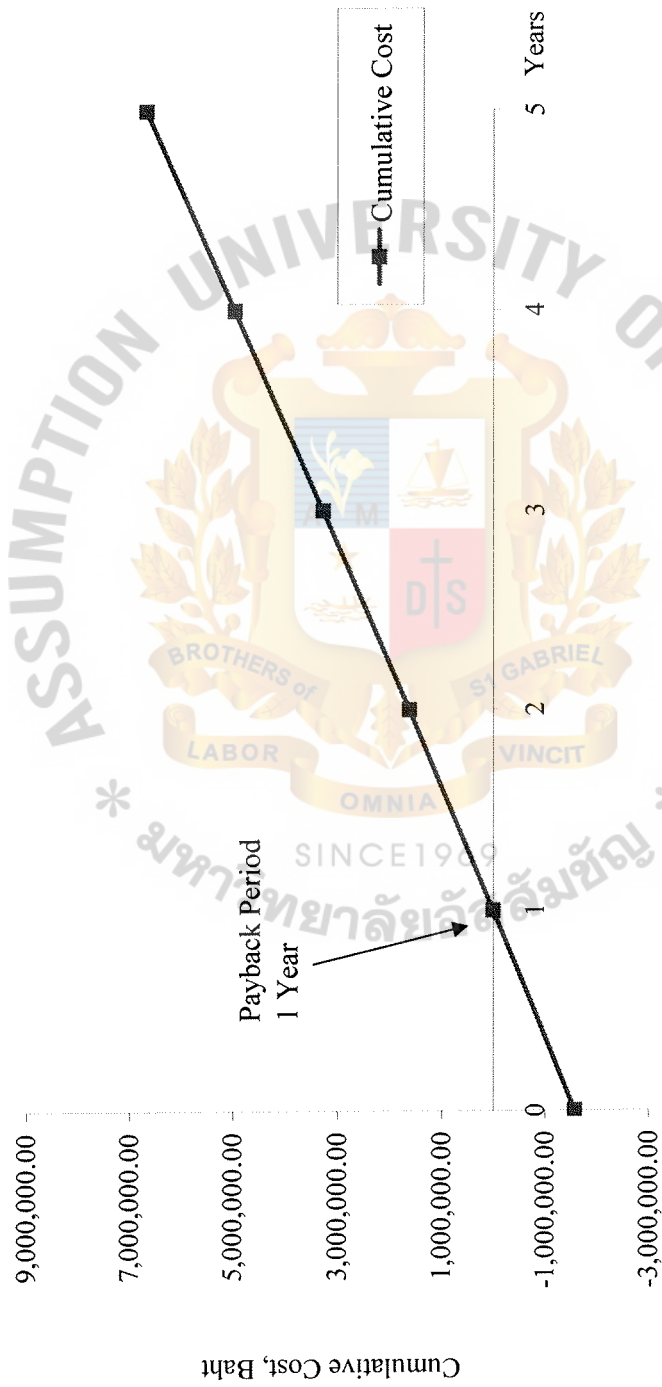


Figure 3.8. Payback Analysis.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

Implementation of OLCAS will be divided into 5 parts as follows:

- (1) Coding
- (2) Testing
- (3) Hardware Installation
- (4) Software Installation
- (5) Conversion

The implementation schedule is shown in Figure 4.1. Gantt Chart for Project Implementation.

Testing

After finishing the program coding, testing will be started. System testing is an expensive and critical process that can take as much 50 percents of the budget for the program development. The common view of testing held by users is that it is performed to prove that there are no errors in the program. Test case, a set of data that the system will process as normal input, will be designed with the intent to find errors in the way system will process it. 2 types of testing will be implemented.

Unit Testing

Unit testing is a test whereby all modules that have been coded and stub tested are tested as an integrated unit. It ensures that the application programs work properly when tested in isolation from others.

System Testing

System testing is a test that ensures that application programs written in isolation work properly when they are integrated into the total system. It also tests to find

discrepancies between the system and its original objective, current specifications and system documentation. System testing must also verify that file size are adequate and that indices have been built properly.

4.2 Conversion

There are many files in the existing system to collect and convert for the new computerized system. All these files will be backed up to prevent any unexpected errors before the procedure of data conversion starts. Parallel conversion is selected for data conversion. Credit and Operations Department has to operate on both the existing system and the new system to ensure that all problems in the new system are solved before the old system is discarded. Both systems will be operated for 1 month to make sure that there is nothing wrong with the new system. This schedule can be changed if there are errors on the data conversion.

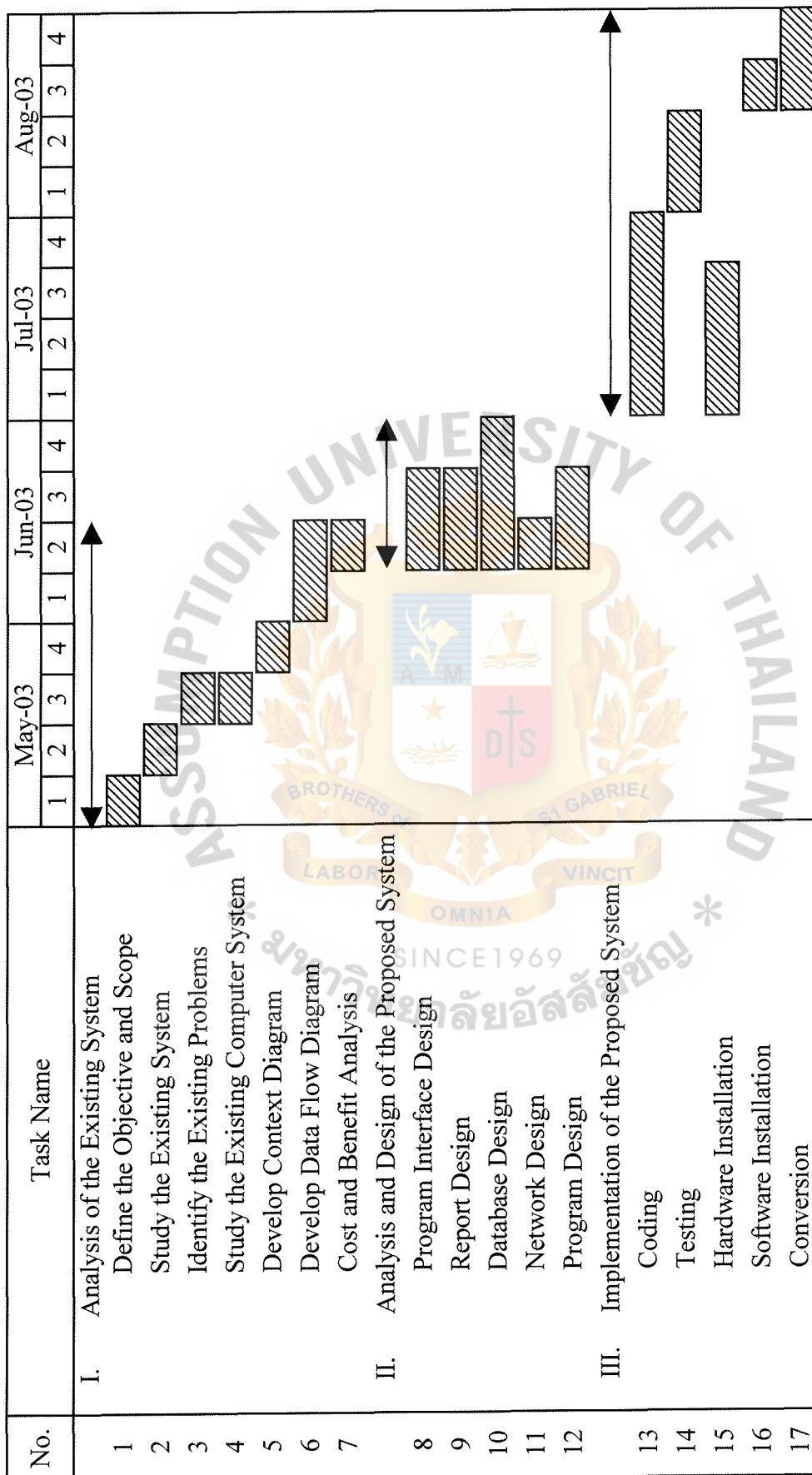


Figure 4.1. Gantt Chart for Project Implementation of Online Credit Approval System.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The credit approval process in the existing system of Siam A&C Co., Ltd. is not fully computerized which leads to many problems and cannot support the growing market of leasing business. Online Credit Approval System or OLCAS is designed to solve the operational and management problems. OLCAS is a computerized system which can be used by other departments, especially for sharing customer data to the Marketing Department.

Internet and Intranet Technology will be used for the OLCAS. Customer information can be submitted through Internet and shared using the Intranet website. OLCAS is also designed with good security to prevent unauthorized persons and to protect confidential information. Reports can be easily produced from the OLCAS database.

The proposed cost is a large amount of investment. When compared to the existing system, the cost of new computerized system will reduce while the cost of the existing system is higher in the next couple of years.

OLCAS is designed not only to solve the problems of the existing system and develop the workflow but will also support the growing market of the leasing business. In only 6 months, a new computerized Online Credit Approval System or OLCAS can be developed for Credit and Operations Department. Moreover, the proposed system can help to increase work flow standards and can lead to data accuracy and efficient work.

Table 5.1 shows the time performance on each process of the proposed system compared with the existing system. It shows that each process of the proposed system

takes less time than each process of the existing system which has to operate many work steps manually. Thus, it can be concluded that the proposed system is more efficient and effective than the existing system.

Table 5.1. The Degree of Achievement of the Proposed System.

Process	Existing System	Proposed System
Application-In Process	1 hr.	10 mins.
Data Entry Process	1 hr.	10 mins.
Verification Process	3 hrs.	1 hr. 30 mins.
Generate Credit Result Process	3 hrs.	10 mins.

The Degree of Achievement of Proposed System is divided into 4 processes as seen in the above table. Application-In process and Data Entry process takes lesser time because a web-based application is used for capture and transfer of application data. Verification process takes 1 hour 30 minutes because a web-based application and integrated database is used for inquiry with the existing data base. Generating Credit Result process takes just 10 minutes because of the web-based application being used for informing credit results.

5.2 Recommendations

OLCAS is a web-based application which will be used by the Credit and Operations Department closely with the Marketing Department. To effective and efficient work flow, web-based applications for the Marketing Department should be developed with the same technology and the marketing information should be shared with other departments including Credit and Operations Department. This new application for the Marketing Department will help the company to increase customer satisfaction and productivity to support the growing market of hire purchasing. The users of the web based application is the whole company are recommended to take the

advantage of the Intranet technology, which will lead to more effective and efficiency in working.





APPENDIX A

INPUT AND OUTPUT SCREEN

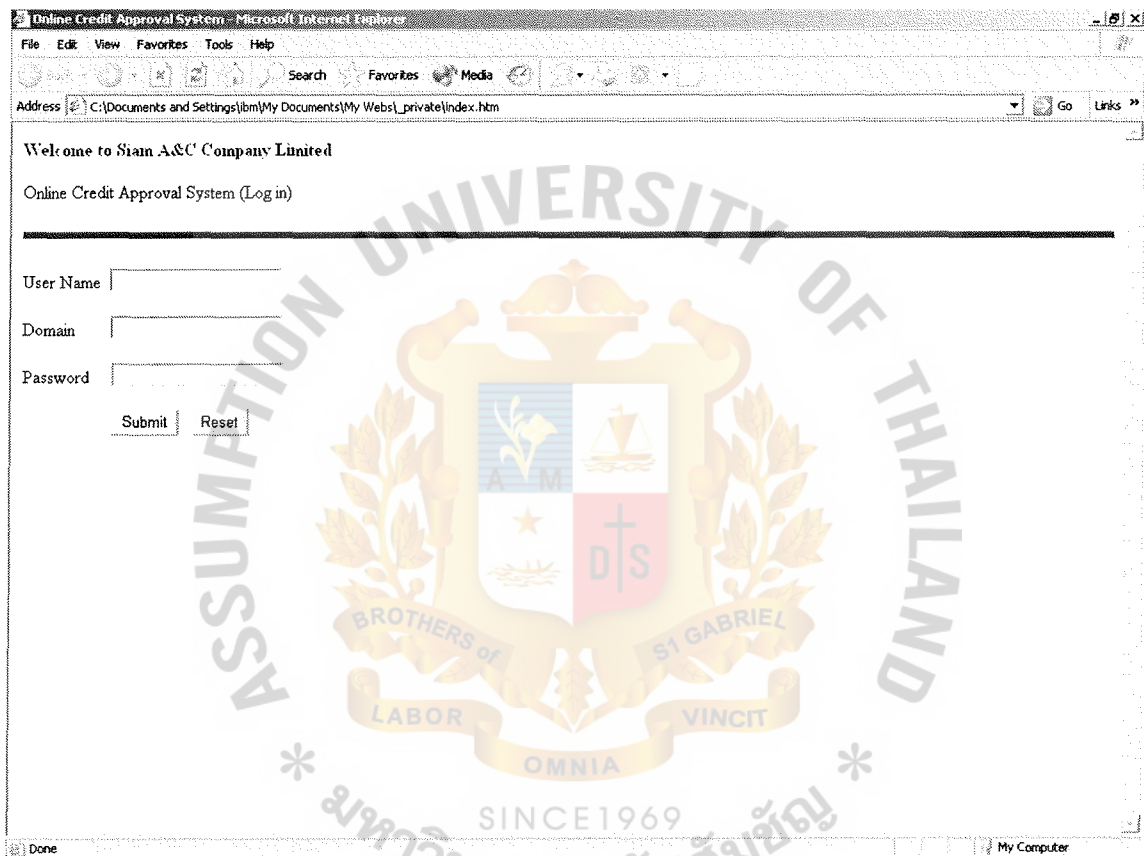


Figure A.1. Login Screen.

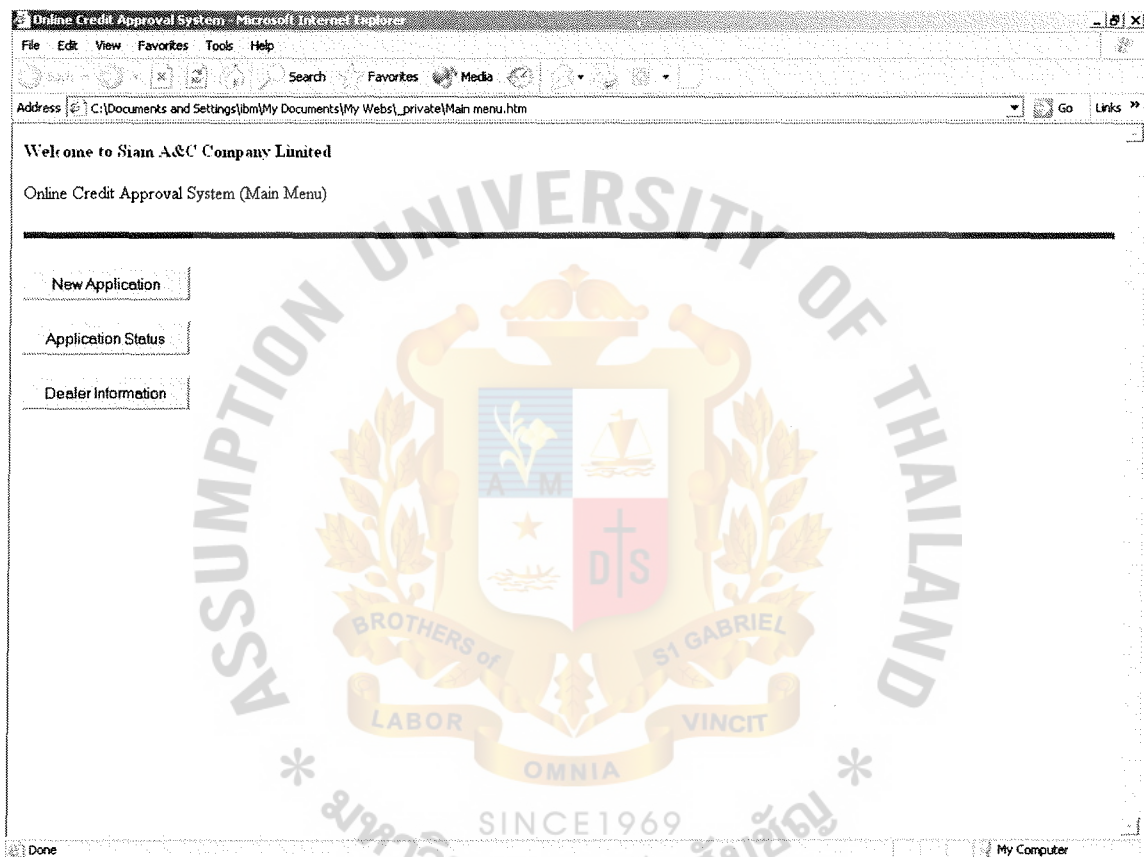


Figure A.2. Main Menu Screen.

1 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address Go Links »

Welcome to Siam A&C Company Limited

Online Credit Approval System (Application Form)

1 ประวัติส่วนตัวผู้สมัคร (ผู้สมัครต้องมิอายุ 22 ปีขึ้นไป)

ชื่อ-นามสกุล * นาม

ชื่อภาษาอังกฤษตาม Mr.

หนังสือเดินทาง *

วัน/เดือน/ปีเกิด * เลขที่บัตรประชาชน/หนังสือเดินทาง *

ที่อยู่ปัจจุบัน

เลขที่ * หมู่ที่

ซอย หมู่บ้าน/อพาร์ทเมนต์

ถนน * แขวง

เขต * จังหวัด *

รหัสไปรษณีย์ * โทรศัพท์ *

โทรศัพท์มือถือ/เฟลเจอร์ อีเมล *

บ้านที่อยู่อาศัย * อาศัยมานาน ปี

ที่อยู่อื่น

เลขที่ หมู่ที่

ซอย หมู่บ้าน/อพาร์ทเมนต์

ถนน แขวง

เขต จังหวัด

รหัสไปรษณีย์ โทรศัพท์

สถานภาพทางครอบครัว *

(โปรดระบุ)

☐ จำนวนบุตร คน ชื่อคู่สมรส

2 อาชีพรายได้ประจำ

อาชีพ * (โปรดระบุ)

ที่ปรึกษา/หัวหน้างาน *

Done My Computer

Figure A.3. New Application Screen.

1 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Search Favorites Media

Address C:\Documents and Settings\lbn\My Documents\My Project\Test.htm Go Links

2. อาชีพรายได้ประจำ

อาชีพ * อื่นๆ (โปรดระบุ)

ชื่อบริษัท/ห้างร้าน *

ที่อยู่ทำงาน เลขที่ ชั้น

อาคาร แผนก

ถนน

แขวง เขต

จังหวัด * รหัสไปรษณีย์

โทรศัพท์ เบอร์ต่อ

ประเภทกิจการ * ตำแหน่ง *

รายได้ รายได้ส่วนบุคคลต่อปี รายได้อื่นๆต่อปี

แหล่งที่มาของรายได้อื่นๆ

อายุงาน * ปี เดือน

หากอายุงานไม่ถึง 2 ปี โปรดระบุชื่อและโทรศัพท์ของที่ทำงานก่อนหน้านี้

ตำแหน่ง อายุงาน ปี

โทรศัพท์ในเบอร์ต่อ

บุคคลที่อ้างอิงได้ ชื่อ โทรศัพท์

3. สถานที่ส่งใบเรียกเก็บเงินและบัตร

สถานที่ส่งใบเรียกเก็บเงิน *

สถานที่ส่งบัตร *

4. บัญชีธนาคาร/สถาบันการเงิน

ชื่อบัญชี *

บัญชีเลขที่ *

ธนาคาร *

ตัวอย่าง (0123456789)

Done My Computer

Figure A.4. New Application Screen (Continued).

1 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address Go Links

ตำแหน่ง อาญาน บ

โทรศัพท์เบอร์ต่อ

บุคคลที่อ้างอิงได้ ชื่อ โทรศัพท์

3. สถานที่ส่งใบเรียกเก็บเงินและบัตร

สถานที่ส่งใบเรียกเก็บเงิน สถานที่ส่งบัตร

4. บัญชีธนาคาร/สถาบันการเงิน

ชื่อบัญชี *

บัญชีเลขที่ * ตัวอย่าง (0123456789)

ธนาคาร *

สาขา *

ชื่อบัญชี

บัญชีเลขที่

ธนาคาร

สาขา

เปิดมานาน ปี

เปิดมานาน ปี

5. บัตรเครดิตที่ถืออยู่

☐ ลูกค้านี้แบงก์ หมายเลขบัตร

☐ ลูกค้าอื่น ธนาคาร หมายเลขบัตร

ธนาคาร หมายเลขบัตร

Submit Cancel

Done My Computer

Figure A.5. New Application Screen (Continued).

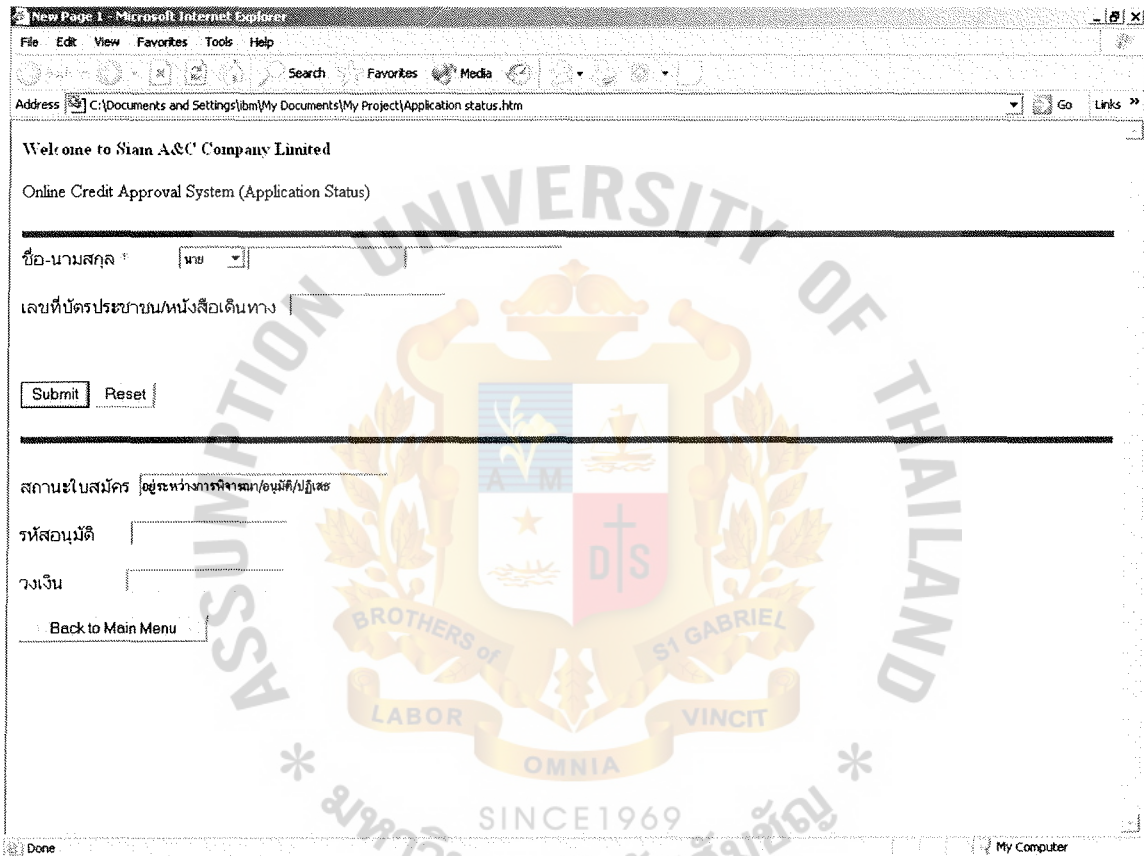


Figure A.6. Application Status Screen.

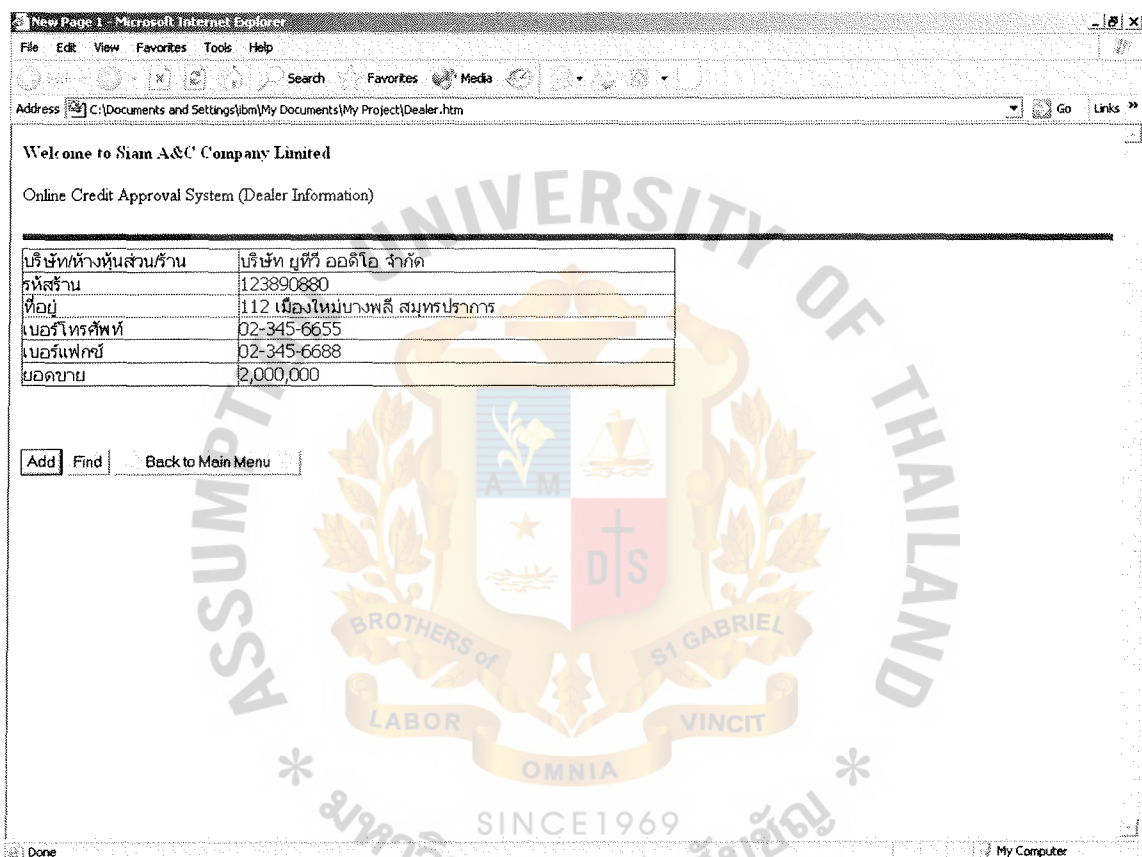


Figure A.7. Dealer Information Screen.



APPENDIX B

DATA DICTIONARY

DATA DICTIONARY

A data dictionary is a document that supports data flow diagrams. It contains all terms and their definition for data flows and data stores related to a specific system. The purpose of a data dictionary is to define the contents of the data flows and data stores with the exception of the procedures that are defined separately through the use of process descriptions. It also contains definitions for data and control items on structure charts.

A data dictionary is necessary to provide consistency. It is of primary importance in keeping a structured analysis project on the right track. In addition, it has a long-term value because it is the basis for what eventually turns out to be system's database. It provides information on data flows, other inputs, outputs, printed reports, data stores and so on.

The symbols used in constructing data dictionary are:

=	means	EQUIVALENT TO
+	means	AND
{ }	means	REPEATION data elements
[]	means	EITHER one data element OR another
**	means	COMMENT
@	means	IDENTIFIER (key field) for a store
!	means	SEPERATES alternative choices in the { } construct
()	means	OPTIONAL data element

MercDerivative	=	*Derivative of leased merchandise*
MercType	=	*Type of leased merchandise* [Electrical Appliances / Computer / Furniture / Car Accessories / Others]
MercId	=	*Identification of leased merchandise, serial number*
MercModel	=	*Model of leased merchandise*
MercPrice	=	*Price of leased merchandise*
CustAddress	=	*Customer Address* *Street + City + Province + Zip Code*
CustFax	=	*Fax number of customer* *Area Code + Fax Number*
CustId	=	*Customer Identification*
CustName	=	*Customer Name* *Customer Name + Customer Surname*
CustPhone	=	*Customer Phone* *Area Code + Phone Number*
CustCompany	=	*Customer Company*
CustBusType	=	*Business Type of customer* [Bank / Finance / Consulting / Computer / Real Estate / Others]
CustOffice	=	*Customer Office Address* *Street + City + Province + Zip Code*
CustOfficePhone	=	*Customer Office Phone* *Area Code + Phone Number*
DealerAddress	=	*Dealer Address* *Street + City + Province + Zip Code*

DealerBusType = *Business Type of dealer* [Electrical Appliances /
Computer / Furniture / Car Accessories / Others]

DealerPhone = *Dealer Phone*
Area Code + Phone number

DealerFax = *Dealer Fax Number*
Area Code + Fax number

DealerId = *Dealer Identification*

DealerName = *Dealer Name*

AppCode = *Identification Number for approval issued*

AppAmount = *The amount of approval*
unit:Baht

AppDate = *The date that issued approval code*

PaidDate = *The due date for paying merchandise to dealer*



APPENDIX C

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Process No.:1.1

Process Name : Get New Merchandise Request

Description : Get request from Dealer for new merchandise purchasing

Input : E-mail request from Dealer

Output : Dealer request for new merchandise purchasing

Process : 1. Get dealer request for new merchandise purchasing
2. Get new merchandise request

Process No. : 1.2

Process Name : Collect Merchandise Information

Description : Collect new merchandise purchasing information that receives requests from dealer

Input : Merchandise information request for new purchasing

Output : Merchandise detail information

Process : 1. Get merchandise information
2. Collect merchandise information

Process No. : 1.3

Process Name : Collect Customer Info

Description : Collect customer information that receives request from dealer

Input : Customer information request for new purchasing

Output : Customer details information

Process : 1. Get customer information for new purchasing
2. Collect customer information for new purchasing

Process No. : 1.4

Process Name : Input Purchasing Info

Description : Input purchasing information, including of merchandise information and customer information, and update into OLCAS

Input : Merchandise information and customer information from dealer

Output : Updated purchasing information in OLCAS

Process : 1. Receive purchasing request
2. Updated purchasing request into OLCAS

Process No. : 2.1.1

Process Name : Get Merchandise Info

Description : Credit and Operation Department get purchase request
which is merchandise information

Input : Purchase request which is merchandise information

Output : Merchandise details

Process : 1. Receive purchase information from OLCAS
2. Get merchandise details

Process No. : 2.1.2

Process Name : Get Customer Info

Description : Credit and Operation Department get purchase request
which is customer information

Input : Customer details

Output : Purchasing details

Process : 1. Receive purchase information form OLCAS
2. Get customer information

Process No. : 2.1.3

Process Name : Input Merchandise Info

Description : Input merchandise information into the system for verification process

Input : Merchandise information

Output : Merchandise details

Process : 1. Receive purchase request

2. Input merchandise information into the system

Process No. : 2.1.4

Process Name : Input Customer Info

Description : Input customer information into the system for verification process and update into OLCAS

Input : Customer information

Output : Customer details

Process : 1. Receive purchase request

2. Input customer information into the system

3. Update purchase into OLCAS

Process No. : 2.2.1

Process Name : Check Customer with Existing Data

Description : Credit authorizer verify customer information with existing database

Input : Customer information

Output : Checked customer information

Process : 1. Receive customer information

2. Check customer information with existing database
3. Send checked customer information to update with OLCAS

Process No. : 2.2.2

Process Name : Customer Phone Verification

Description : Credit authorizer call customer to verify the customer information

Output : Verification result

Process : 1. Receive customer information form OLCAS

2. Call customer to verify information
3. Generate verification result

Process No. : 2.2.3

Process Name : Create result

Description : After get verification result, the approval code will be created

Input : Verification result

Output : Approval code

Process : 1. Receive verification result
2. Create approval code

Process No. : 2.2.4

Process Name : Create Credit Line

Description : After get approval code, credit line will be generated

Input : Customer information with approval code

Output : Credit line

Process : 1. Receive approval code
2. Generate credit line

Process No. : 2.2.5

Process Name : Generate Member Card

Description : The member card will be created according to the credit line

Input : Customer information and credit line

Output : Member card database

Process : 1. Receive credit line data
2. Generate member card database

Process No. : 2.2.6

Process Name : Update with Database

Description : Get customer information, which include of approval code, credit line and member card data, and updated into OLCAS

Input : Customer information, approval code, credit line and member card data

Output : Update customer information

Process : 1. Receive customer information
2. Update customer information into OLCAS

Process No. : 3.1.1

Process Name : Confirm Purchasing Info

Description : Get purchasing information from OLCAS and confirm with dealer

Input : Purchasing information

Output : Purchasing confirmation result

Process : 1. Get purchasing information from OLCAS
2. Confirm with dealer

Process No. : 3.1.2

Process Name : Delivery result

Description : After confirmed purchasing information with dealer, the result will be send through e-mail

Input : Purchasing information and confirmation result

Output : E-mail verification result

Process : 1. Receive purchasing information and confirmation result
2. E-mail verification result to dealer

Process No. : 3.1.3
 Process Name : Transfer Money
 Description : Finance and Accounting Department get purchasing information from OLCAS, and then transfer money according to purchasing information to dealer
 Input : Purchasing information from OLCAS
 Output : Money transferred
 Process :

1. Finance and Accounting Department receive purchasing information from OLCAS
2. Finance and Accounting Department transfer money to dealer according to the purchasing information

Process No. : 3.2.1
 Process Name : Delivery Merchandise
 Description : After dealer receive credit result, the purchased merchandise will be send to customer
 Input : Credit result
 Output : Merchandise
 Process :

1. Credit result will be send through E-mail to dealer
2. Dealer send purchased merchandise to customer

Process No. : 3.2.2

Process Name : Delivery Member Card

Description : After submitted the merchandise, Finance and Accounting Department will send member card to customer according to purchasing information

Input : Purchasing Information

Output : Member card

Process :
1. The merchandise was submitted to customer
2. Finance and Accounting Department send member card to customer according to purchasing information

Process No. : 3.2.3

Process Name : Delivery Billing Statement

Description : The billing statement will be sent to customer after get the member card by Finance and Accounting Department

Input : Purchasing Information

Output : Billing Statement

Process :
1. Check cycle cut date of customer from purchasing information
2. Finance and Accounting Department send billing statement to customer

Process No. : 4.1

Process Name : Create Purchasing Summary Report

Description : Create purchasing summary report

Input : Merchandise and customer information

Output : Purchasing summary report

Process : 1. Check leased merchandise and purchasing information

2. Create purchasing summary report

Process No. : 4.2

Process Name : Create Dealer Performance Report

Description : Create dealer performance report

Input : Merchandise and customer information

Output : Dealer performance report

Process : 1. Check leased merchandise and purchasing information

2. Create dealer performance report

Process No. : 4.3

Process Name : Create Payment Advice Report

Description : Create payment advice report

Input : Merchandise and customer information

Output : Payment advice report

Process : 1. Check leased merchandise and purchasing information

2. Create payment advice report





APPENDIX D
REPORT DESIGN

Siam A&C Co., Ltd.						
Purchasing Summary Report						
Date 5/10/03						
Name	Surname	Merchandise	Approval Date	Approval Code	Approval Amount	
Approval Report						
1	Tawiwat	Boonchoo	TV	5/10/2003	S030130928	19,900
2	Thawida	Kengwinit	Air	5/10/2003	S030110342	29,900
3	Wilaiwan	Thammasit	Car Acc.	5/10/2003	S030121345	50,000
4	Komsan	Sumransukkawat	Furniture	5/10/2003	S030122346	20,000
Total						119,800
Rejection Report						
1	Somchai	Rakchar	Computer	-	-	-
2	Somying	Jaidee	TV	-	-	-
Total Approved = 4						
Total Rejected = 2						

Figure D.1. Purchasing Summary Report.

Siam A&C Co., Ltd.				
Dealer Performance Report				
Date 1 - 31/10/2003				
	Dealer Code	Dealer Name	Main Product	Sales Volume
1	190113112	Modern Air	Air	11,000,000
2	190113234	Modern Plus	Furniture	300,000
3	190113879	Future AV	Electrical	3,000,000
4	190438756	UTV Audio	Electrical	2,400,000
5	190348989	Thai Telecom	Mobile Phone	1,000,000
Total				17,700,000

Figure D.2. Dealer Performance Report.

Siam A&C Co., Ltd.						
Payment Advice Report						
Date 10/10/03						
	Name	Surname	Merchandise	Approval Date	Approval Code	Approval Amount
1	Tawiwat	Boonchoo	TV	5/10/2003	S030130928	19,900
2	Thawida	Kengwinit	Air	5/10/2003	S030110342	29,900
3	Wilaiwan	Thammasit	Car Acc.	5/10/2003	S030121345	50,000
4	Komsan	Sumransukkawat	Furniture	5/10/2003	S030122346	20,000
Total Payment						119,800
Payment Date 15/10/2003						

Figure D.3. Payment Advice Report.



APPENDIX E

ENTITY RELATIONSHIP

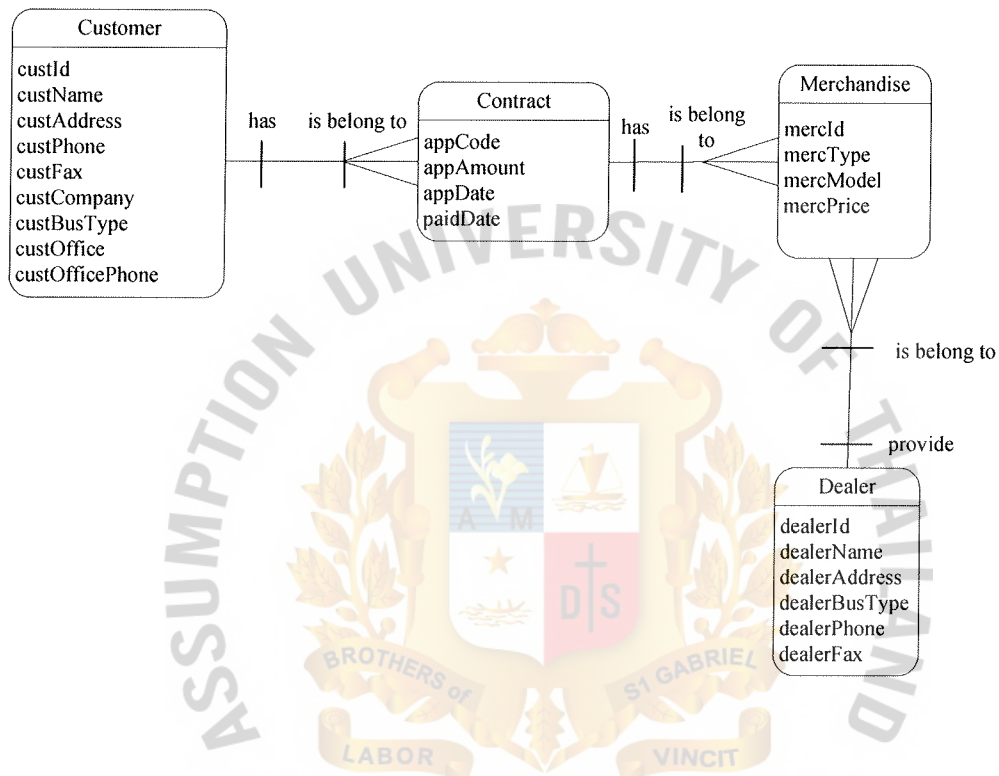
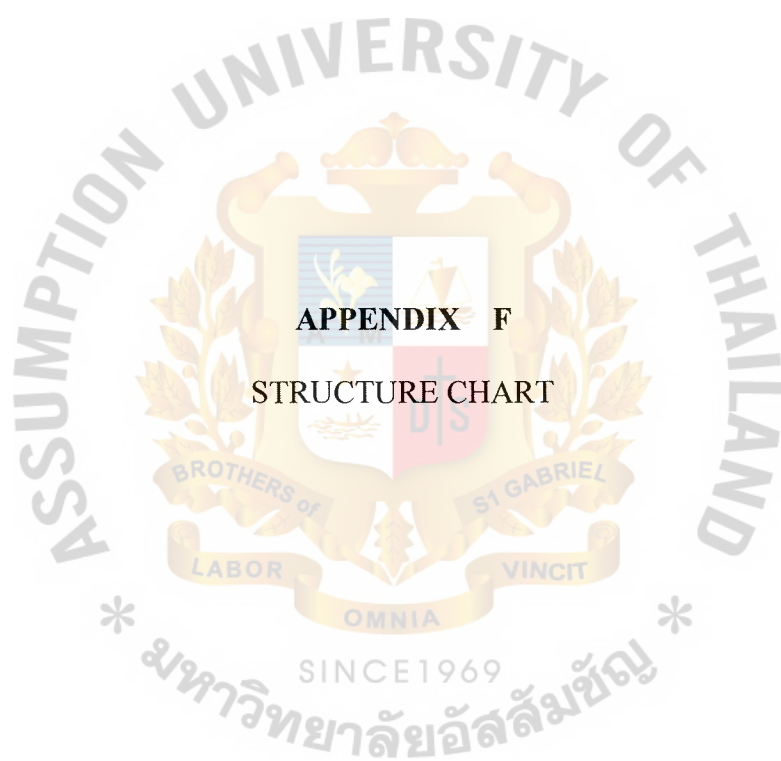


Figure E.1. Entity Relationship.



APPENDIX F
STRUCTURE CHART

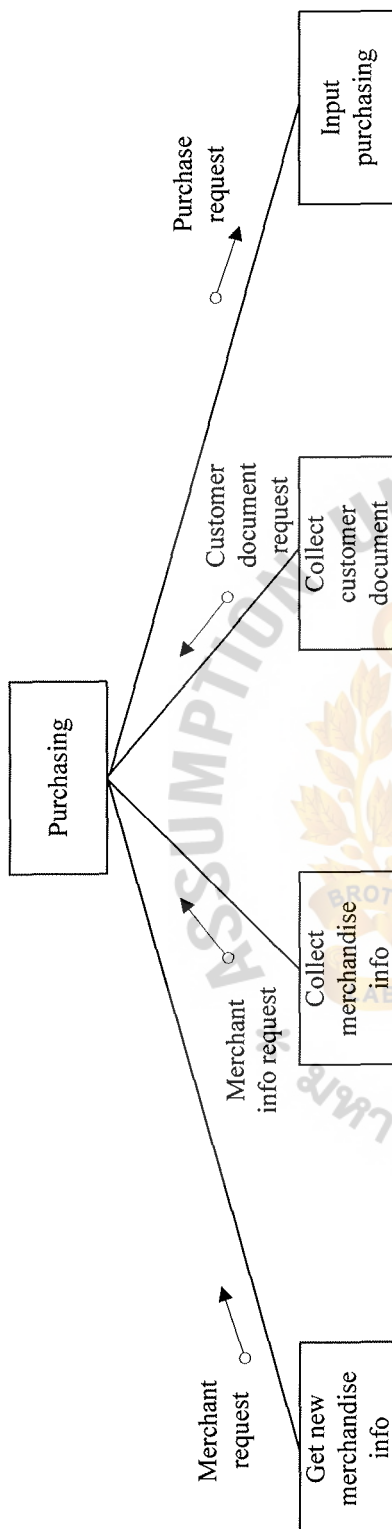


Figure F.1. Purchasing Process.

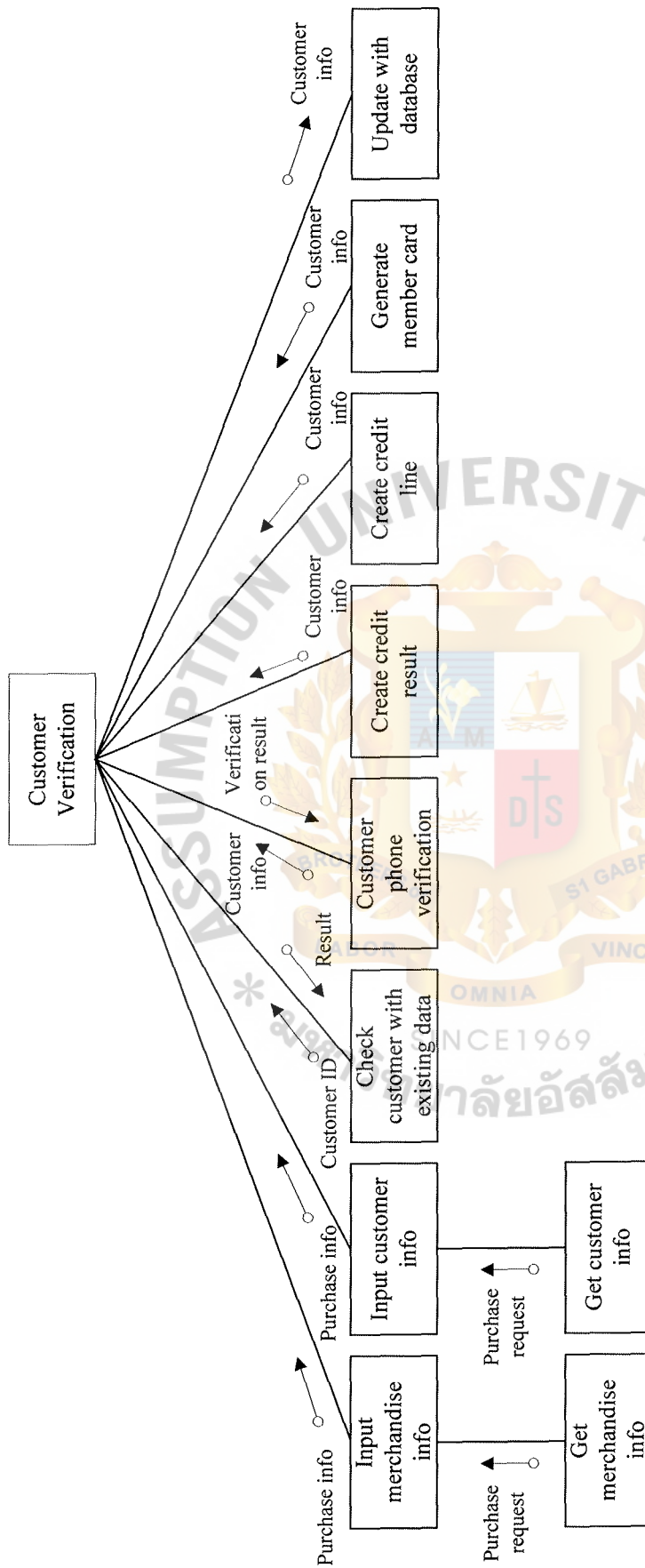


Figure F.2. Customer Verification Process.

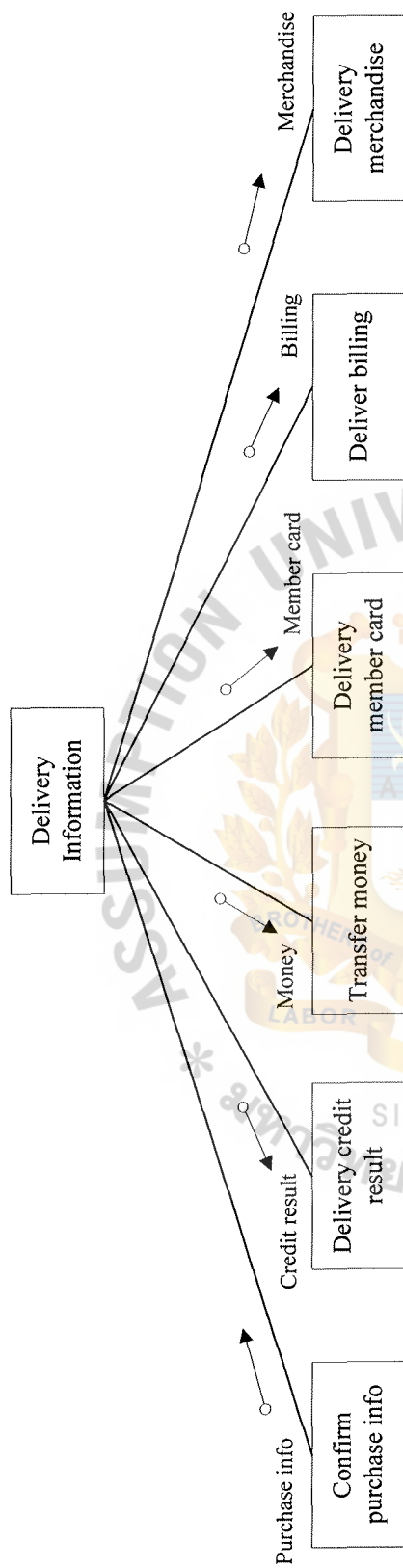


Figure F.3. Delivery Information Process.

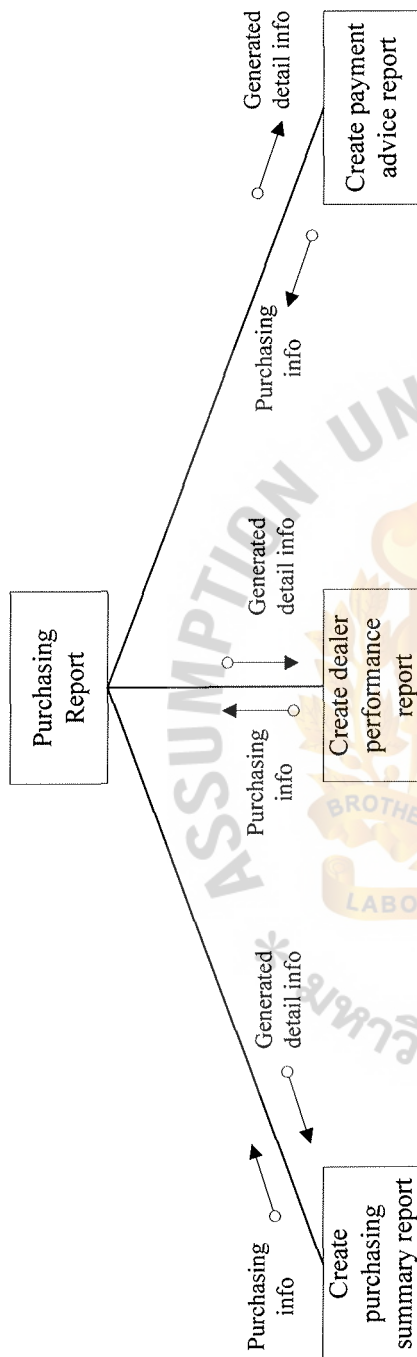


Figure F.4. Purchasing Report Process.



APPENDIX G

CANDIDATE ANALYSIS

Table G.1. Candidate Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of Systems Computerized : A description of the portion of the computerized system.	Package Online Approval system. This application cannot be customized by technical staff.	Knowledge base and online approval application in relation to support user requirement.	Online Approval System. Need customization some requirement.
Benefit: The benefit of each alternative that the company should consider in order to make decision.	To gain competitors advantage and speed of processing.	Fully support user requirements and business process.	To support business process.
Server and Workstation: The needs of server and workstation to support alternatives.	Pentium IV 2.4 GHz. RAM 640 MB for server, Pentium IV 1.8 GHz, RAM 256 MB for workstation.	Pentium IV 2.4 GHz. RAM 640 MB for server, Pentium IV 1.8 GHz, RAM 256 MB for workstation.	Pentium IV 1.8 GHz, RAM 640 MB for server, AMD Duron 1000 MHz, RAM 256 MB for workstation
Software Tools Needed: Tools needed for facilitating each candidate such as computer programming languages.	Microsoft Windows 2000 Server, JAVA and HTML	Microsoft Windows 2000 Server and HTML	Linux Delphi
Method of Data Processing: An alternative solution to data procession.	Internet	Internet	Internet
Output Devices and Implications: The devices that will be used to show, present document information.	HP-Laser Jet	HP-Laser Jet	HP-Laser Jet
Input Devices with Implications: A device that will be used to enter data into the system in order to store or process.	Keyboard and mouse	Keyboard and mouse	Keyboard and mouse
Storage Devices and Implications: A Description of the storage device that will allow information to be retrieved from databases.	DB2	SQL Server	My sql
Technical Staff: A Description of the alternative way for the company to hire the people who have knowledge about the new technology.	To hire new employees who have the knowledge.	The technical staffs have the knowledge about new technology.	To hire new employees who have the knowledge.

Table G.2. Alternative Candidate Requirement Analysis.

Characteristic	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized			
- Online System	X	X	X
Benefit			
- Competitive advantage	X		
- Support business processes		X	X
Server			
- Pentium IV 2.4 GHz, RAM 640 MB	X	X	
- Pentium IV 1,8 GHz, RAM 640 MB			X
Workstation			
- Pentium IV 1.8 GHz	X	X	
- AMD Duron 1000 MHx			X
Operational system			
- Microsoft Windows 2000 Server	X	X	
- Linux			X
Software Tools			
- ASP		X	
- JAVA	X		
- Delphi			X
- HTML	X	X	X
Method of Data Processing			
- Internet	X	X	X
Output Devices and Implications			
- HP- Laser Jet	X	X	X
Input Devices and Implications			
- Keyboard	X	X	X
- Mouse	X	X	X
Storage Devices and Implications			
- DB2	X		
- SQL		X	
- My sql			X

Note: X means the characteristic that each candidate processes.

Table G.3. Feasibility Analysis Matrix.

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
<u>Operational Feasibility</u> Functionality: A description of to what degree the candidate would benefit the organization.	30%	Support only helpdesk functionality and has to be modified or customized to complete with business process. Score: 80	The candidate supports all business requirements. Score: 100	The candidate supports business requirements. But need to modify some function. Score: 80
<u>Technical Feasibility</u> Technology: A description of the maturity of the technology used in each candidate Expertise: An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.	30%	Pentium is widely accepted and supported by various computers. Current employees are promoted and trained to support the system, they may not have any on hand experience. Score: 85	Pentium is widely accepted and supported by various computers. Employees will have the experience supporting the developed system. Score: 90	AMD is not as widely used compared to Pentium but its performance is comparable. Employees will have the experience supporting the developed system. Score: 80
<u>Economic Feasibility</u> Cost to Develop (Baht) Payback Period: Net Present Value	30%	1,941,000 1 Year 8 months 4,556,740 Score: 75	1,730,000.00 1 Year 6,675,602.42 Score: 85	1,532,000 10 Months 3,453,654 Score: 90
<u>Schedule Feasibility</u> An assessment of how long the solution will take to design and implement	10%	4 months Score: 100	4 months Score: 100	4 months Score: 100
Ranking	100%	85.00%	92.50%	85.00%

We used the above feasibility analysis matrix to rank the candidates to know what choice is the best by scoring and weighting the feasibility criteria. For Online Credit Approval System project, we can summarize the bet choice as Candidate 2. It can support fully user requirement and spend the less money in system development compared with other candidates.

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