



KIOSK SERVICE SYSTEM ANALYSIS AND DESIGN

by

Mr. Kanittha Sangngern

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

April 2001

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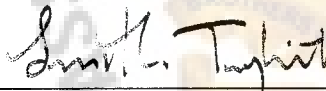
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Project Title	Influencing Factors of Survival ISPs in Competitive Environment
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The Graduate School of Assumption University has approved this final report of the three-credit course. CE 6998 PROJECT,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

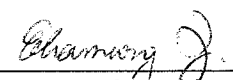
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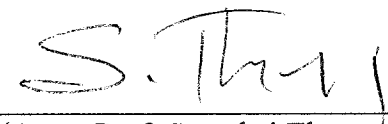
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I. INTRODUCTION

1.1 Background of the Project

To be successful most traditional companies seeking to grow their profits and sales have to spend considerable time and resources searching a market for new customers. In contemporary business, it is not enough to be market share leader. Today's companies must pay closer attention to their customer defection rate (the rate at which they lose customer) also. Especially in mobile business, there is high competition. The high customer defection rate can cause profit loss and bad image of the company.

To be a leader of mobile operator in Thailand, AIS company always cares for customer loyalty and retention. The company's core revenue is airtime using of the customer. Although as of December 2000, there are 1.3 million subscribers in networks including GSM, NMT and Prepaid (One-2-Call), the company tries to apply new technology to improve the satisfaction of subscribers.

Since the end of last year, the company had expanded services to customer based on Web technology such as a bill presentment on the Web, User Center on the Web etc. 1 year of installing online service, there are 25,000 users of the service on the net. This amount is about 2% of all company's subscribers. Given more channels to deliver our services to customer is a way to increase users to use new services. Kiosk services have been designed to be a channel to deliver value added services to company's customer because kiosk is a machine which can offer direct response services to customer and can be placed in stores, airports, and other locations.

The infrastructure of the system has a concept similar to Service on the Net, but it tries to reduce weak point of service on the net. The customer can easily reach to a new channel of service by making transaction at kiosk station in the department store,

community center and etc. Customers of kiosk service do not need to have their own internet account to use service on internet. They need a mobile of MS. The fee of service is free for MS customer at kiosk station.

The benefits of company are having more channels for customers to connect to and use MS service, reducing employee work time to answer customer's question, reducing company cost to hire employee and other company for online service to customer, and creating company image as technology leader in telecommunication business.

For this project, I will analyze the present system in service on the net in the purpose of developing new system on kiosk station. The application of designing is on kiosk environment. Some services which exist on the net probably do not have on kiosk because of limitation of kiosk environment. But, I will add a new service to kiosk for more customers' convenience.

1.2 Objectives of the Project

To implement the kiosk services system for AIS customer services.

- (1) To provide customers the company information kiosk pages give information about new handset model, promotion, and new services of company.
- (2) To provide customers the mobile invoice of last 1, 2 months and current mobile invoices are available at kiosk terminal for member to view it.
- (3) To provide the inquired and updated content of customer information, customers can inquiry and update their own mobile's value added services.

In case of lost mobile, they can pend mobile service at kiosk terminal also.

- (4) To use kiosk service for increasing customer self-service channel, there are a lot of numbers of company's customers. The more customer self-service channels, the more customer satisfaction.
- (5) To reduce service cost at front office. The company intends to develop not only quality of network but also for quality of service. To meet objectives of the company, it should increase customer service staff but that needs much money. Kiosk service terminal can support many customers at a low cost operation, if it is compared to staff cost.

1.3 Scope of the Project

This project focuses on customer services on kiosk terminal. This project begins with problem studies of the existing system at service on the net system. To improve quality of service of the company and service satisfaction of the customer, this project develops self-service kiosk system. Main concepts are to reduce customer service workload at front office and to increase the number of customer at virtual office by using computer and network technology.

Customer feature services are to provide both non member and member of the kiosk system. For non-members, they can view information about promotion, mobile handset price list, and other information about the company. Furthermore, non-members who are AIS subscribers can instantly apply to the system at kiosk.

For system member, the system provides online service on the kiosk terminal for member's convenience. This project studies requirement and specification of hardware, software, application and service features that are appropriate to the kiosk environment. Moreover, the project also studies economic feasibility and implementation plan of the proposed system.

Consequently in feasibility study, the proposed system scopes in a 5 years study with 10 kiosk service stations.



1.4 Project Plan

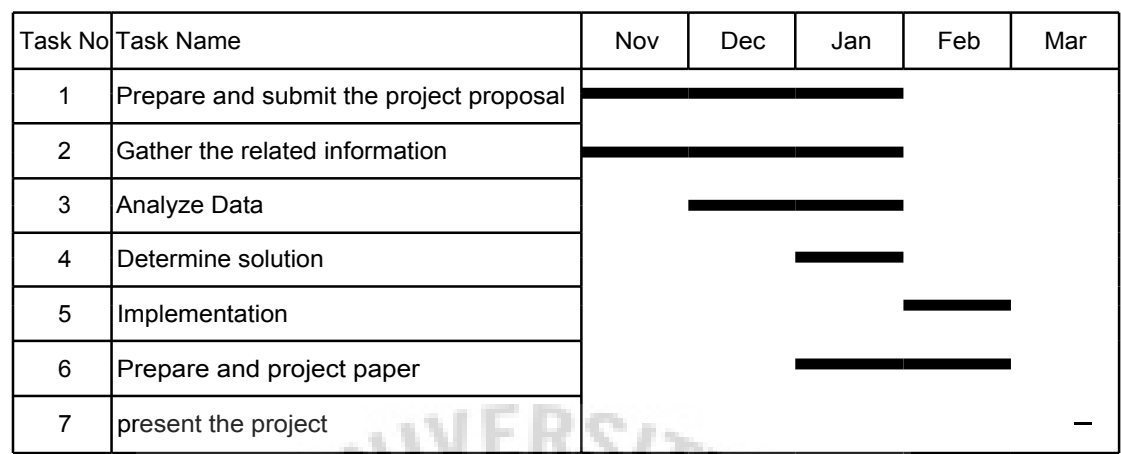


Figure 1.1. Gantt Chart.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Advanced Info Service Public Company Limited (AIS) is a computer business which was established in 1986. In 1990, the company was granted a 20-year BTO (Build-Transfer-Operate) concession from the Telephone Organization of Thailand (TOT) to operate cellular phone networks using NMT (Nordic Mobile Telephone) 900 and Digital GSM (Global System for Mobile Communications) standard at a frequency of 900 MHz.

In 1995, the company started the first Digital GSM's Automatic International Roaming service in Hong Kong. Later, in 1996, the 20-year concession was extended to 25 years. In the end of 1996, Digital GSM expands its network to all provinces in Thailand. Later, Digital GSM launched GSM Internet Integration in 1997. In the end of 1997, the company implemented SIS, anti-cloning protection system, entering over 700,000 Cellular 900 handsets. Later the company implemented Fraud Management System, monitors cellular phone call 24 hours a day to spot irregularities. This ensures that innocent subscribers whose handsets are misappropriated for instance, do not face exorbitant bill. Then, in 1998 there were Grand Opening Priority Call Center 271-9000, the world class call center providing the consistent and accurate information for Cellular 900 and Digital GSM subscribers. In 1999, the company implemented the prepaid system and service on the net in the area of website WWW.ais900.com.

MS was listed in the stock Exchange of Thailand (SET) on November 5, 1991. In 1993, The company expanded its wireless communication networks by investing in Advanced Paging Co., Ltd., a market leader in paging service: "Phonelink". MS holds

60% of shares in Advanced Paging. Operation analog NMT 900 and Digital GSM mobile phone networks, MS is the mobile phone market leader in Thailand, with total subscribers of 1,270,000 at the end of 2000.

In the future, MS still has to improve the system capacity and performance. MS continues to install more Transmission Links that provide connections between handsets and RBSs, employing all types of transmission links-microwave, fiber optic and satellite transmission systems. The customer benefit is that they can use their mobile every where not only in Thailand but also in other countries by GSM's Automatic International Roaming service.

Moreover, the company emphasizes on the high satisfaction of the customer by customer services. The company continues to expand point of service for customer convenience to connect to MS. The customer can easily use our services such as paying balance, changing mobile owner, disconnecting their mobiles, and pending their mobiles at every service point nationwide.

2.2 Existing Business Functions

The existing business functions of the organization of AIS can be classified as follows:

- (1) Main service as wireless network operator

The company operates cellular phone networks using NMT (Nordic Mobile Telephone) 900 and Digital GSM (Global System for Mobile Communications) standard at a frequency of 900 MHz.

- (2) Support service at service points

(a) Branch Office

The company has 11 branches to support the customer throughout the country, there are 8 outlets all over Bangkok which located at Shinawatra 2 building, Future park (Bang-Khae), World-Trade Center, Future Park (Rang-sit), Bang-Chang glass house, Central (Bangna), Central (Pinklao), and Fashion Island.

Moreover, There are 8 branches through out which located at Chiangmai, Hatyai, Nakorn-ratchasima, Nakorn-Sawan, Surat-Thani, U-dorn-Thani, Chonburi, Nakorn-pathom.

(b) Service Center

The company has expanded its service centers and dealer shops nationwide. Every service center has an online system that links to the computer center of the company.

(c) Service on the net

The company has a website, www.ais900.com, which provides information of the company and service information to customers.

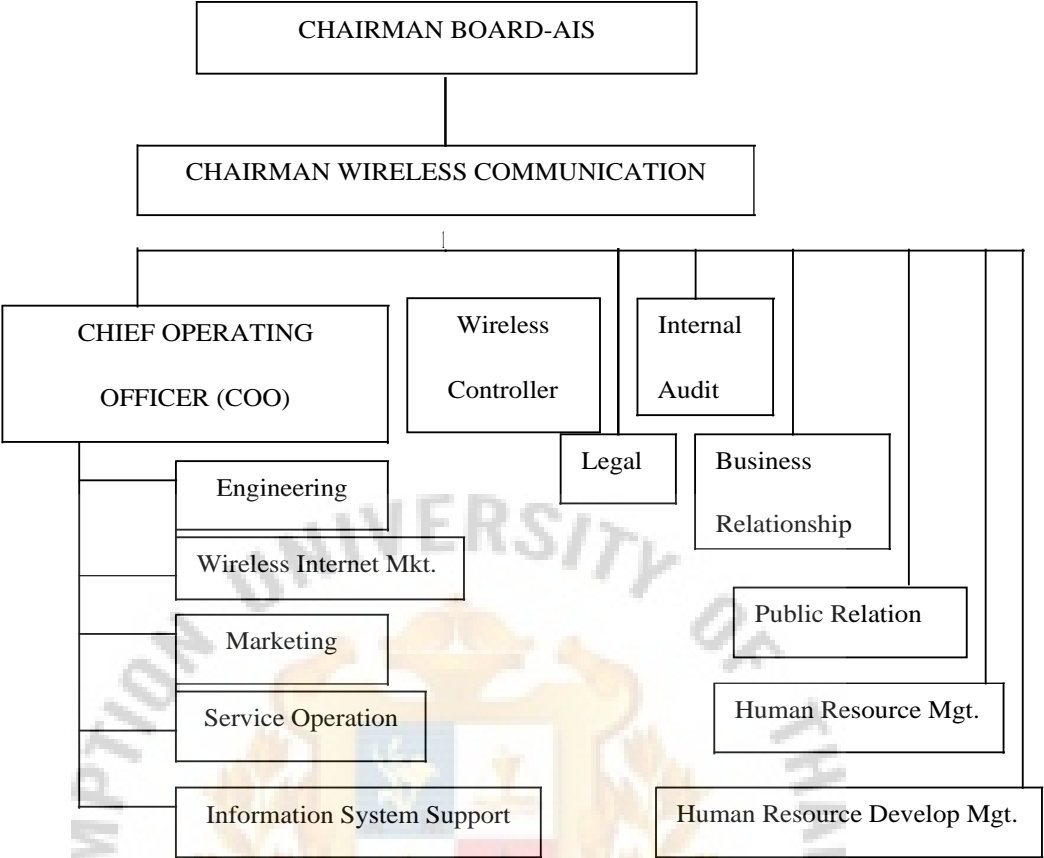


Figure 2.1. Organization Chart of AIS.

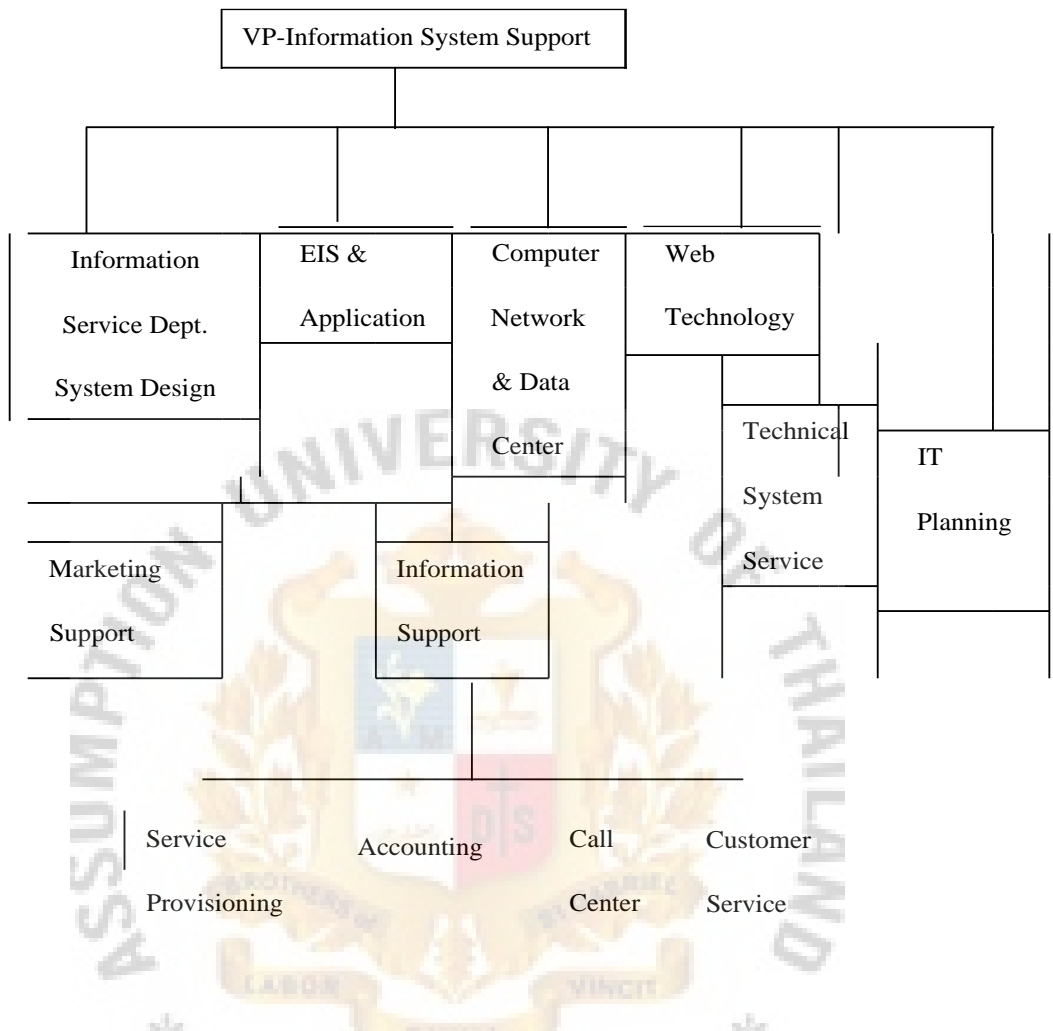


Figure 2.2. Organization Chart of Information System Support.

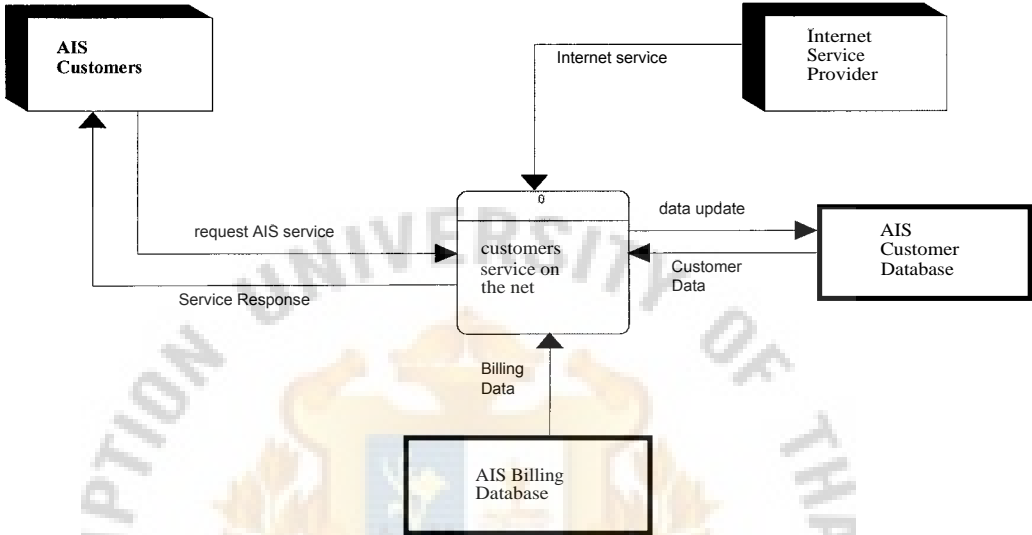


Figure 2.3. The Context Diagram of the Existing System of the Service on the Net System.

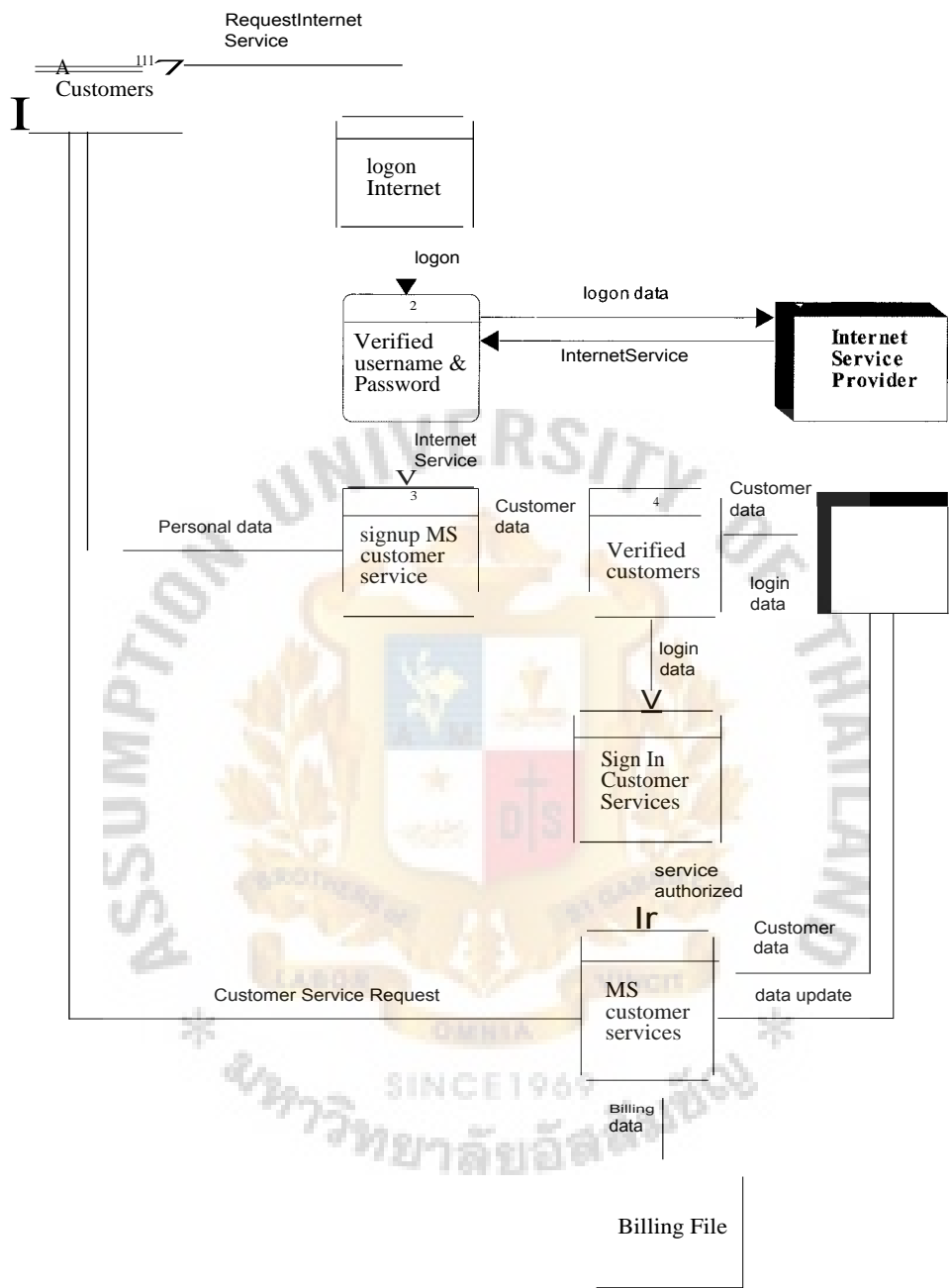


Figure 2.4. The Data Flow Diagram Level - 0 of the Existing System of the Service on the Net System.

2.3 Current Problems and Area for Improvements

2.3.1 Overview of the Service on the Net System

The main strategy of AIS is to sustain the position of being the mobile network that offers the best service in term of network coverage, network quality both indoor and outdoor, and to continue focusing on customer retention program in order to keep high profitable customer and to maintain customer base.

To provide more customers' satisfaction services, AIS offers subscribers electrically service transaction over the Internet in www.ais900.com. The ais900 website is a self-service Internet to customer. Company brings customer opportunities to find company, product information, and online services.

Online service is limited to system members who sign up for this service first on the customer services link. The sign up process is designed to verify the real owner of the mobile by keying in mobile number and id card no. After that, customers can get their password from the sign up process to log-in into the system. So, customers use only their mobile number and password to login to the service on the net system.

The provided service of service on the net system can be listed as follows:

(1) Billing center

Customers can see the information of their last 3 months statements.

(2) Pay balance

After, seeing their statement, user can pay their balance over the Internet payment.

(3) Search statement

The advance menu of billing center, user can search the calling transaction by conditions.

(4) Inquiry Center

Customers can send a question and recommendation to the company.

(5) Value added Services

Customers can apply or cancel the value added services of their mobile.

(6) User Center

Customer can change their password, E-mail address, billing address, and mobile number status.

(7) Minute plus

Customers can see minute plus points of their mobile.

(8) Call charge check up

Customers can check up their call charge of the present bill cycle.

(9) Reconnect

Customers can pay for the reconnect charge in case their mobiles are disconnected.

(10) International roaming

Customers can check up their International roaming status and their International roaming promotion.

2.3.2 Current Problems

In Thailand nowadays, mobile usage and wireless technology is very popular and the demand in wireless is greatly increasing. To sustain rapid market growths as long as possible, the company continues to improve its network quality and add new service feature to maintain customer satisfaction of the company service. To make customer service cover all subscribers in Thailand, the company has to expand more service points. Traditionally, the company tried to increase counter service and call center. But the operation cost is very high and human's service quality is hard to control. Therefore, the company tries to provide service coverage and service differentiation to customer with the use of computer and network technology. The company's purposes are to help customer get our services easily and do transactions more efficiently by themselves at home over the Internet. This service is called "Service on the Net". Service on the net is installed in a part of www.ais900.com. Since 1998 there is only 2% of the whole subscribers who use the services of Service on the Net. After studying the existing system, problems are found as follows:

- (1) Accessibility to Internet is inconvenient for many potential customers
- (2) Equipment is needed to reach Service on the net such as computer, Internet account and telephone line
- (3) Computer and Internet knowledge is required for customer to get company's service.
- (4) Accessibility to Internet is still expensive.
- (5) Complexity content in www.ais900.com

To make more convenient to customer, company has an idea to bring a self-contained unit that combines hardware and software to blend all current media to

serve customers. A self-contained unit is called "Kiosk". The technology is quite advanced. It allows for kiosks to be very sophisticated stationary robots that can communicate and interact with a user.

According to Service on the net system problem and benefits of purposed service system - Kiosk-, which are the area of improvement will emphasis on the areas as follows:

- (1) Kiosk provides a computer online related service
- (2) Kiosk requires a simple user interface that can be used without training or documentation
- (3) The hardware of kiosk must be rugged and capable of operating unattended for long periods of time
- (4) Touch screen can provide some of these features because they enable a user to enter and display information on the same device and eliminate the need for keyboards, which are prone to break.
- (5) Kiosk can be placed at any places such as shopping center, community center and etc.
- (6) Kiosk has reliable security system

III. THE PROPOSED SYSTEM

3.1 User Requirements

Kiosk service system needs service system, which provides service as follows:

- (1) The general information such as after sale service information, mobile set price and privilege from the company shall be provided to both non-member and member of AIS.
- (2) For personal information of member, customers have to apply before using the service.
- (3) The personal kiosk service system shall provide service to AIS member. Both old members of service on the net and members of kiosk can use the AIS kiosk service.
- (4) Members of MS system can apply to this service via MS service on the net and kiosk station.
- (5) After applying the service, customers could use login to service system immediately by using their own mobile number and password.
- (6) The system shall verify the user of the system by mobile number and password, which is received after signing up from the system.
- (7) The customer has to key in personal Id. no. or passport no. to verify the person.
- (8) Personal services are provide to customers as follows:
 - (a) Apply or cancel Value Added Services such as voice mails service, mobile office service.
 - (b) Change pending status service

- (c) Check up minutes plus point
- (d) Bill presentment service
- (e) Current Call Charge
- (f) Request documents such as invoices or other documents.

The user requirements are translated into system characteristic during design.

An information system can meet user request since it can accomplish the stated following:

- (1) Performs the right procedures properly
- (2) Presents information in an acceptable and effective fashion
- (3) Procedures accurate results
- (4) Provides an acceptance interface and method of information
- (5) Provides a reliable system

The requirement from user is that the proposed system should be able to perform as follows:

- (1) All services can be controlled and be able to access upon right request
- (2) Application is easy to use and implement
- (3) The system can provide information upon user request
- (4) The response time of the service is acceptable
- (5) The service is easily used and understood by customers
- (6) Maintain the consistency and integrity of data
- (7) The presentation data synchronizes to other service channels
- (8) The customer data updates instantly after changing request of customers

3.2 System Design

The proposed system was designed with an aim to solve the weak points existing in the existed system as stated before and also to meet all of the user requirements.

Therefore the proposed system was designed and can be viewed as follows:

The input requirements of the kiosk service system are:

- (1) Mobile no and Identification No. of customers
- (2) Customer database
- (3) Billing database
- (4) Marketing Database

The output services of kiosk service system for customer are:

- (1) Customer convenience is increasing. They can easily get company information from kiosk information page such as promotion and handset price
- (2) Customer can get real time balance including airtime balance usage and other service charge from billing center service
- (3) Customer can activate or cancel mobile value added services at kiosk terminal
- (4) Customer can change immediately mobile status from pending mobile service
- (5) Customer can check up minute plus point and current call charge instantly from minute plus service and current call charge service
- (6) Customer can request service document on line at kiosk station.

Processes of new proposed system

Process 1: Verified customer

Process 2: Sign in kiosk service

Process 3: Serve customers

Process 3.1: Marketing information service

Process 3.2: Billing information service

Process 3.2.1: Load bill to system

Process 3.2.2: Generate bill to XML format

Process 3.2.3: Retrieve bill data to screen

Process 3.3: Call & Get customer service

Process 3.3.1: Show menu to customer

Process 3.3.2: Get customer action

Process 3.3.3: Show active customer data

Process 3.3.4: Update customer data as customer request

Process 3.3.5: Show confirmation data to customer

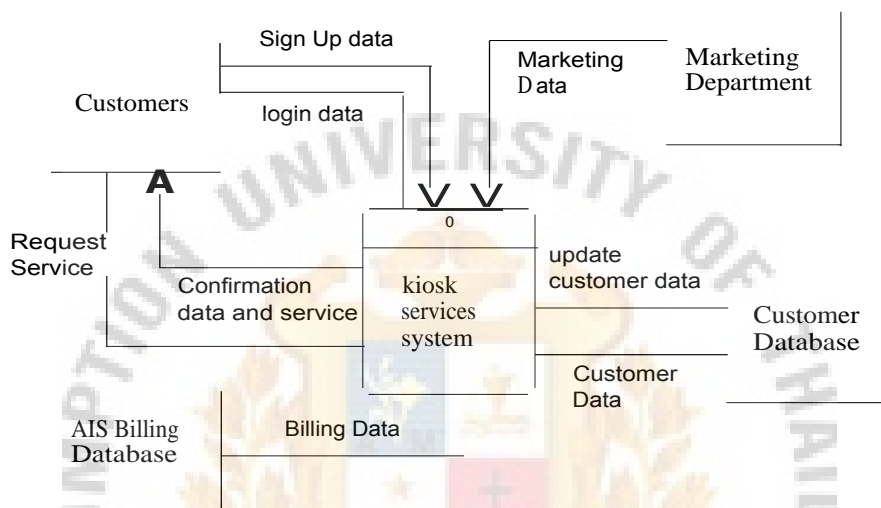


Figure 3.1. Context Diagram of the Proposed System of the Kiosk Service System.

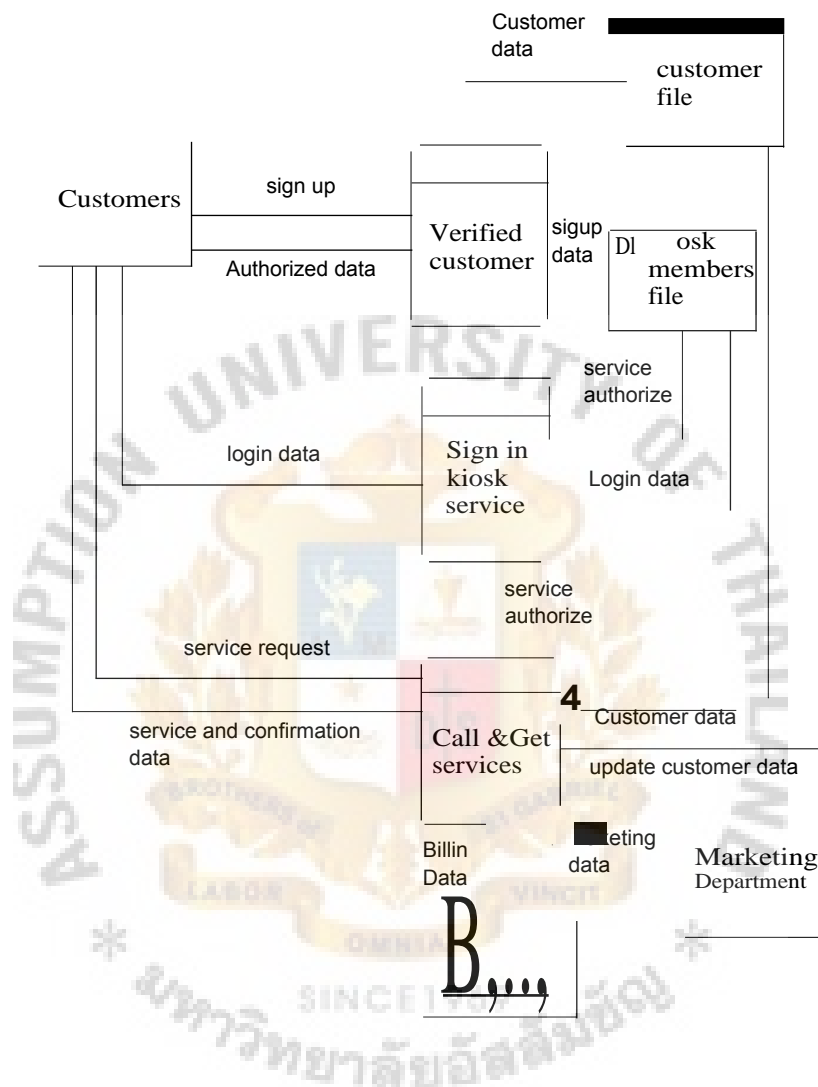


Figure 3.2. Data Flow Diagram Level - 0 of the Proposed System of the Kiosk Service System.

3.3 Hardware and Software Requirements

3.3.1 Hardware Requirement

- (1) Window NT Server 1 system

CPU Number of Processor 2 Up

Memory 64 GB Up

Internal disk storage 252 GB

I/O bandwidth 3.2 GB/Sec

Aggregate bandwidth 12.8 GB/sec

Hard disk 10 GB

RAM 512 MB

Network interface card

Monitor 17" SVGA Color monitor with Non-interface and
low radiation

Keyboard 101 keys Thai/Eng

Mouse

- (2) Kiosk station 10 systems

CPU Processor 266MMX - Pentium III 500 MHz

RAM memory 32-128 MB

Hard disk 2.1-6 GB

USB Ports

Serial Ports, 10/100 Ethernet LAN

Monitor 12.1" TFT

12.1" LCD Touch Screen

Virtual keyboard

12.1" LCD Touch Screen

Virtual keyboard

Surge Protection/UPS

Speaker and amplified external speaker jack

Wireless Lan

Thermal Printer

3.3.2 Software Requirement

NT Server

- (1) Windows NT Server 4.0
- (2) Web Server Application

Client

- (1) Windows NT Operating system
- (2) Explorer or Netscape Browser
- (3) Virtual keyboard Application

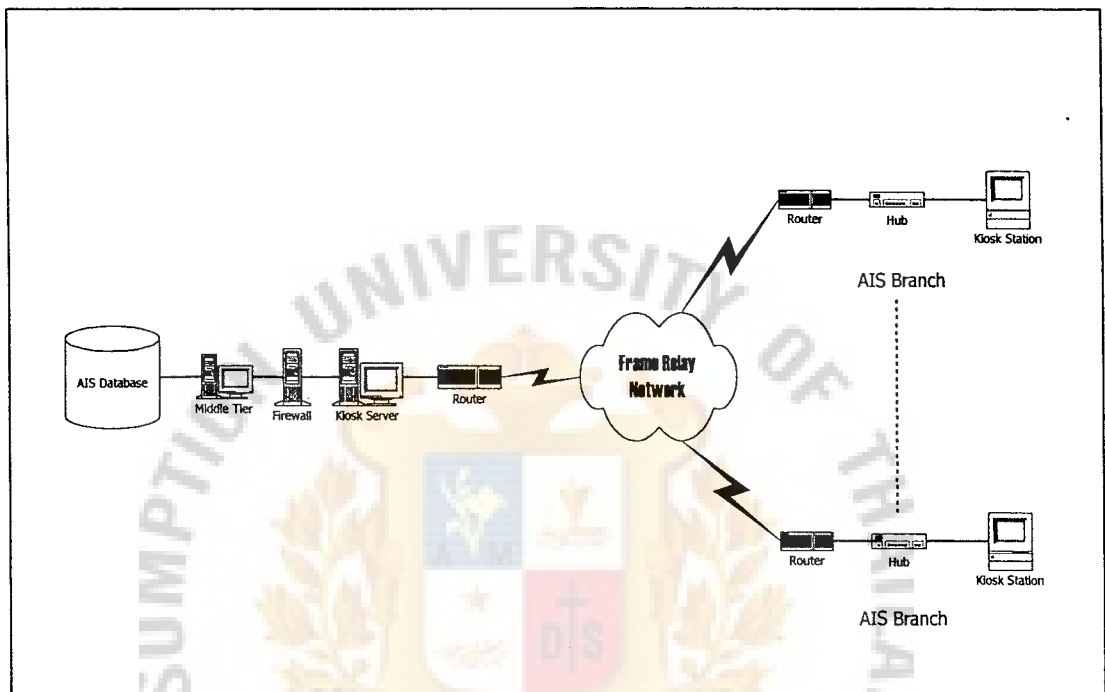


Figure 3.3. System Configuration of the Kiosk Service System.

3.4 Database Design

Kiosk service system is a channel of the company to distribute service to more customers. To achieve security purpose of the system, most database is placed in MS database. This is centralizing database system.

The system only has a member file in the proposed system. It consists of:

- (1) Mobile No Type Number Length 7
- (2) Customer account Type Number Length 10
- (3) Password Type Alphanumeric Length 15

A concerned point in the proposed system is the synchronize of data in the proposed system and company database. The format of both data stores should have the same format and type such as customer database. It is an important point when kiosk page call and get services.

3.5 Documentation

System Documentation

Context Diagram: It is the graphic model of the kiosk service system, which shows a flow of data and information between the system and external entities. See Figure 2.3 for the existing system and Figure 3.1 for the proposed system.

Data Flow Diagram (DFD): It is a graphic model representation and flow of data, processing functions, and data stores which are used to support processing in Kiosk service system. See data flow diagram level 0 in Figure 2.4 for the existing system and Figure 3.2 for the proposed system.

Graphical User Interface Design: It is a screen design of the kiosk service system for interface with user. See Appendix B.

9. Gabriel's Library

Data Documentation

Data Dictionary: It is listing of terms and their definitions for all data items and data stores of Kiosk service system. See Appendix A.

3.6 Security and Controls

One of the most important considerations in the development of system operation is security. When an application program is created, anyone can access the program if needed. Therefore, Advance Information Service PLC. needs to be extremely careful at this point.

The security methods used for the Kiosk service system are passwords and authorization codes. Only those persons with a "need to know" are key-in the passwords and given authorization codes can operate the program. Furthermore, the personal data of customer are confidential information. The mobile number and password of customers are encoded before keeping in data stores. It will be decoded only when verified user at login processes.

Every customer data has be retrieved from AIS database to the purposed system over the data communication. So, all data has to be encoded during data transferring. The decoded process happens only at destination of data.

Also in kiosk display page, all customer displays data are deleted immediately after changing page to prevent customer data for appearing to others.

For kiosk physical security, the kiosk terminal has metal enclosure for ruggedness, key-lock protected power switch, key-lock protected removable media and mechanical protection on electronic box cover.

Logical securities of kiosk are flex disk media (booting and/ or access), power switch (disable via software), diskless LAN load support for version-control, and no accessible hardware reset.

User Training

System gives knowledge to different level of users which are as follows:

- (1) Users in the field of System Administration take care of the system
- (2) Helpdesk and call center receives problems from customers

User Name and Password

Assign user name and password to each user who is assigned to work on the system. Make the rule to change the password period.

Log File of the System

Most installations have printed forms on which the user enter job name, submission time, and other job parameters. This information provides a gross total turn around time in the computer server. Therefore, all processes occur in service system is recorded in log file.

3.7 Cost/Benefit Analysis

3.7.1 Benefit Analysis

Benefit which user will receive from the proposed system can be classified in 2 types, tangible and intangible benefit

Table 3.1. Project Benefit.

Tangible Benefit Worksheet	
Kiosk Services System Project	
	Year 1 through 5
A. Cost reduction (reduce service staff cost) Salary * shift time * month * station = 12000*3*12*10	4,320,000
Total tangible benefits	4,320,000

Table 3.2. Intangible Benefits.

Intangible Benefit worksheet	
Kiosk Services System Project	
• More timely Information	• Information processing efficiency
• Improved organizational Image	• Improved asset utilization
• Improved organizational flexibility	• Improved resource control
• Availability of new, better, or more information	• Increased accuracy in clerical operations
	• Positive impacts on society

3.7.2 Cost Analysis

Table 3.3. One Time Costs.

ONE-TIME COSTS WORKSHEET	
(10 Terminal study)	
	Year 0
A. System study and Architecture design costs	200,000
B. New Hardware	5,500,000
C. Application design & Programming & Content creation	1,000,000
D. User training	100,000
E. Site preparation & Fit client & Store minder implementation	1,000,000
F. Other / Consultation	600,000
TOTAL one-time cost	8,400,000

Table 3.4. Recurring Costs.

RECURRING COSTS WORKSHEET	
SINCE 1969	
	Year 1 though 5
A. Application software maintenance	192,000
B. Incremental data storage requires: 20G * 10,000	10,000
C. Incremental communications	480,000
D. Hardware & Software maintenance	10,000
TOTAL one-time cost	692,000

Break-even Analysis

Break-even analysis determines the point at which the cost of the proposed system equals the cost of the existing system, or the cost of a new system equals its benefits. After determining the break-even point, the analyst subjectively evaluates conditions in the project to assess its acceptability.

Table 3.5. Economic Feasibility Analysis Table.

Cash Flow Description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	TOTALS
Net economic benefit		4,320,000.00	4,320,000.00	4,320,000.00	4,320,000.00	4,320,000.00	
Discount Rate (5%)	1.0000	0.9524	0.9070	0.8638	0.8227	0.7835	
PV of benefits	-	4,114,368.00	3,918,240.00	3,731,616.00	3,554,064.00	3,384,720.00	
NPV of all BENEFITS		4,114,368.00	8,032,608.00	11,764,224.00	15,318,288.00	18,703,008.00	18,703,008.00
One-time COSTS	- 8,400,000.00						
Recurring Costs	-	692,000.00	692,000.00	692,000.00	692,000.00	692,000.00	
Discount Rate (5%)	1.00	0.9524	0.9070	0.8638	0.8227	0.7835	
PV of Recurring Costs	-	659,060.80	627,644.00	597,749.60	569,308.40	542,182.00	
NPV of all COSTS	- 8,400,000.00	- 9,059,060.80	- 9,686,704.80	10,284,454.40	10,853,762.80	-11,395,944.80	-11,395,944.80
Overall NPV							7,307,063.20
Overall ROI - (Overall NPV/ NPV of all COSTS)							0.64
Break-even Analysis							
Yearly NPV Cash Flow	- 8,400,000.00	3,455,307.20	3,290,596.00	3,133,866.40	2,984,755.60	2,842,538.00	
Overall NPV Cash Flow	- 8,400,000.00	- 4,944,692.80	- 1,654,096.80	1,479,769.60	4,464,525.20	7,307,063.20	
Project break-even occurs	between years 2 and 3						
Use first year of positive cash flow to calculate break-even fraction ((3,133,866.40 / 3,133,866.40) = 0.53							
Actual break-even occurred at 2.53years							

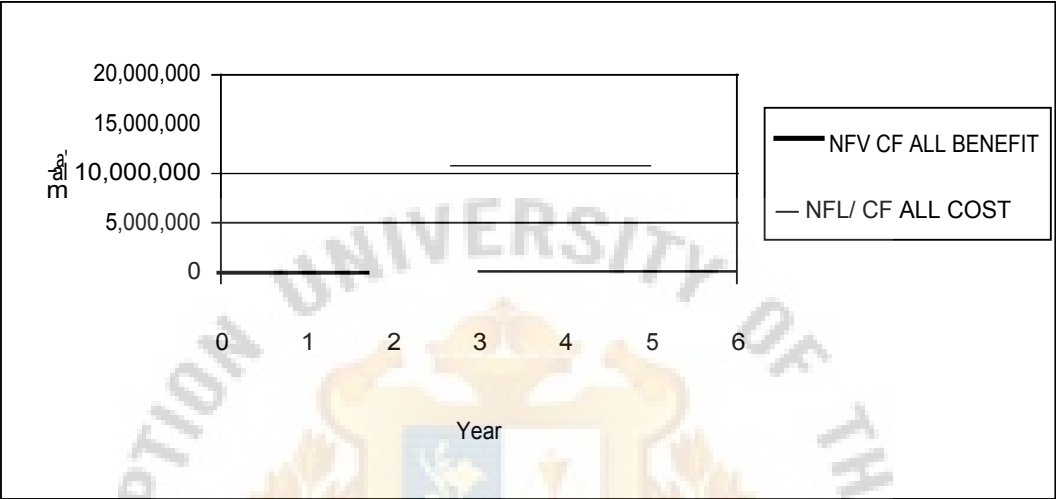


Figure 3.4. Breakeven Analysis of Proposed System.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

The project implementation can be divided into 3 main parts, System analysis, System design and System implementation.

(1) System Analysis

The purpose of systems analysis is to define the logical properties of a system and to solve a business problem, to understand how data flow in the organization, to define processing requirements.

(2) System Design

The purpose of systems design is to transform the logical design specification into a technical design specification. It shows how computer programs are organized and it specifies how all input, output, data file, and processing control requirements are to be designed.

(3) System Implementation

The purpose of system implementation is to translate technical plan into usable software. It involves the purchase of hardware and software, programming and testing and the process of making the hardware and software and tested computer programs operational.

4.2 Test Plan and Results

Plan to test can be classified in 2 parts: program testing and user acceptance testing.

(1) Program Testing

Programmers must release the code they have designed and tested, they have unit test in every module and correction of result. When the unit test are completed they have system test to combine all modules and test correction of input data and output data.

(2) User Acceptance Test

Users who did not write the computer code and who are responsible for determining the requirement completeness of the computer system, testing the response time of the process and seeing if the new system has completeness of document.

4.3 Training Users

User training is one of the most important parts of conversion. It is designed to provide users with hand-on experience with the new system. User can try out software directly, observing how it responds to input entered correctly and incorrectly. Under the watchful eye of the trainer, users gain experience in the use of a system before it becomes operational.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The kiosk services system can increase customer satisfaction. After studying the existing service system, customers take more time at counter service waiting in queue. If they want to use customer services over Internet, they need to have their own Internet account to make a link to MS web site. Moreover, The number of users are limited in technology and computer business group. This service can not reach to large number of customers.

The kiosk services system allows customers to make their transaction by themselves at their fingertip with kiosk anytime at business areas. After implementing the kiosk service system, customer can get convenience and instant services from the company as follows:

- (1) Kiosk service system offers company information as current airtime promotion, handsets price list and up to date after sale service from company.
- (2) Kiosk service system provides customer with online billing information including airtime usage and other service change.
- (3) Kiosk service system enable customers to activate, cancel or update mobile service or service status on line from minute plus, change mobile status or value added service menu.

Moreover, kiosk service system could be great profitable to organization as follows:

- (1) Kiosk service system expands the service place to cover customer with minimal cost, a company can easily and quickly locate more customers with the same quality services.
- (2) Other benefit includes improved image, improved customer service, shorter delivery time, easy access to information, and reduction of front office cost as well as increased flexibility.

5.2 Recommendations

One important criteria in the kiosk services system is the service feature. If the customers can have more service feature at a kiosk station, they will find it more convenient and that creates a better relationship between them and the company. The kiosk station is useful for service where customers seek greater convenience transaction and information about service and value differences. So after implementation of the purposed project, to increase value added of kiosk service system we should add more service feature to customer in the next phase developed. Variety services can be added in kiosk service station such as airtime payment service, reconnect payment or add one-2-call card. Customer may get more convenience from kiosk service station. Company can reduce break-even period from addition service after first phase implementation.

To ensure the new system reaches the company's expectation, an evaluation on customer number of the new system is done after it has been implemented for a while. The number of satisfied customers between the old and new system will be counted and compared to see the difference.

To ensure the new system reaches the customer's satisfaction, an evaluation on system response time of the new system is done after it has been implemented for a while. The number of system response time between the old and new system will be compared to see difference.

If the response time of new system is more than the old system, the alternative concept in database design should be determined. A recommendation database concept is database replication. The response time will decrease from calling directly from MS database.





Table A.1. Data Dictionary.

Object Name	Object Type	Object Short Description
1. Authorized data	Data Flow	Authorized data for user login
2. Billing data	Data Flow	Customer billing data
3. Confirmation data and service	Data Flow	Data update confirmation and change service for customer
4. Customer Data	Data Flow	Customer data for operation
5. Login data	Data Flow	Customer data for login to system
6. Marketing data	Data Flow	Company marketing data, price list
7. Marketing Information	Data Flow	Public marketing information
8. Request service	Data Flow	Request services from customer
9. Service and Confirmation data	Data Flow	Customer service and mobile service and confirmation message to customer
10. Service authorize	Data Flow	Customer Authorize to request services
11. Service request	Data Flow	Data change or mobile service request from customer
12. Sign Up	Data Flow	Customer sign up to system
13. Sign Up data	Data Flow	Customer data —mobile number + ID card no. — For sign up process
14. Update customer data	Data Flow	Update customer data in AIS database
15. Kiosk member	Data store	File which keeps information of kiosk member
16.Billing database	External Entity	Mobile usage Billing Data
17.Customer database	External Entity	All AIS customers database
18. Customer file	External Entity	File which keeps change of customer data

Table A.1. Data Dictionary, (Continued)

Object Name	Object Type	Object Short Description
19. Customer	External Entity	AIS customer
20. Marketing department	External Entity	One section of AIS which is responsible in marketing management
21. Serve AIS customer	Process	Serve AIS service as customer request
22. Sign in kiosk service	Process	Sign in to kiosk system
23. Verified Customer	Process	Verified customer data





Table B.1. Customer File.

Seq.	Field	Description	Type	Length
1	CUST CODE	Customer code	Numeric	10
2	CUST_TITLE	Title of customer	Alphabetic	10
3	CUST NAME	Name of customer	Alphabetic	50
4	CUST BIRTH DATE	Birth date of customer	Numeric	8
5	CUST_ADDRESS	Address of customer	Alphabetic	50
6	CUST_ZIP_CODE	Zip code of address of customer	Alphanumeric	5
7	CUST_MOBILE	Telephone no of customer	Numeric	7

Table B.2. Customer Mobile File.

Seq.	Field	Description	Type	Length
1	MOBILE NO	Customer Mobile No	Numeric	7
2	CUST CODE	Customer Code	Numeric	10
3	MOBILE_STATUS	Status of Mobile	Alphanumeric	2
4	SERVICE_FEATURE CODE	Feature of Mobile	Alphanumeric	3

Table B.3. Mobile Feature File.

Seq.	Field	Description	Type	Length
1	SERVICE_FEATURE _CODE	Feature of Mobile	Alphanumeric	3
2	FEATURE_DESC	Feature description	Alphabetic	50

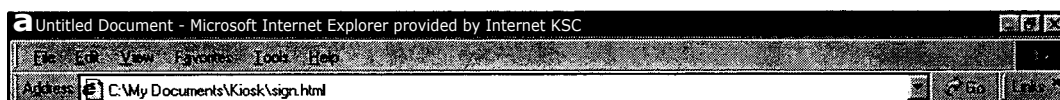
Table B.4. Marketing File.

Seq.	Field	Description	Type	Length
1	PROMOTION CODE	Promotion code	Alphanumeric	10
2	PROMOTION DESC	Promotion description	Alphabetic	50



APPENDIX C

SCREEN LAYOUT



uses irava ONLINE

1. เข้าสู่ระบบและสิทธิพิเศษ
2. บริการหลังการขาย
3. โปรแกรมแก้ไขเอกสารและอุปกรณ์เสริม
- 4.

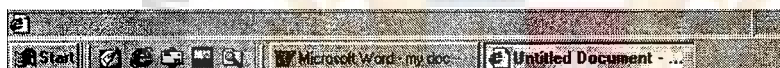
Mobile Number

ID Card Number

CM CEO CEMID
4.11011

nseSfiriluSustiaohu

auuWoiurnsaiiinsuadIstrhu ms
Toutinikilisuuns ngailopirlosinsno



lAmvporrvd,

15 16

Figure C.1. On Line Sign in Screen.

บริการข้อมูล ONLINE

- 1 ข้อมูลและสิทธิประโยชน์
- 2 บริการหลังการขาย
- 3 โทรศัพท์เคลื่อนที่และอุปกรณ์เสริม
- 4

การสมัครใช้บริการ

ยินดีต้อนรับท่านในการสมัครใช้บริการ Service on the net บริการนี้เป็นบริการที่จัดไว้เฉพาะลูกค้าที่มีชื่อจดทะเบียนเป็นผู้ให้บริการหมายเลขโทรศัพท์เคลื่อนที่ในระบบ Cellular 900 และ Digital GSM เท่านั้น โดยท่านสามารถชำระค่าบริการ, ดูยอดค้างชำระหรือรายละเอียดของการบริการ (Statement), เปลี่ยนแปลงที่อยู่, ขอสมัครใช้บริการเสริม เป็นต้น

ผู้สมัครใช้บริการ Service on the net ที่ได้รับการลงทะเบียน (Sign Up) จาก AIS แล้วถือว่าเป็นผู้ให้บริการ Service on the net โดยสมบูรณ์ ซึ่งการใช้งาน (Log on) จะต้องใช้ password ที่ท่านกำหนดไว้กับ AIS ซึ่งท่านจะต้องรักษา password เป็นความลับและสามารถเปลี่ยนแปลงได้ตามความต้องการของท่าน

ผู้สมัครใช้บริการได้อ่านและยอมรับข้อความข้างต้น การดำเนินการใดๆ ภายใต้หมายเลขโทรศัพท์และ password ของท่านถือเป็นความรับผิดชอบเสมือนเป็นการดำเนินการของท่านเองกับ AIS ทั้งนี้ยังคงอยู่ภายใต้เงื่อนไขการให้บริการตามสัญญา แต่ให้บริการตามสัญญาเข้าใช้บริการโทรศัพท์เคลื่อนที่ในหมายเลขของท่านอีกด้วย

ยอมรับ
ยกเลิก

Figure C.2. Apply Condition Information.

1 ขั้นตอน
และสิทธิพิเศษ

2 บริการ
หลังการขาย

3 โทรศัพท์
มือถือและ
อุปกรณ์เสริม

บริการ ข้อมูล ONLINE

ใบสมัครใช้บริการ Service on the Net (Customer Sign Up)

กรุณาลoadข้อมูลเพื่อสมัครใช้บริการ

หมายเลขโทรศัพท์มือถือ
(Mobile No.)

หมายเลขบัตรประชาชน
(Personal ID)

หมายเลขหนังสือเดินทาง กรณีชาวต่างชาติ
(Passport ID in case of foreigners)

อี-เมล
(E-Mail)

รหัสผ่าน
(Password)

ยืนยันรหัสผ่าน
(Password Confirmation)

ยืนยันสมัคร
ยกเลิก
คำแนะนำ

Figure C.3. Apply to System or Sign Up Screen.

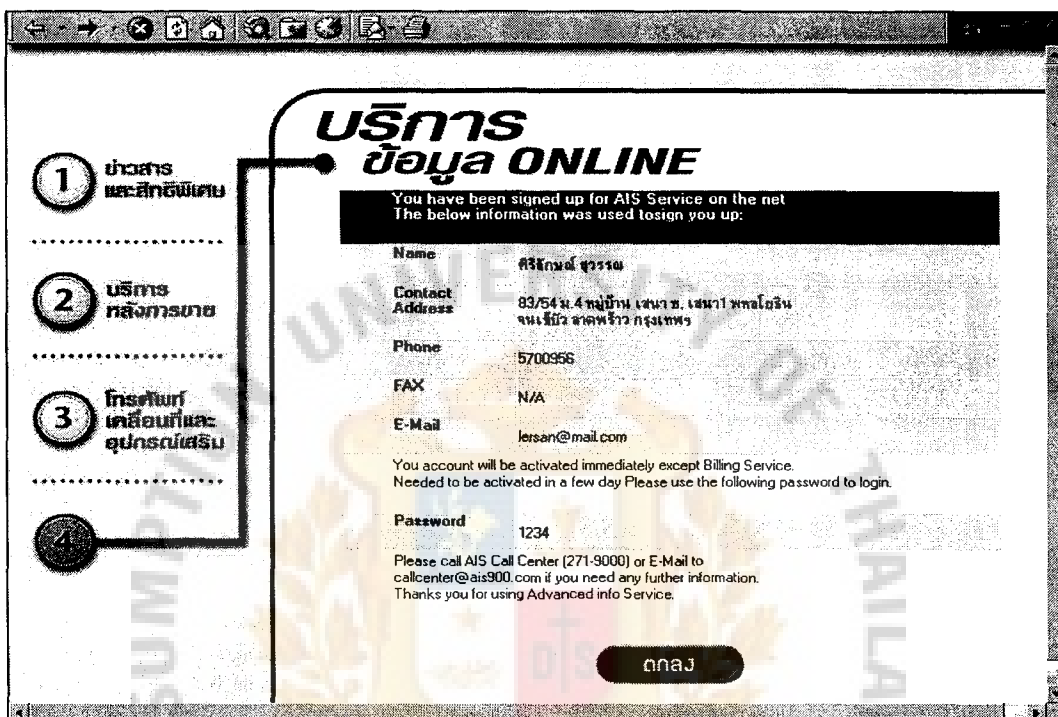


Figure C.4. Confirm Information / Password Screen.



Figure C.5. After Sign Up.



Figure C.7. Billing Center Screen.

บริการเรียกด่วนแจ้งค่าใช้จ่ายรายเดือน

[← กลับสู่หน้าหลัก](#)

รายละเอียดการโทรในขั้นที่ และต่างพื้นที่

1

ข่าวสาร
และสิทธิประโยชน์

2

บริการ
หลังการขาย

3

โทรศัพท์
เคลื่อนที่และ
อุปกรณ์เสริม

4

บริการข้อมูล
ONLINE

รายละเอียดการให้บริการของฝ่ายแจ้งค่าใช้จ่ายรายเดือน IN-17-4304-0125029

Local Toll Call Detail

เลขหมายปลายทาง #	วันที่	เวลา	รายการ	หน่วย (นาที)	จำนวนเงิน (บาท)	
Number	Date	Time	Description	Minutes	Amount	
					รวมเงิน (Total)	300.00

Long Distance Detail

เลขหมายปลายทาง #	วันที่	เวลา	รายการ	หน่วย (นาที)	จำนวนเงิน (บาท)	
Number	Date	Time	Description	Minutes	Amount	
1. 055413262	21/04/2000	20:34:08	8KK*-UTT	1	12.00	
2. 8823037	25/04/2000	21:42:23	BKK*-GSM4	1	12.00	
					รวมเงิน (Total)	24.00

ออกจากระบบ

Figure C.8. Billing Information Screen.



Figure C.9. Value Added Service Screen.



Figure C.10. Voice Mail and Mobile Office Screen.

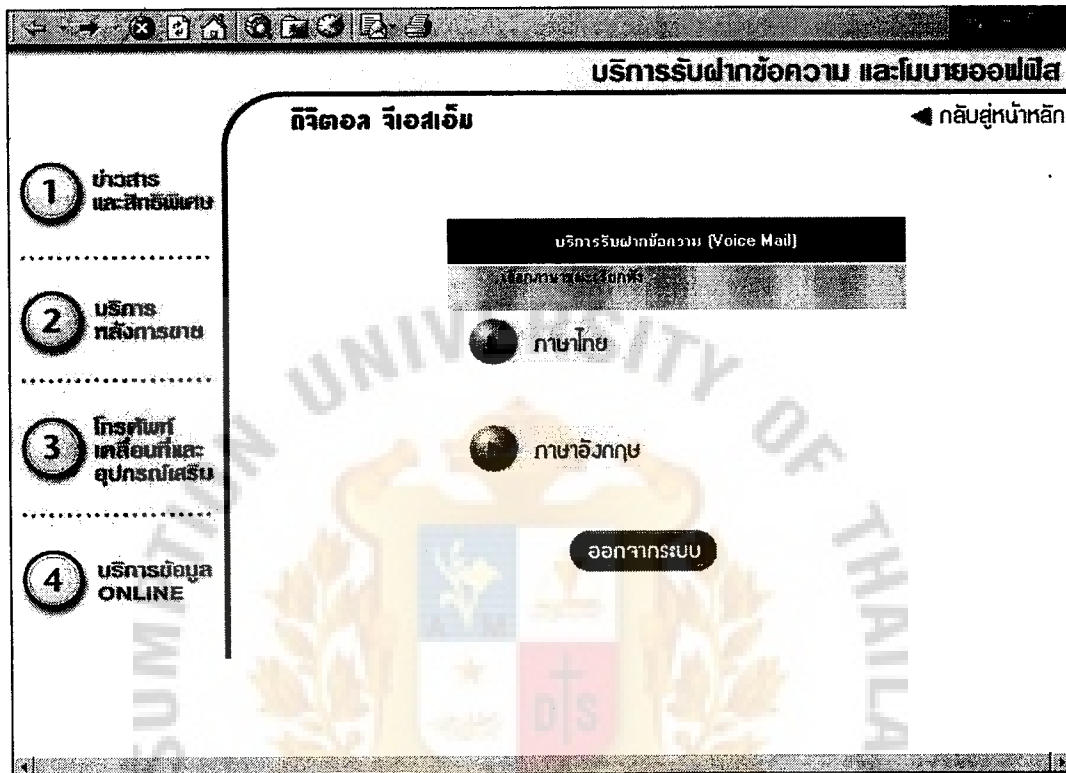


Figure C.11. Language Selection Menu for Voice Mail.

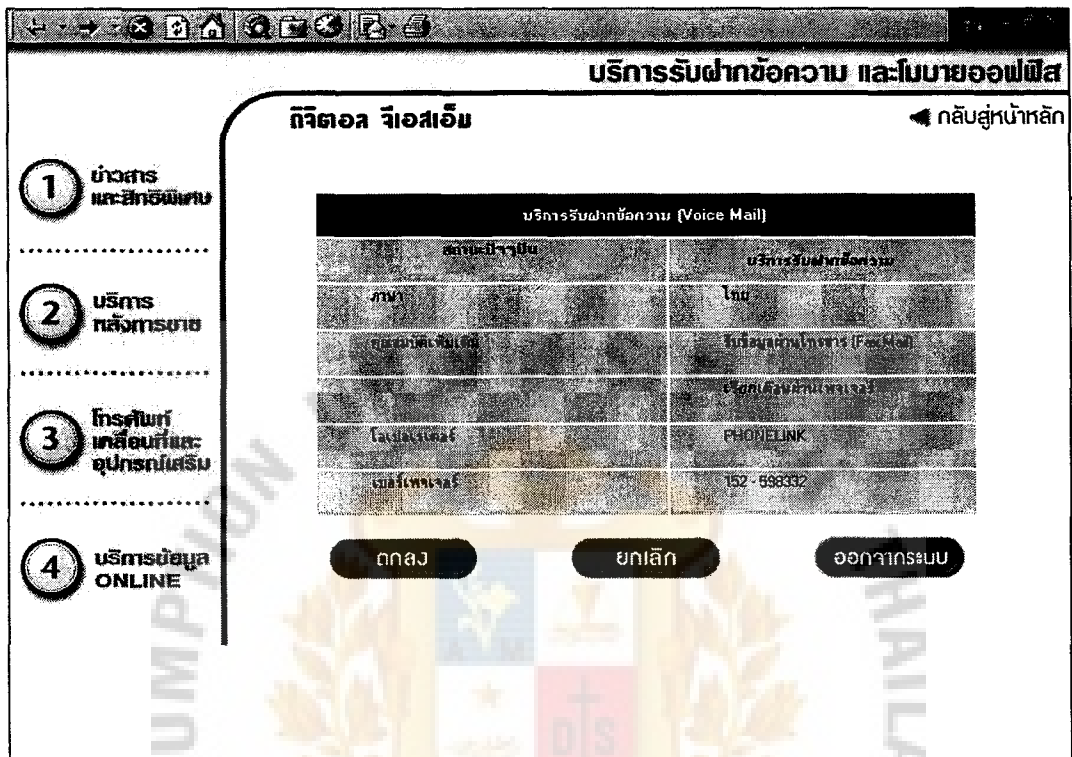


Figure C.12. Confirmation Page for Value Added Service.



Figure C.13. Change to Pending Status.



Figure C.14. Change to Service Status.

บริการตรวจสอบคะแนนมินิพลัส

1 เข้าสู่ระบบและสมัครมินิพลัส

2 บริการหลังการขาย

3 โทรสอบถามเงื่อนไขและอุปกรณ์เสริม

4 บริการข้อมูล ONLINE

Mobile Number: 9999999

Invoice Number IN-14-4385-0115074

คะแนนรอบปัจจุบัน (Point of this statement)	500 Points
คะแนนใช้ไป (Redeem Point)	0 Points
คะแนนสะสมคงเหลือ (Available Point)	2,000 Points

คะแนนสะสมคงเหลือ ณ ปัจจุบัน (Current Points)	2,500 Points
--	--------------

ออกจากระบบ

Figure C.15. Minute Plus Check Up.



Figure C.16. Request Document Type Menu.



* Figure C.17. Request Document Screen.



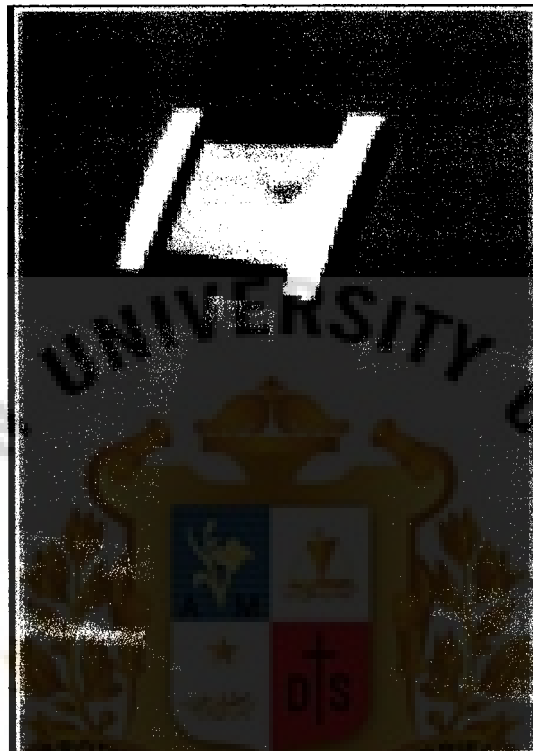


Figure D.1. Kiosk Terminal Design.

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2. <http://www.wepopedia.com>.

