



Digital Map Online

by

Ms. Rungaroon Rakkeitwinai

A Final Report of the Three-Credit Course
IC 6997 E-Commerce Practicum

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Internet and E-Commerce Technology
Assumption University

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Project Title Digital Map Online


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Academic Year March 2005


The Graduate School of Assumption University has approved this final report of the three-credit course, IC 6997 E-Commerce Practicum, submitted in partial fulfillment of the requirements for the degree of Master of Science in Internet and E-Commerce Technology.

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ABSTRACT

This project intends to create a digital map shop website which offers a convenient online shopping system for customers. It will provide various types of map products. Visitors can purchase both products and services on the website via PC access or mobile access.

The report is divided into two main parts. First part focuses on the background and applying the knowledge of e-commerce in order to extend the marketing channel. The second part focuses on the process of designing and developing the interface of the website. It contains site map and layout to show web structure, the database design and data flow diagram for understanding over all system.

Other than the website, the report also includes marketing analysis, marketing strategies and financial analysis in order to achieve the website's goals and targets.

ACKNOWLEDGEMENT

The writer would like to take this opportunity to express her gratitude to the number of people who help and support until this project has been complete.

The writer would like to thank Rear Adminral Prasart Sribhadung, her project advisor, for his valuable suggestions, advice and time given to the preparation of this project. Writer also would like to thank the entire faculty that taught her during Master of Science in Internet and E-commerce Technology. The knowledge that writer acquired from them indeed helped make this a successful project.

She would like to thank her friends, Ms.Kharidtha, Ms.Nathareeyaporn, Ms. Umaporn for their genuine help and criticism in helping her make this report.

Finally, the writer would like to thank her family who encouraged her along the way and who made considerable sacrifices in order to support her throughout.

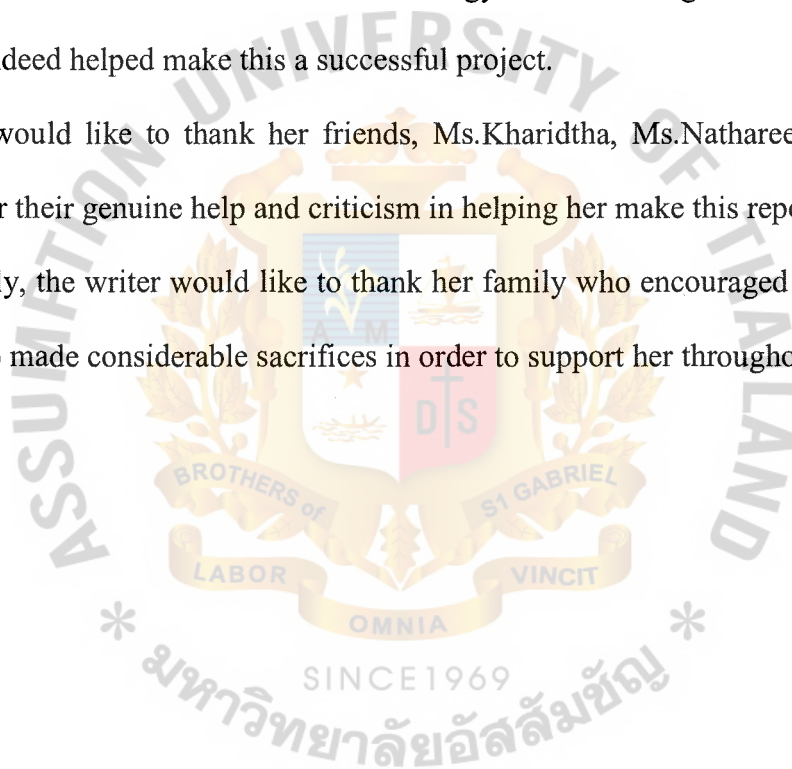


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I. INTRODUCTION

1.1 Background of the project:

In the Information Technology era, people all around the world are familiar with the Internet and E-commerce technology. Information systems are used to manipulate, summarize, query, edit, visualize-generally, to work with information stored in computer databases. Information expressed by digital map suitable for people who need to know what is where. For example, transportation needs to store information on the state of pavement everywhere on highway network, analyze data on accidents. A traveling sale person needs a system in the car for finding location, routes. A school bus operator needs to plan efficient collection routes. Using a digital map is a useful approach to collect the position as vehicle, people who are running on the road in real-time situation.

1.2 Objectives of the project:

The objectives of this project is to create a website which provides digital map and related product information.

1.3 Scopes of the project:

- (1) To study the importance of Internet and E-commerce.
- (2) To develop a website for ThailandMap.Co,Ltd.
- (3) To invest strategies to attract more guest for participating into digital Map technology.
- (4) Market analysis
- (5) SWOT analysis
- (6) Break even analysis

1.4 Deliverables:

- (1) Prototype website shows structure of website, design and interface. It also includes real information and other links.
- (2) Final report describes all details and information about this project including sample picture of website interface.

II. LITERATURE REVIEW

2.1 Characteristics of E-commerce

What is the internet?

The Internet is the world's biggest computer networks, connection millions of people and organization in global information society. The Internet links hundreds of thousand of individual networks all over the world. The Internet has range of capabilities that organizations use to exchange information internally or to communicate externally with other organizations. This giant network of networks has become a major catalyst for both electronic commerce and electronic business.

2.1.1 The world online.

By the end of 1984 over 1000 participants had jointed the rapidly growing Internet. An organizational system was needed, and this led to a creation of the Domain Name System (DNS). It can be noticed that internet addresses end with three latter combinations such as .com, .gov, .org, and others. These domains become even more helpful to internet users as the number of participating networks grew to over 10,000 in 1987 and more than 100,000 just two year later. By 1990 the government dropped its restrictive membership policy, opening the door to any organization with the technology and desire to join the Net. The world at large started to come online. World.std.com set up a shop as the first commercial provider of Internet dial-up access. The private sector moved in at an astronomical pace, creating new business and bringing vast changes and challenges to established industries of all kinds.

2.1.2 E-commerce

With the online community growing everyday, commercial interests have transformed the Internet, and especially the web, into a huge new global marketplace, open 24 hours a day, seven days a week. It offers avenues for advertising, direc sales,

price discounting and many other business opportunities. Collectively, all this Internet business is known as e-commerce.

Today computers are associated with everything we do, and almost everything that can be put on computer is going online. New sites on the World Wide Web were being introduced in early 1990s, an internet website address (or URL) marked a commercial enterprise as up to date. By the late 90s, not having an Internet address had become a real handicap. Online advertising in 1998 total \$ 2 billion. Direct sales over the Internet have begun to take away business from malls and retail stores.

E-commerce is the process of buying and selling or exchanging of products, services and information by computer networks. We focus on digitally enabled commercial transactions between and among organizations and individuals. Commercial transactions involve the exchange of value (e.g., money) across organizational or individual boundaries in return for products and services. Exchange of value is important for understanding the limit of E-commerce.

2.1.3 M-commerce.

Mobile commerce, or M-commerce, refers to the use of wireless digital devices to enable transaction on the Web. Wireless networks are utilized to connect cell phone and handheld devices such as the Palm VIIx to the web. Once connected, mobile consumers can conduct many types of transactions, including stock trades, in-store price comparison, banking, travel reservation, and more. Thus M-commerce is used most widely in Japan and Europe, where cell phones are more prevalent than in the United States, but it is expected to grow rapidly in United States over the next five years.

M-commerce has two major characteristics that differentiate it other forms of E-commerce: mobility and broad reach.

Mobility. M-commerce is based on the fact that users carry a cell phone or other mobile device everywhere they go. Mobility implies portability. Therefore, user can initiate a real-time contact with commercial and other systems from whenever they happen to be.

Board reach. With m-commerce, people can be reached at any time. Of course, users can block certain hours or certain messages, but when users carry an open mobile device, they can be reached instantly.

The benefit of m-commerce:

Ubiquity. Ubiquity refers to the attribute of being available at any location at any given time. A mobile terminal in the form of a smartphone or a PDA that can fulfill the need both for real-time information and for communication independent of the users' location. It creates easier information access in real-time environment.

Convenience. It is very convenient for users to operate in the wireless environment. All they need is smartphone. The technology is making rapid progress. Soon, using GPRS, it will be easier and faster to access information on the Web without boosting up a PC or placing a call via modem.

Instant connectivity. Mobile devices enable users to connect easily and quickly to the Internet, intranets, other mobile devices and databases. Thus, the new wireless devices could become the preferred way to access information.

Personalization. Product personalization enables the preparation of information for individual consumers. For example a user who is identified as someone who likes to travel might be sent travel-related information and advertisements. Product personalization is still limited on mobile device.

Localization of products and services. Such services are known as location-based e-commerce. Precise location information is known when a GPS is attached to a user's

device. For example, a user might use their mobile device to find nearest ATM. Localization can be general, to anyone in a certain location (e.g. all shoppers at a shopping mall). Or even better, it can be targeted so that users get messages that depend both on where they are and where their preferences are, thus combining localization and personalization. For instance, if it is known that a person likes Italian food and they are strolling in a mall that has an Italian restaurant, they might receive a SMS that tells them that restaurant's "special of the day" and offers a 10 percent discount.

2.1.4 Internet benefits

While the internet offers new ways to locate and access existing information, it is also contributing its own wealth of new knowledge, information, and opportunities. For organizations, the Internet is becoming the principal platform for electronic commerce and electronic business because this technology provides so many benefits. The Internet's global connectivity, ease of use, low cost, and multimedia capabilities can be used to create interactive applications, services, and products. By using Internet technology, organizations can reduce communication and transaction costs, enhance coordination and collaboration, and accelerate the distribution of knowledge.

2.1.4.1 Connectivity and Global Reach.

The value of the Internet lies in its ability to easily and inexpensively connects so many people from so many places all over the world. The internet's global connectivity and ease of use can provide companies with access to business or individuals who normally would be outside their reach. Companies can link directly to suppliers, business partners, or individual customers at the same low cost, even if they are halfway around the globe. Business can find new outlets for their products and services abroad because the Internet facilitates cross-border transaction and

information flow. The internet provides a low cost medium for forming global alliances and virtual organizations.

2.1.4.2 Reduced communication costs.

Before the Net, organizations had to build their own wide area networks or subscribe to value-added network service. Employing the internet, although far from cost-free, is certainly more cost-effective for many organizations than building one's own network or paying VAN subscription fees. The Internet can help organizations reduce operational costs or minimize operational expenses while extending their activities. Internet technology can also reduce communication costs by allowing companies to create virtual private networks as low-cost alternatives to private WANs.

2.1.4.3 Lower transaction costs.

Organization has found that conducting transactions electronically can be done at a fraction of the cost of paper-based process.

2.1.4.4 Reduce agency costs.

As organizations expand and globalization continues, the need to coordinate activities in far flung locations is becoming more critical. The internet reduces agency costs, the cost of managing employees and coordinating their work by providing low-cost networks and inexpensive communication and collaboration tools that can be used on a global scale.

2.1.4.5 Interactivity, flexibility, and customization.

Internet tools can create interactive applications that can be customized for multiple purposes and audience. Web pages have capabilities for interacting with viewers that cannot be found in traditional print media. Visitors attracted by alluring displays of text, graphics, video, and sound also can click on hot buttons to make selections, take actions, or pursue additional information. Companies can use e-mail,

chat rooms and electronic discussion groups to create ongoing dialogues with their customers, using the information they have gathered to tailor communication precisely to fit the needs of each individual. Internet applications can be scaled up or down as the size of their audience changes because the technology works with the firm's existing network infrastructure.

2.2 Characteristics of the GIS.

A GIS is a system of hardware, software and procedures to facilitate the management, manipulation, analysis, modelling, representation and display of georeferenced data to solve complex problems regarding planning and management of resources(NCGIA,1990).

Geographic information systems have emerged in the last decade as an essential tool for urban and resource planning and management. Their capacity to store, retrieve, analyze, model and map large areas with huge volumes of spatial data has led to an extraordinary proliferation of applications. Geographic information systems are now used for land use planning, utilities management, ecosystems modelling, landscape assessment and planning, transportation and infrastructure planning, market analysis, visual impact analysis, facilities management, tax assessment, real estate analysis and many other applications.

A more comprehensive and easy way to define GIS is the one that looks at the disposition, in layers (Figure 1), of its data sets. "Group of maps of the same portion of the territory, where a given location has the same coordinates in all the maps included in the system". This way, it is possible to analyze its thematic and spatial characteristics to obtain a better knowledge of this zone.

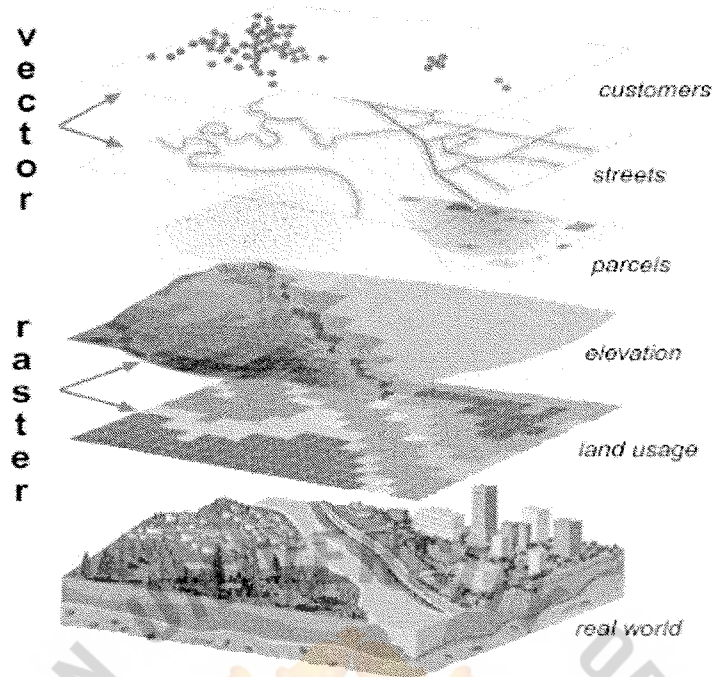


Figure 2.1. The concept of layer (ESRI).

GIS applications

Mapping locations: GIS can be used to map locations. GIS allows the creation of maps through automated mapping, data capture, and surveying analysis tools.

Mapping quantities: People map quantities, like where the most and least are, to find places that meet their criteria and take action, or to see the relationships between places.

This gives an additional level of information beyond simply mapping the locations of features.

Mapping densities: While you can see concentrations by simply mapping the locations of features, in areas with many features it may be difficult to see which areas have a higher concentration than others. A density map lets you measure the number of features using a uniform aerial unit, such as acres or square miles, so you can clearly see the distribution.

Finding distances: GIS can be used to find out what is occurring within a set distance of a feature.

Mapping and monitoring change: GIS can be used to map the change in an area to anticipate future conditions, decide on a course of action, or to evaluate the results of an action or policy.

Geospatial data: Geospatial data has both spatial and thematic components.

Conceptually, geographic data can be 2 main types representation of data.

2.2.1 Raster representation of data

Vector data is comprised of lines or arcs, defined by beginning and end points, which meet at nodes. The locations of these nodes and the topological structure are usually stored explicitly. Features are defined by their boundaries only and curved lines are represented as a series of connecting arcs. Vector storage involves the storage of explicit topology, which raises overheads, however it only stores those points which define a feature and all space outside these features is 'non-existent'.

In the vector based model (figure 2.2), geospatial data is represented in the form of coordinates. In vector data, the basic units of spatial information are points, lines (arcs) and polygons. Each of these units is composed simply as a series of one or more coordinate points, for example, a line is a collection of related points, and a polygon is a collection of related lines.

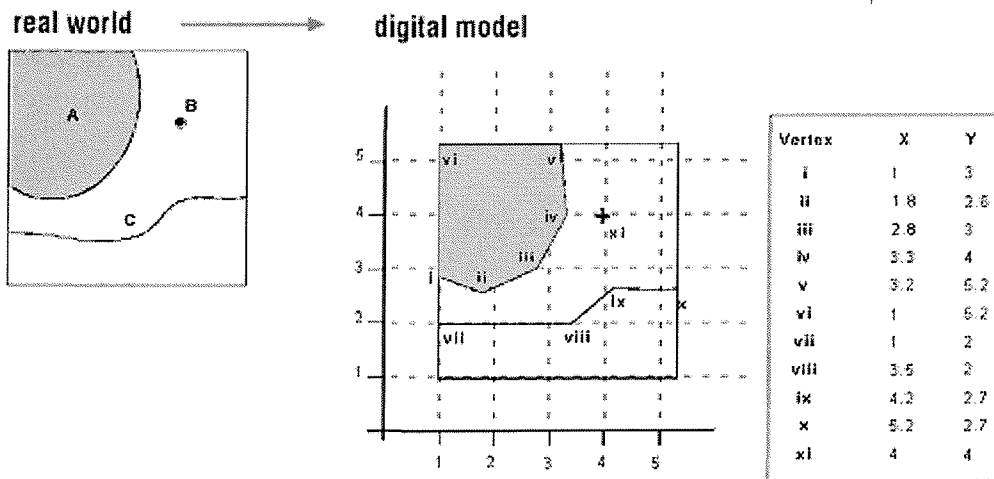


Figure 2.2. Vector representation.

There are different models to store and manage vector information. Each of them has different advantages and disadvantages. For example:

List of coordinates "spaghetti" in this model the characteristic is simple, easy to manage, no topology, lots of duplication, hence need for large storage space, very often used in CAC (computer assisted cartography)

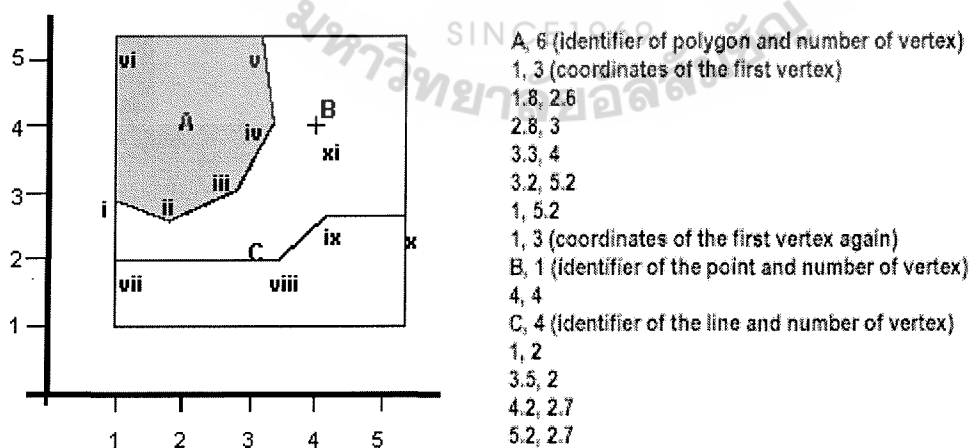


Figure 2.3. List of coordinates "spaghetti" model.

2.2.2 Raster representation of data

Raster is a method for the storage, processing and display of spatial data. Each area is divided into rows and columns, which form a regular grid structure. Each cell must be rectangular in shape, but not necessarily square. Each cell within this matrix contains location co-ordinates as well as an attribute value. The spatial location of each cell is implicitly contained within the ordering of the matrix, unlike a vector structure which stores topology explicitly. Areas containing the same attribute value are recognized as such, however, raster structures cannot identify the boundaries of such areas as polygons.

Raster data is an abstraction of the real world where spatial data is expressed as a matrix of cells or pixels, with spatial position implicit in the ordering of the pixels. With the raster data model, spatial data is not continuous but divided into discrete units. This makes raster data particularly suitable for certain types of spatial operation, for example overlays or area calculations.

Raster data structures

Exhaustive enumeration (figure 2.4) In this data structure every pixel is given a single value, hence there is no compression when many like values are encountered.

Run-length encoding (figure 2.5) This is a raster image compression technique. If a raster contains groups of cells with identical values, run length encoding can compress storage. Instead of storing each cell, each component stores a value and a count of cells with that value. If there is only one cell the storage doubles, but for three or more cells there is a reduction. The longer and more frequent the consecutive values are, the greater the compression that will be achieved. This technique is particularly useful for encoding monochrome images or binary images (Chrisman, 1997).

raster representation

A	A	A	A	0	0	0	0
A	A	A	A	A	0	0	0
A	A	A	A	0	B	0	0
A	A	A	A	0	0	0	0
A	A	A	0	0	0	C	C
0	0	0	0	0	C	0	0
C	C	C	C	C	0	0	0
0	0	0	0	0	0	0	0

pixel	value
1	A
2	A
3	A
4	A
5	0
6	0
7	0
8	0
9	A
10	A
11	A
12	A
13	A
14	0
15	0
16	0
.	.
.	.
.	.
62	0
63	0
64	0

Figure 2.4. Exhaustive representation.

raster representation

A	A	A	A	0	0	0	0
A	A	A	A	A	0	0	0
A	A	A	A	0	B	0	0
A	A	A	A	0	0	0	0
A	A	A	0	0	0	C	C
0	0	0	0	0	C	0	0
C	C	C	C	C	0	0	0
0	0	0	0	0	0	0	0

A,	4	0,	8				
A,	5	0,	8				
A,	4	0,	5	B,	6	0,	8
A,	4	0,	8				
A,	3	0,	6	C,	8		
0,	5	C,	6	0,	8		
C,	5	0,	8				
0,	8						

Figure 2.5. Run-length encoding.

III. EXISTING DIGITAL MAP PROCESS

3.1 Introduction

Digital map is the database which representative of the Earth's surface. Data input is the operation of encoding data for inclusion into a database. The creation of accurate databases is a very important part of digital map process. Data collection, and the maintenance of databases, remains the most expensive and time consuming aspect of setting up a major GIS facility. This typically costs 60-80% of the overall costs of a digital map project.

There are a number of issues which arise when developing a data base for a planning or management projects. The first issue is should the data be stored in vector or raster format. Considerations here include:

- (1) the nature of the source data e.g. it is already in raster form
- (2) the predominant use to which it will be put
- (3) the potential losses that may occur in transition
- (4) storage space (increasingly less important)
- (5) requirements for data sharing with other systems/software

As a general rule it is best to retain the maximum amount of information in the data base. If the data is available as points, lines or polygons then it should be kept that way. If a raster approximation of this data is also needed for analytical purposes then a raster version of the data may be kept in addition to the vector coverage. Many systems provide from quick conversion from vector to raster.

The issue of scale is often raised in relation to GIS data base development. It is important to remember that data stored in a GIS does not have a scale. Sometime people refer to a 1:25000 scale data base. What they mean is that the data has been taken from

1:25000 maps or that it has a level of accuracy which is roughly equivalent to that found on 1:25000 scale maps.

In line with the principle of keeping the most information possible the ideal is to fill the data base with data with accuracies equivalent to very large scale maps. This however may not always be practical as: the data may not be available at very large scale, it may be too expensive or time consuming to digitize from that scale, there may be no envisioned application that requires that accuracy; therefore, compromises are made.

Problems can arise when some of the data in a GIS is very accurate (drawn from large scale mapping – e.g. urban utilities) and other data is drawn from much smaller scale mapping (e.g. soils). In this case great care has to be taken that conclusions are not drawn on the basis of the less reliable data.

There are several methods used for entering spatial data into a GIS, including:

- (1) manual digitizing and scanning of analogue maps
- (2) image data input and conversion to a GIS
- (3) direct data entry including global positioning systems (GPS)
- (4) transfer of data from existing digital sources
- (5) maps: scale, resolution, accuracy

At each stage of data input there should be data verification should occur to ensure that the resulting database is as error free as possible.

Manual digitizing and scanning of analogue maps

The input of data from analogue maps required the conversion of the features into coordinate values.

Digitizing

Digitizing is the transformation of information from analog format, such as a paper map, to digital format, so that it can be stored and displayed with a computer. Digitizing can be manual, semi-automated (automatically recorded while manually following a line), or fully automated (line following).

Manual digitizing involves an operator using a digitizing table (or tablet) (known as heads-down digitizing), or with the operator using a computer screen (heads-up digitizing). The digitizing table has a fine grid of wires embedded in it that acts as a Cartesian coordinate system. The coordinate may be in plane or geographic coordinates. The procedure involves tracing map features in the form of points, lines or polygons with a mouse (puck) which relays the coordinate of each sample point to be stored in the computer. The tablet and puck acting together with the computer can locate the puck position relative to reference information provided by the operator (McGowan, 1998). There are two modes of digitizing: point-mode and stream-mode (see Figures 3.1 and 3.2). The resolution of coordinate data is dependent on mode of digitizing: In point-mode the digitizing operator specifically selects and encodes those points deemed "critical" to represent the geomorphology of the line or significant coordinate pairs. This requires some knowledge about the line representation that will be needed.



Figure 3.1. Point-mode digitizing.

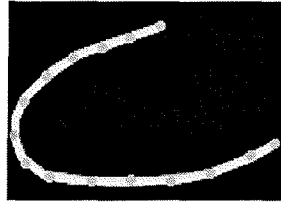


Figure 3.2. Stream-mode digitizing.

In stream-mode the digitizing device automatically selects points on a distance or time-parameter, which generates sometimes an unnecessary high density of coordinate pairs.

On-screen digitizing is an interactive process in which a map is created using previously digitized or scanned information. This method of geocoding is commonly called "heads-up" digitizing because the attention of the user is focused up on the screen, and not on a digitizing tablet. This technique may be used to trace features from a scanned map or image to create new layers or themes. On-screen digitizing may also be employed in an editing session where there is enough information on the screen to accurately add new features without a reference image or map.

The process of on-screen digitizing is similar to conventional digitizing. Rather than using a digitizer and a cursor, the user creates the map layer up on the screen with the mouse and typically with referenced information as a background.

There is always a requirement to transform coordinates from the digitizer system to the real world system (e.g. national map grid).

Digitizing errors will always occur (undershoots, overshoots, triangles).

Editing of digitized features involves error correction, entering missing data, forming topology.

Map registration or Georeferencing

Registration of the map needs to be performed for each new digitizing session, as well as each time the map's position is changed on the digitizer (see Figure3. 3).

This is so that the coordinates of the digitizer can be converted into geographic coordinates. The digitizing program will require the map scale, and the geographic coordinates of the control points which will be used. These control points should generally be well spaced, for example, near the corners of the map. Depending on the software being used a minimum of four points are required. These locations of these points then need to be digitized.

Always use the same control points for each session of a particular map sheet.

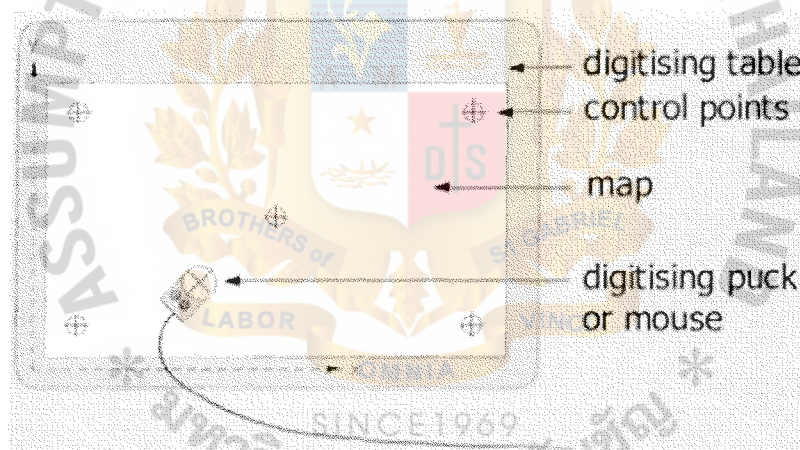


Figure 3.3. The digitizer table and puck.

Some software may require the establishment of the size of the digitizing window by clicking in the lower left corner and upper left corner of the region of interest.

3.2 Current Problem.

Due to the increasing popularity of GPS/GIS application in facilitating people's daily lives, such as road-map using for automobile navigation, the selling of database as maps to user are becoming high complex.

Almost digital maps are too expensive because digital maps were often specific to the needs of particular projects and were not intended to meet the needs of a broader range of users. It was often very difficult to share and transfer data. Users recognized that much time and money was being wasted when datasets could not be shared among a broader clientele.

Currently, with Internet era the digital data 'revolution' also means that users must often search for materials in different places. To acquire some digital sources like digital map, users must contact the producers directly to gain the necessary data in a compatible format. The Internet and Worldwide Web are being used to distribute data to a greater extent by many organizations, and individual user. Therefore, extended channel to communicate and exchange digital maps via internet network might increase efficiency and effectiveness of using map.

3.3 System Environment of MAPSERVER

Web mapping is the concept of displaying maps in a Web browser that are generated dynamically by a map server. Geographic information is stored at the server side and displayed at the client side. So the geographic information has to be transferred somehow from server to client. There are basically two methods to transfer this information: as vectors or as bitmaps.

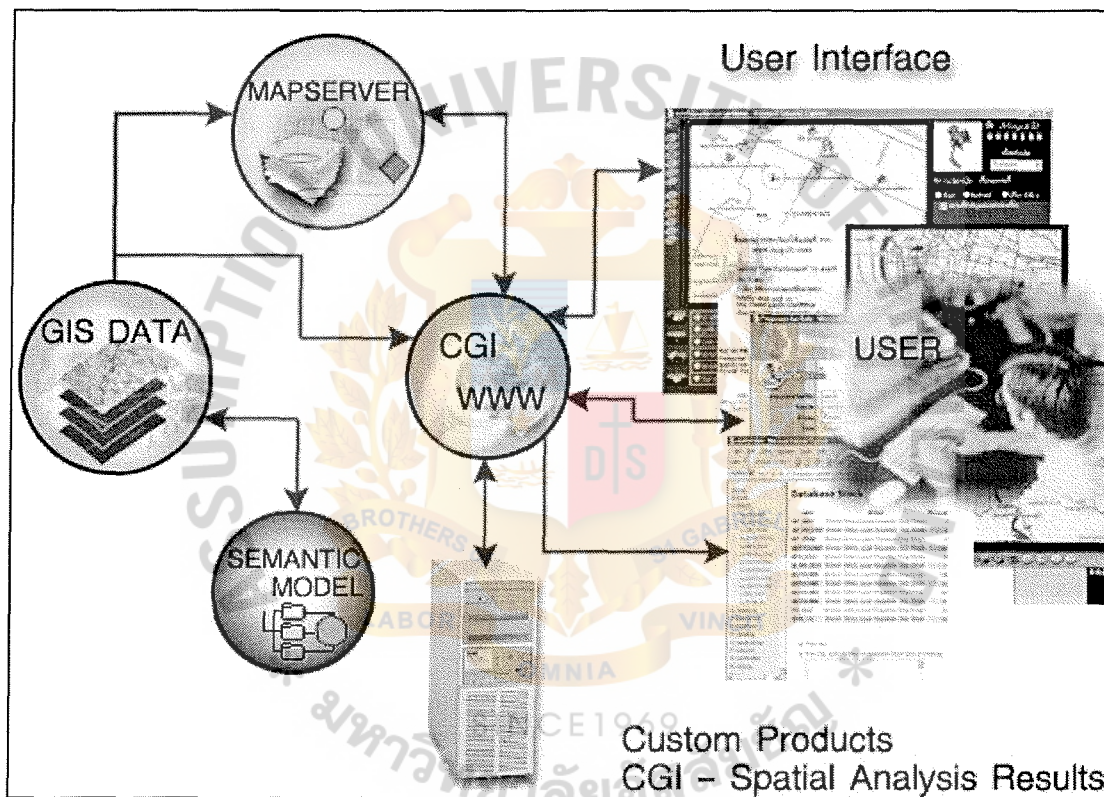


Figure 3.4. System of Mapserver.

If information is transferred in vector form, the client, of course, receives vectors. The client can generate a map from those vectors. If the user zooms into the map then a new map can be displayed immediately and without network traffic, because the client can generate new maps from its vectors. The time for downloading vectors can become

huge with large databases. There used to be no standard way for clients to display vectors. Clients must be intelligent: they must know how to zoom in, calculate positions, store coordinates and combine map layers. As HTML is not capable of doing this, programmers must use Java, Active-X or a plug-in to use vector graphics, which of course can take some time to download and install.

The second way to display dynamic maps is using bitmap transfers. A map in bitmap form is created at the server side from the underlying geographic information. The bitmap (usually a GIF or a JPG) is transferred from server to client and displayed into the browser. This technology is used quite often. It does not require plug-ins or other extra components, but can be handled by the browser itself. The user can click on the map and the server can generate a new bitmap, which zoomed in at the clicked point. That new bitmap is transferred to the client in the same way.

Both of these technologies have their advantages and disadvantages. As both are dynamic (you can zoom in and zoom out and pan) you can display geographic information in vector forms as well as in bitmap form. The vector case requires more computer power, installation efforts and initial transfer. Bitmaps are displayed immediately but each time when the map changes, it must be regenerated at the server side and be transferred. Both technologies can combine layers from different sources. In case of vector graphics this is obvious; layers can be retrieved from different servers and be displayed overlaying each other. In case of bitmap graphics, maps can be overlaid by transparency

IV. STRATEGIC AND MARKETING ANALYSIS

4.1 Mission

The company's mission is to become a leader in digital map retail business. By providing a wide range of digital map products in the online store. In addition, the website will be continually updated and provide news and information about digital map in order to keep existing customers and make new visitors to come back.

4.2 Short term goals

The company should be a small, but influential Thailand map provider with the help of an informative website.

4.3 Long term goals

The company will be one of the largest online Thailand map providers.

4.4 Market Target

This website is an online destination for tourist, and traveler information and interaction. Our target market is emphasized on Thai consumers and international consumers.

4.5 SWOT Analysis

SWOT analysis is an important element and very effective way in marketing plan. In SWOT analysis is an acronym of Strength and Weakness, which cause from internal factors of business, and the Opportunities and Threats, which cause from external factors of the business. In order to succeed, businesses need to understand what their strengths are and where they are vulnerable. Successful businesses build on their strengths, correct weaknesses and protect against vulnerabilities and threats. Then SWOT analysis will help company to identify and make recommendations about marketing strategy.

Strengths

- (1) Small but unique in targeted segment and service
- (2) Well thought of buyers the targeted customers
- (3) Insulated from strong competitors
- (4) Cost competitive
- (5) Better advertising campaigns-shoot where we want
- (6) Flexible
- (7) Innovative there are still many ways to improve business besides sale
- (8) Management- small team with innovative and creative thinking

Weaknesses

- (1) Lack of experience- the company as a new entrant in the business may lack the experience and knowledge in the operations.
- (2) Financially weak
- (3) Limited capacity
- (4) No market image

Opportunities

- (1) Fast market growth: with Thailand as a fast growing market, our company has a very good chance of capturing sales and creating awareness among the customers.
- (2) Niche attack: our company looks into the need of the customers and can serve to satisfy our customers in a better and more unique way to other competitors.
- (3) Recovery economy: With an expectation of recovery in the economy and people's increasing power of disposable income we expect people to have more spending ability.

- (4) No regulations: There is currently no specified regulations and restrictions for operating in E-business.
- (5) Potential customers: we have a broad alternative markets, everyone could be our potential customer.

Threats

- (1) No bargaining power against suppliers – our company, operating small may find it difficult to establish long term relationship with the suppliers.
- (2) Late entry- it is not easy task to develop recognitions and create attentions among our target customers and differentiate ourselves among the existing competitors that have established for some time.
- (3) Customers' tastes and need might change- there is a possibility of customers shifting demands and tastes.

Value and cost Analysis

Product value

- (1) New convenient channel for buying products and services.
- (2) Customers just only possess mobile phone, PDA that use on daily live, do not need to buy specific equipment like GPS equipment.
- (3) Up-to-date service. Mobile technology is very popular nowadays. Digital map can be further developing and following the new technology.
- (4) Easy to use transaction process. Customers just access to website either via internet or via WAP. The transaction process will finish in a minute
- (5) Convenience: Any mobile device can access to map in anytime and anywhere.

Service value

- (1) Free of charge for information to online customer.

- (2) With short process, the bill will credit to their mobile account at the end of the month.
- (3) Corporate service. By co-operate with the big 3 mobile operators in Thailand which are AIS, DTAC and ORANGE and help them in promoting and providing information for every customer.

Image value

- (1) Advertising. With the firm like TAT, the traveler will informed to use mobile service map while they want to find the best route for travel.
- (2) Creating the event in order to create awareness of Map online service.

Psychic Cost

- (1) Customers may not be sure about the information shown on the mobile screen whether it will be right or wrong information.
- (2) Generally, customers are concerned about payment security and privacy policy.

4.6 Marketing Strategy

The marketing mix is probably the most famous phrase in marketing strategies. There are four parts of marketing strategies, product, price, promotion and place. To be successful in doing business, ThailandMap.com has to plan and generate the effective and efficient marketing plan and strategy as following.

(1) Product

The Thailandmap.com is a direct-to-customer digital map online shop. There are various kinds of digital map product including location map, road map and the other information for tourist. All products are high accuracy and ease of used. Our products are based on trendy style and creative idea, which can be adjusted with many styles of travelers.

Thailandmap online catalogue consists of unique and practical products. Our catalogue comprises five categories of maps such as Province, Bangkok, Sea, Golf and Hotel map. The Map shop online intend to support customer with convenience of online shopping; a complete product catalogue with full detail of map, fine image map, price, stock status, and satisfaction guarantee. The customers who buy map products via our website will be informed the order code which they can check the status of their purchasing items. This can ensure the customers the deliver process within guarantee period.

(2) Price

Price is currently very important on the Internet. Many of the business compete heavily on price. Although the move to e-commerce trading is expected to reduce operating costs, the deliver value as perceived by the customer is not considerably lower.

With the basic of pricing strategy, the company's product price is based on cost plus and volume discount pricing strategies. The volume discount pricing strategy is use to attract the potentials customers. Pricing strategy that decrease price as the quantity purchase increases is designed to persuade customer order more products. This strategy provides not only more profits but also the economy of scale for the company to produce product with maximum capacity.

(3) Promotion

(a) ThailandMap.com plans to use both online and offline advertisement. As a new website, ThailandMap.com would like to create awareness first. We decided to promote the site by registering it with search engines such as lycos.com, yahoo.com, google.com, sanook.com. Moreover, the company plans to participate in the Thai tourism Trade Fair, Thailand Grand Festival. We will distribute our brochures to our target group while the participate activity.

(b) ThailandMap.com will be used to promote website by e-mail and newsletter. The internet and commercial online services of company provides tools to create relationships directly with any number of potential buyers who are interested in company and its products or services. Once a site visitor has registered their e-mail address, we will send follow up e-mails to inform that person of site updates and new promotions to encourage repeat visits.

(4) Place

ThailandMap.com is a cyber marketing business using reaction indirect marketing. By nature of our business that provides service to customer at anyplace and any time, which can be reached by mobile. We did not have the actual store so the only place we can communicate with our customer is on internet. Since our business is base on personal selling and information service, location is not strategically importance. However, there is a strong need for image of the company to the customer. We may boost our reliability by giving customers name and telephone number for rush contact.

V. WEBSITE DEVELOPMENT.

5.1 Purpose of the web

In order to create a successful online store, we have to implement website according to a rule of conduct as follows:

- (1) User –friendly interface. Menu bars and links should be easy to access.
- (2) Total information. Information on each map should be complete and high accuracy for users.
- (3) Attractive website. The website should look attractive as professional design. If users are impressed with the website, they will be back to visit the site later.
- (4) Frequently update. User who shopping online always wants to see news and updated information. We plan to update the website every week.
- (5) Secure payment. Most of consumers who buy products online concerning with security payment. We implement SSL to ensure safe shopping for customers.

Website structure.

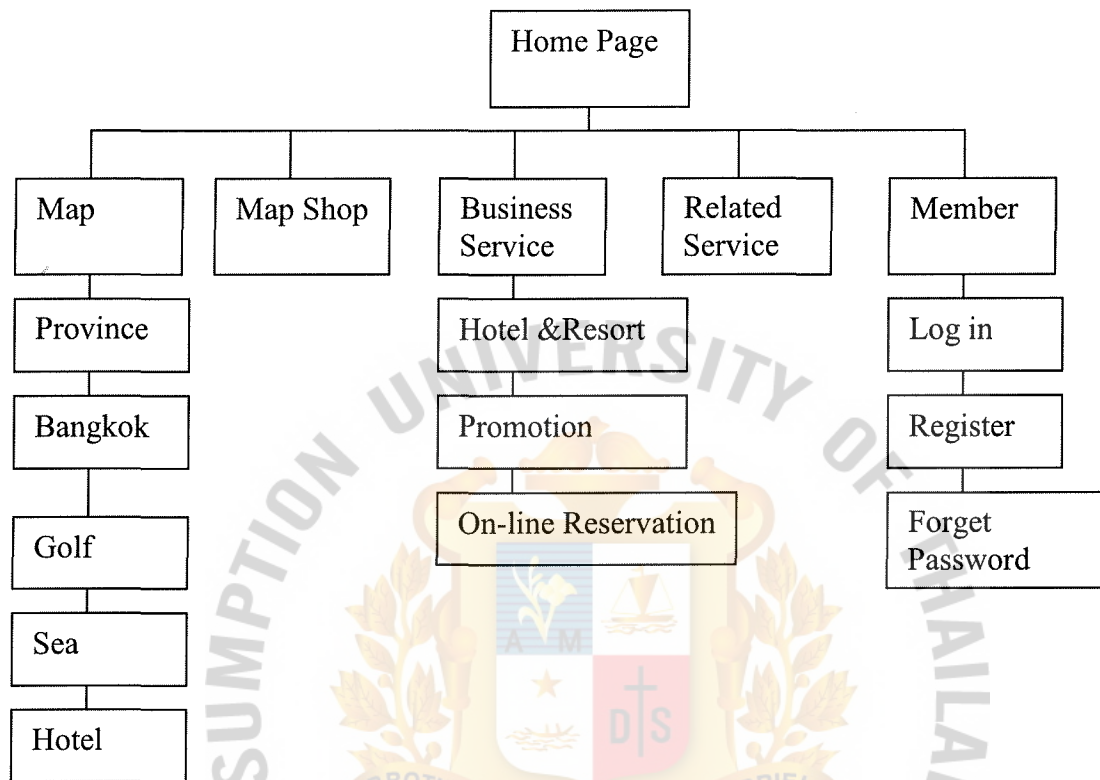


Figure 5.1. Site Map.

5.2 Web design

This web focuses on creating a clear and easy-to-read web for audience. It uses white as the background color, and blue as essential color combined with black text.

The big logo to attract the audience's eyes.

Each of pages divides into four parts.

- (1) Head Logo: Website's Logo
- (2) Navigation Area: This part is at the top of every webpage.
- (3) Left Area: Left part is display sub categories of each page.
- (4) Main Area: It is the main part which shows the details of each page

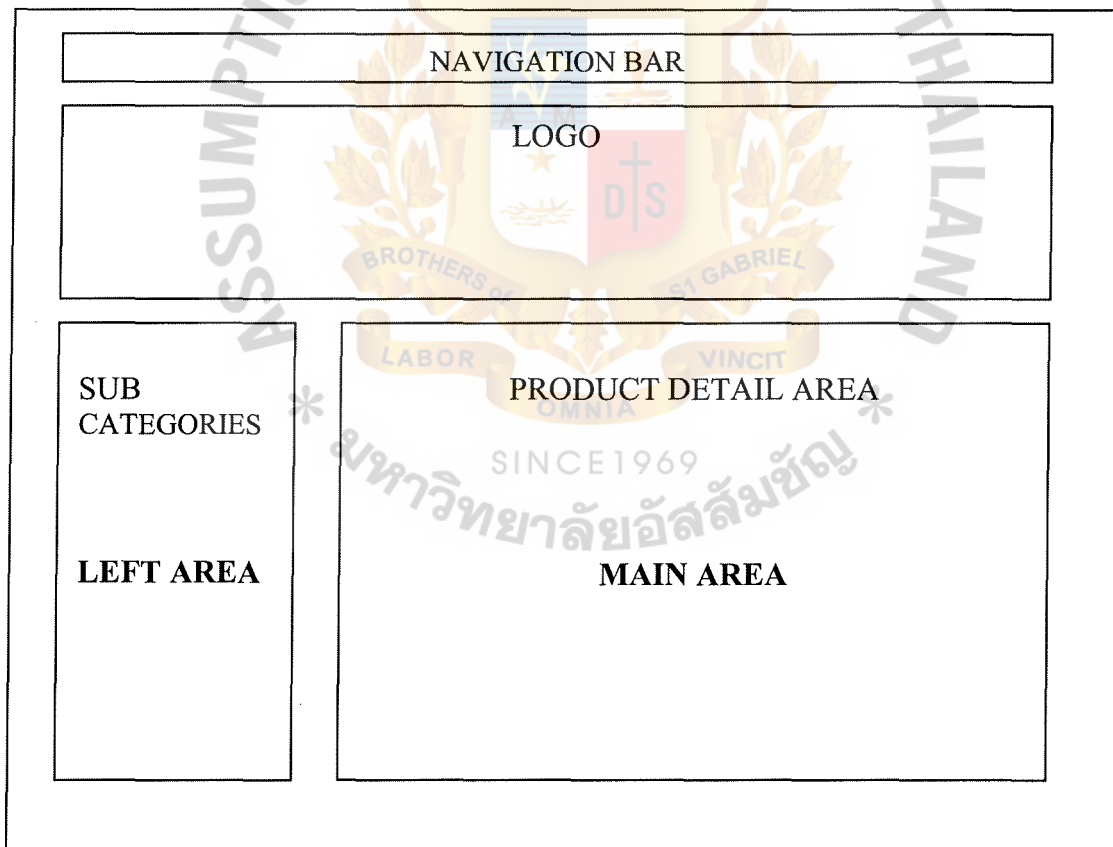


Figure 5.2. Page Area.

5.3 Web Page Layout

This website has four main categories of information. Firstly, Homepage is the gateway to introduction page. Second is Map on mobile for send mapping part to mobile phone. Thirdly, is Map shop which is provide shopping cart to customer who want to purchase products from our website. Fourthly is Member page.

Every page of this website can be linked to each other because of the navigation menu bar which is global link at the top and the last of every page, so that it makes the customer easy to reach the desired page. In order to make it more convenient for customer, the services are listed on the top over logo in every page.



Detail of the web with functional Description

Home Page

The home page as default page is the first page that visitor will be attracting. The summary of products and services will be displayed on this page to attract customers' attention. The shop's logo will be displayed on the top of the left corner to make customer recognize the shop's brand at all time.



Figure 5.3. Home page.

Map Shop

This page is catalog online that will show paper map for customer who would like to search and find the information about map product. We will post the selling price in this page. Customer can see and order by one click added to cart.

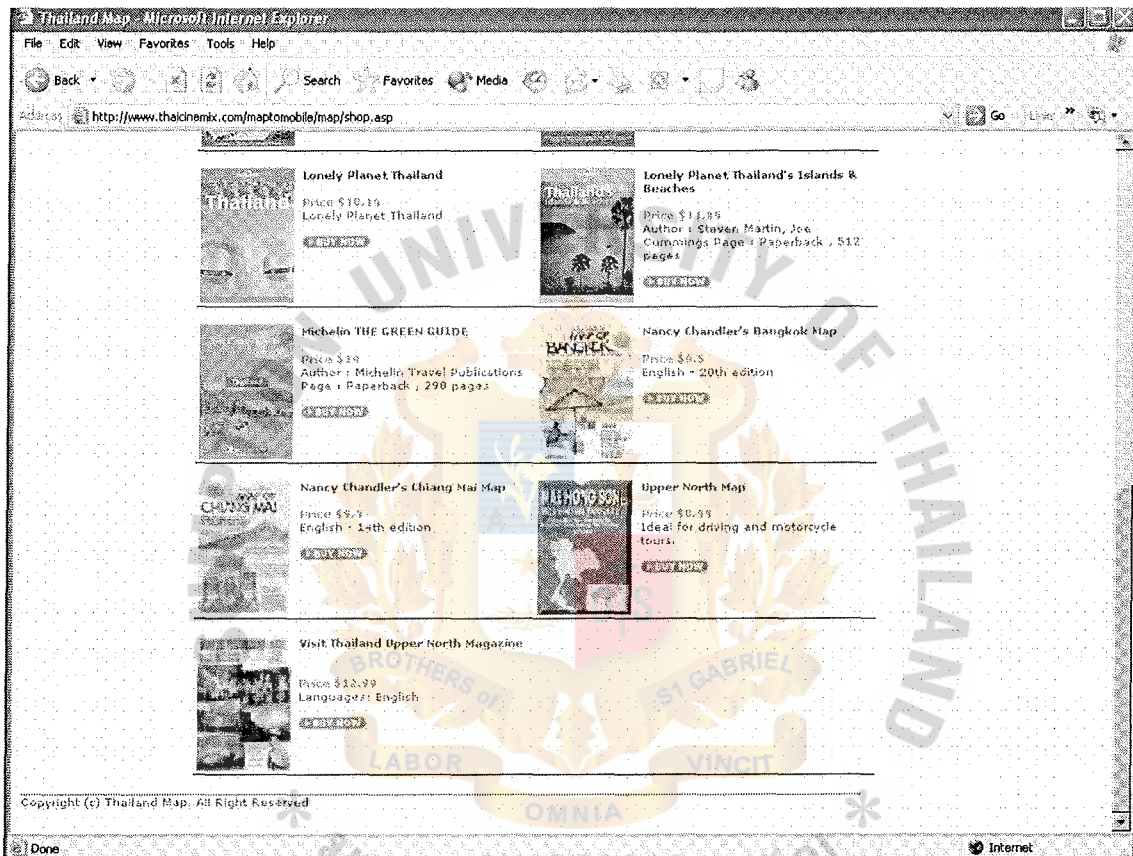


Figure 5.4. Map shop page.

Business Service

ThailandMap has co-operated with hotel business provide room service and on-line reservation through our website. This page will link directly to our partner's website and our member will get special discount rates.

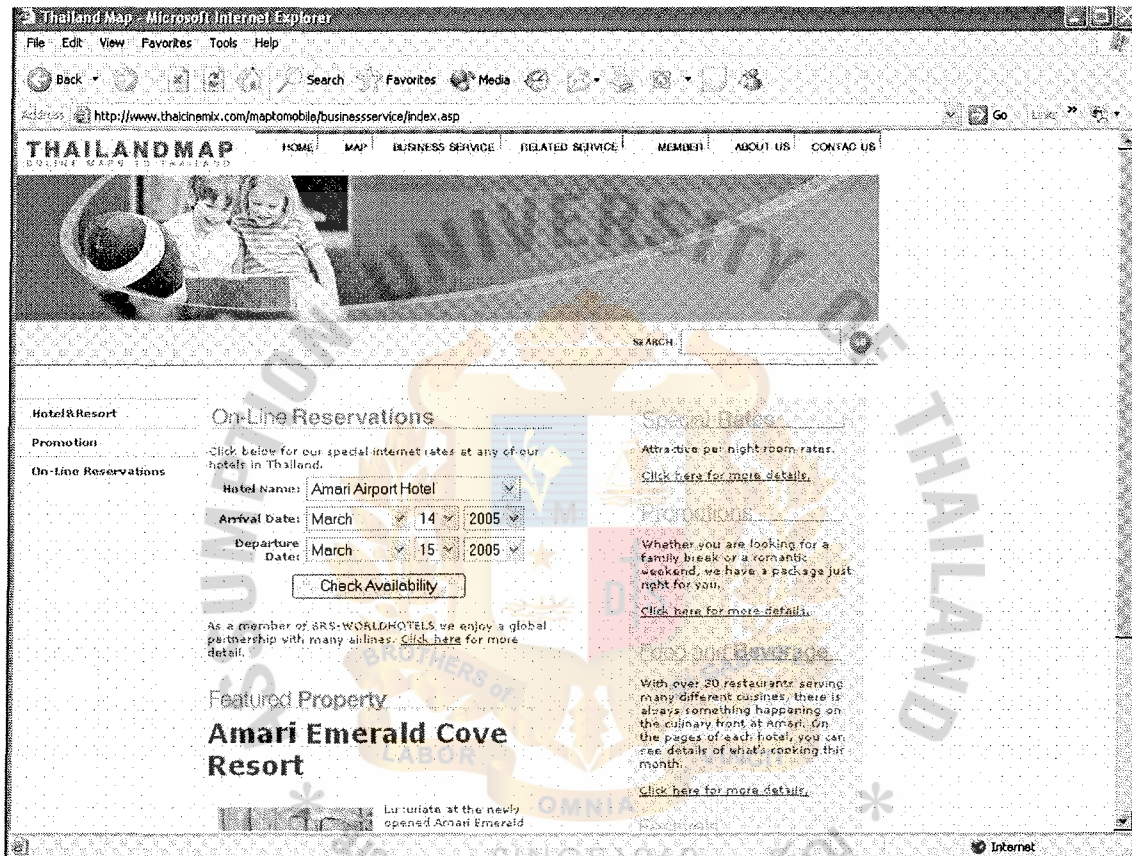


Figure 5.5. Business service page.

Related Service

This page provides useful information for travelers such as domestic airline schedule, Skytrain (Bangkok) Map, Time table. Visitor will searching information and download interested part as well.

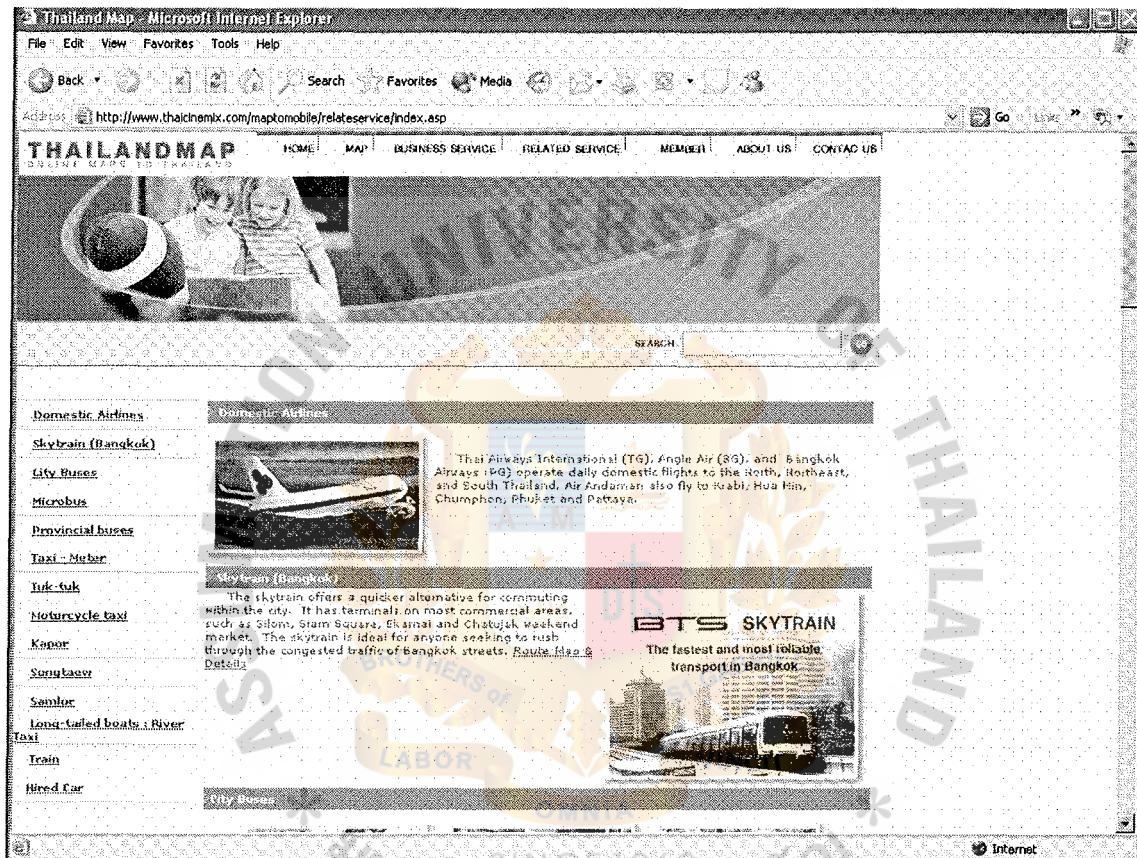


Figure 5.6. Related service and information page.

Register

This page shows input form for member login to Website by key in user name and password of member then press login button.

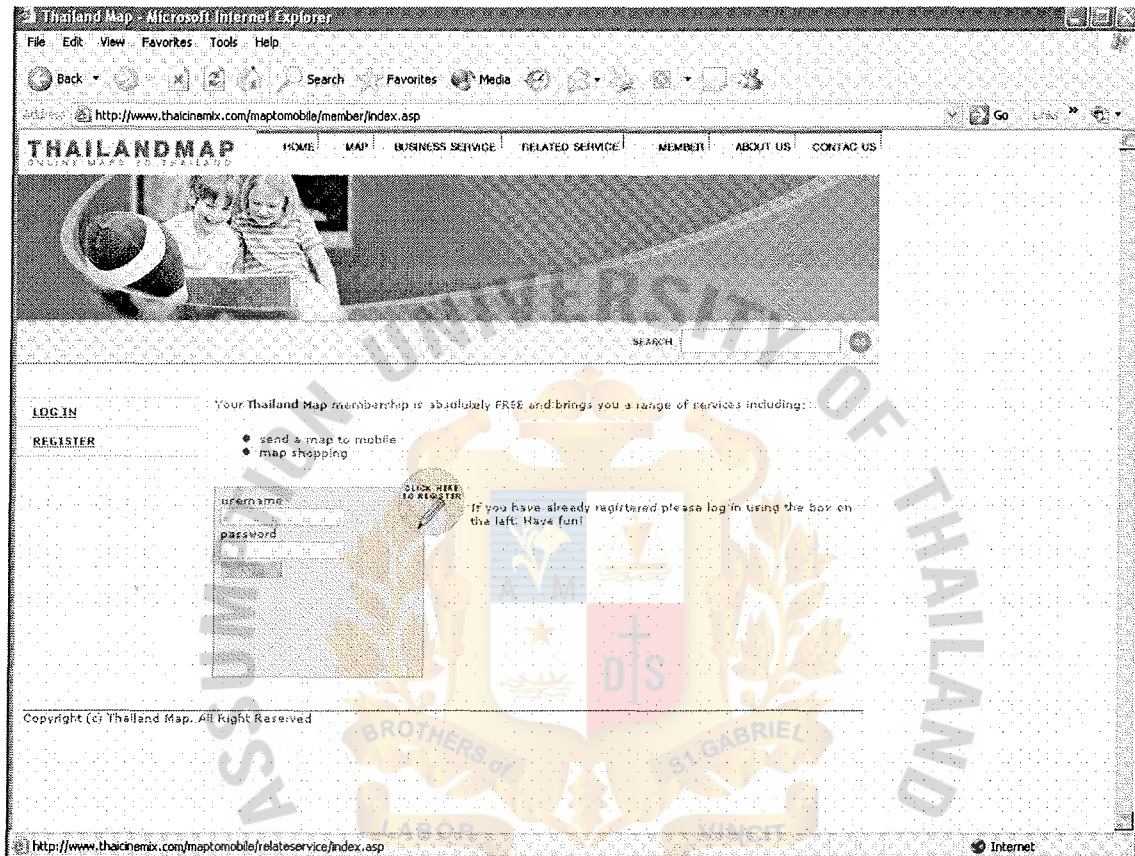


Figure 5.7. Log in page.

Register2

This page requires customer or visitor fill in the form.

The screenshot shows a web browser window titled "Thailand Map - Microsoft Internet Explorer". The address bar displays "http://www.thaicinemix.com/maptomobile/member/register.asp". The website header includes the "THAILANDMAP" logo and navigation links: HOME, MAP, BUSINESS SERVICE, RELATED SERVICE, MEMBER, ABOUT US, and CONTACT US. Below the header is a banner image of two children. A search bar is located below the banner. On the left side, there are links for "LOGIN" and "REGISTER". The main content area contains the following text:

Just fill in the following form and you'll be registered for Member.
Please note: no personal information will be disclosed without your consent.

Asterisk (*) indicates information is required

Create your Member login

email*
(We will send your registration details to this account)

When choosing a username and password please bear in mind that they are both case sensitive and should not contain any spaces!

username*

password*

Verify Password*

The registration form is overlaid on a large, faint watermark of the Assumption University of Thailand logo, which includes the text "ASSUMPTION UNIVERSITY OF THAILAND", "LABOR OMNIA VINCIT", and "SINCE 1969".

Figure 5.8. Register page.

Register3

Thailand Map - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites Media

Address: http://www.thaichemix.com/maptonline/member/register.asp

Go

email*
(We will send your registration details to this account)

When choosing a username and password please bear in mind that they are both case sensitive and should not contain any spaces!

username*

password*

Verify Password*

Your Registration Details

first name* address

last name* Gender

Date of birth 19 Male Female

Phone Number

Thank you for joining Member
I confirm that I have reviewed my information before submitting this form.

Submit Now

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Internet

Figure 5.9. Register page2.

Thailand Map

This page provides full rang map of Thailand. The map divided into four part North Map, Northeast Map, Central Map, and South Map. Visitor use mouse roll over needed area then double click to zooming in that area. On the top of map, visitor can selected sub category such as sea around Thailand, Hotel, and detail of Bangkok to short-cut find interesting information.

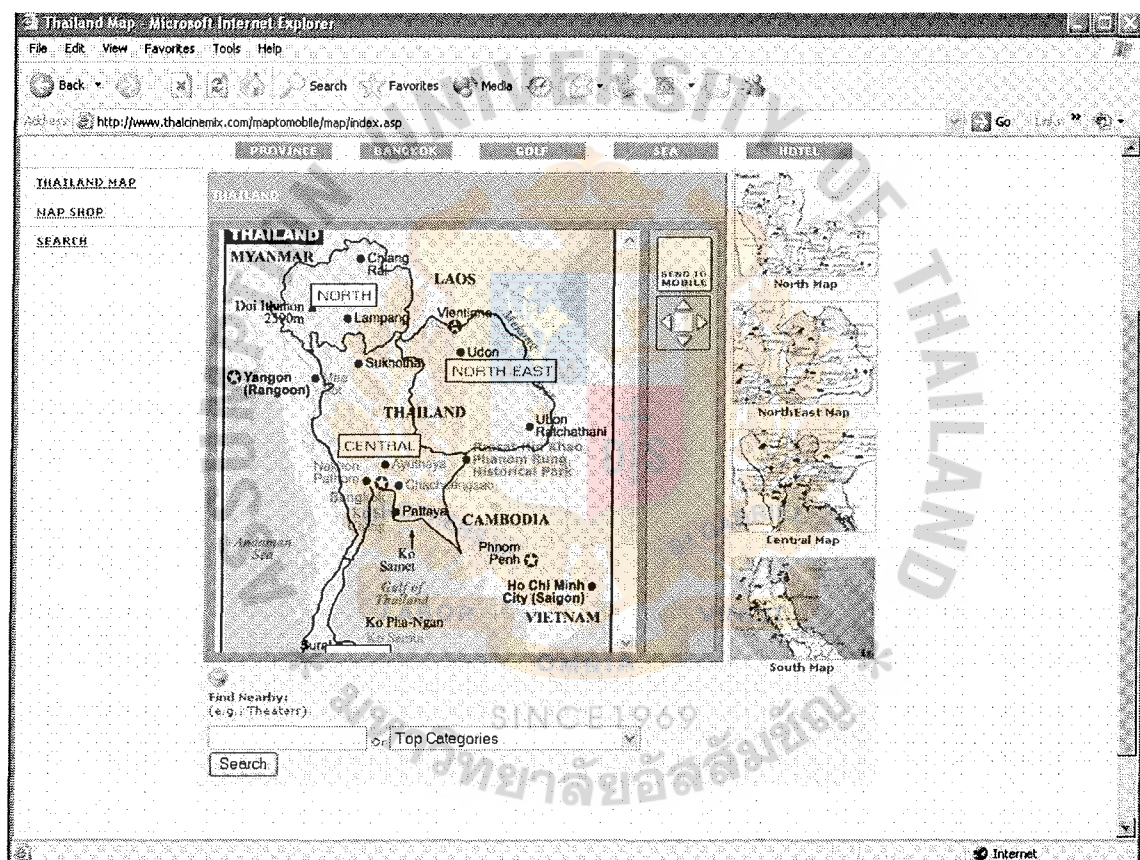


Figure 5.10. Thailand Map page.

Thailand Map

This page is nearby service function which allows customer searching for service within specific categories such as hospital, shopping mall, gas station and many other services. Visitor can find nearby location by key in data, word, or location in the dialog box then click Search button.

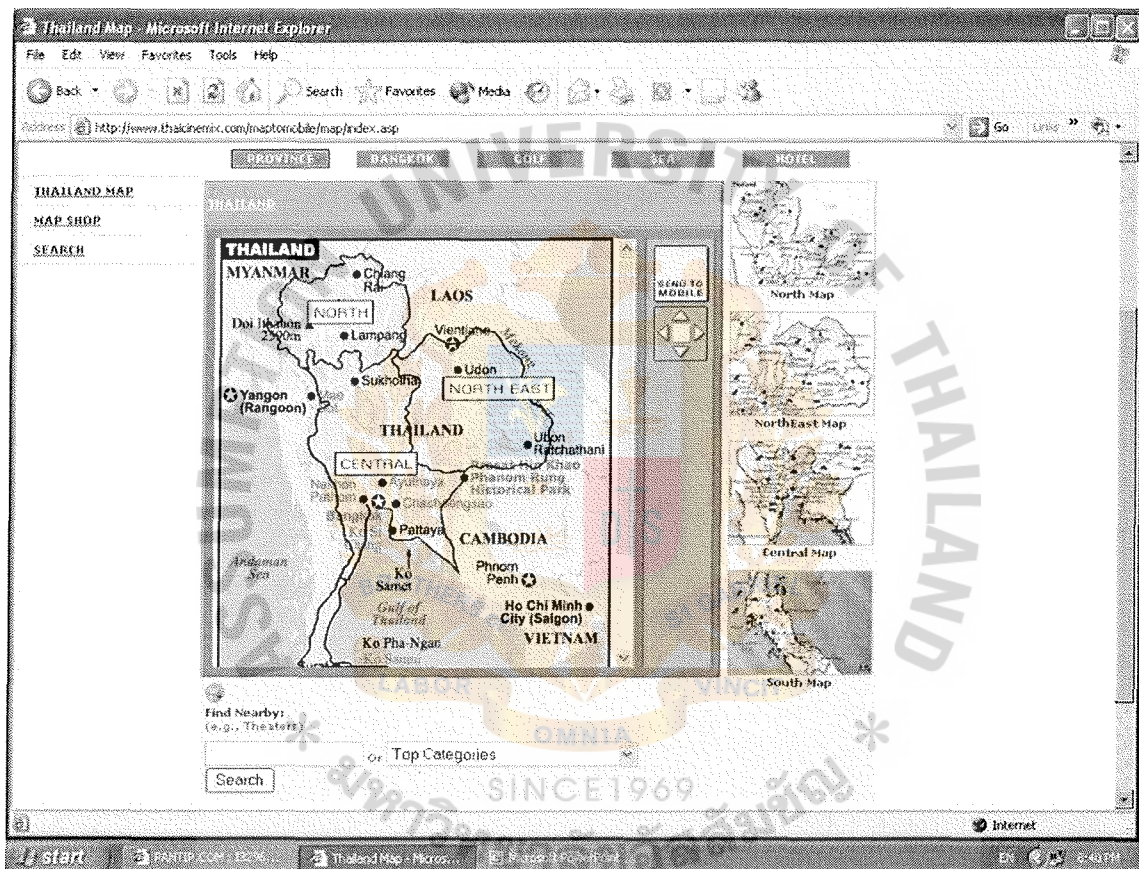


Figure 5.11. Thailand Map (search area).

5.4 Hardware and Software requirements

Establish new website as storefront require both hardware and software as follows.

5.4.1 Hardware requirements

In process of developing the project; there will be both computer server and client. This project is implemented on Internet Information Services, the web server for internet and internet websites. So high performance computer is required to develop proposed system. Hardware specifications are listed in the table below.

Table 5.1. Hardware Specification.

Hardware	Specification
CPU	Pentium IV 2.6 GHZ
Memory	512 Mb.
Hard disk	80 GB.
CD Rom R/W	52X
Monitor	Flat screen 17 inches
Printer	Laser Printer
Scanner	Flat Bed 1200x1200 Dpi

5.4.2 Software specifications.

Software specifications are listed in the table below.

Table 5.2. Software Specification.

Software	Specification
Operating System	Windows XP Professional Edition
Web Server	IIS 5.0 (included with WindowsXP)
Database System	Microsoft office XP access
HTML Editor	HTML kits
Image Editor	Adobe Photoshop 7.0

5.5 Financial Analysis

Cost and Benefit analysis is important for the business setup. To establish the business, ThailandMap.com needs to consider total cost analyses. Return on investment will be calculated by subtracting revenue with integrating capital investment cost as well as pre-operation cost. The annual fixed cost and variable cost every year is included.

Estimated of income per year (Year 1-3)

Estimated income is generated from profit per purchase order and download map to mobile transaction. Profit per transaction is 50 Baht, expected to reach at least 400 transactions per month.

Table 5.3. Estimated Income.

	Year 1	Year 2	Year 3
Sale Target (D/L Transaction per month)	400*12	600*12	800*12
Sale Target (number of D/L Transaction)	4800	7200	9600
Income	1,200,000	1,800,000	2,400,000

Initial investment cost.

The initial investment cost includes computer hardware, software and other related cost.

Details are listed as below.

Table 5.4. Initial investment cost.

Initial investment cost	Cost (Baht)
Computer Hardware (See Table5.1 for detail)	80,000
Software (See Table5.2 for detail)	60,000
Web hosting and internet connection setup	10,000
Miscellaneous	5,000
TOTAL	155,000

Estimated operating Expense

The estimated expended for operating and maintaining the website for the first 3 years are shown below.

Table 5.5. Estimated operating Expense.

Operating expense	Year 1	Year 2	Year 3
Domain name Fee	600	600	600
Web hosting Fee	12,000	12,000	12,000
Advertising Expense	10,000	10,000	10,000
Administrative Expense (salary)	100,000	120,000	140,000
Utility Expenses	50,000	54,000	58,000
Total Expense	172,600	196,600	220,600

Table 5.6. Financial Statement for 3 years planning.

	Year 0	Year 1	Year 2	Year 3
Initial Investment	155,000			
Operating expense				
Domain name Fee		600	600	600
Web hosting Fee		12,000	12,000	12,000
Advertising Expense		10,000	10,000	10,000
Administrative Expense (salary)		120,000	140,000	160,000
Utility Expenses		50,000	54,000	58,000
Total Expense	155,000	192,600	216,600	240,600

Table 5.6. Financial Statement for 3 years planning. (Continued).

Proposed Revenue				
Banner revenue		20000	30000	40000
Sale service Revenue		220,000	330,000	440,000
Total income		240,000	360,000	480,000
Net profit	(155,000)	67,400	163,400	259,400

Break-even analysis

From the financial statement planning, we can plot the graph of Income versus Expense to find break even point. The graph below shows that estimated break-even time is 1 year 3 months.

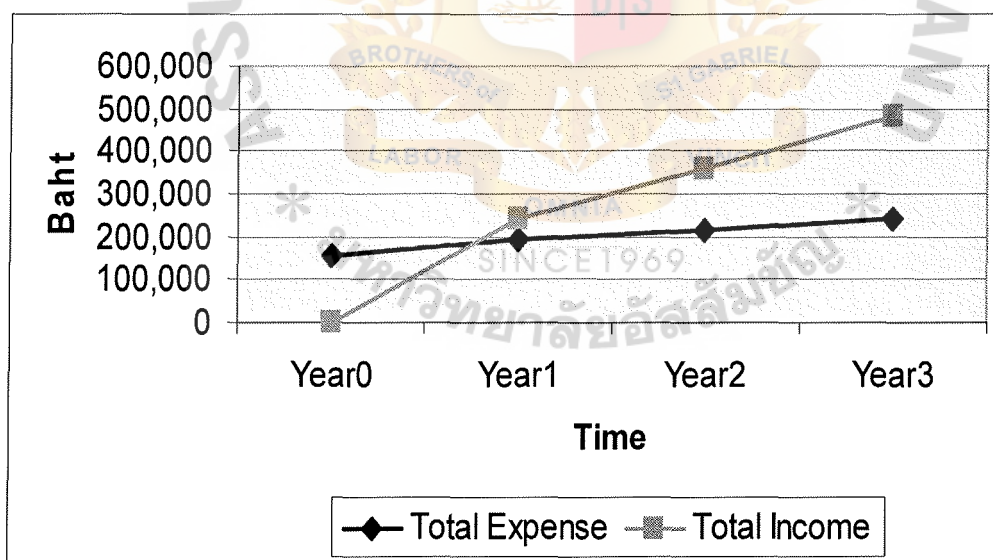


Figure 5.12. Break even analysis.

5.6 Database Design

For ThailandMap.com, a database will need to store customer's information as well as update some map information also. The new customers will have their information about user name and password store in the database.

There are several tables in the database file, detail can be seen as follow.

- (1) Shopping cart table is for storing information about product that customer has added to the shopping cart.
- (2) Map categories table is for storing information about categories and subcategories of Map products.
- (3) Member table is for storing customers' information such as name, address, telephone number and e-mail.
- (4) Order table is for storing orders that customers have bought.
- (5) Product table is for storing products' details.

Contact Table

This table contains data to contact with customer. Database consist of ContactName, ContactEmail, ContactDetail, and ContactDate.

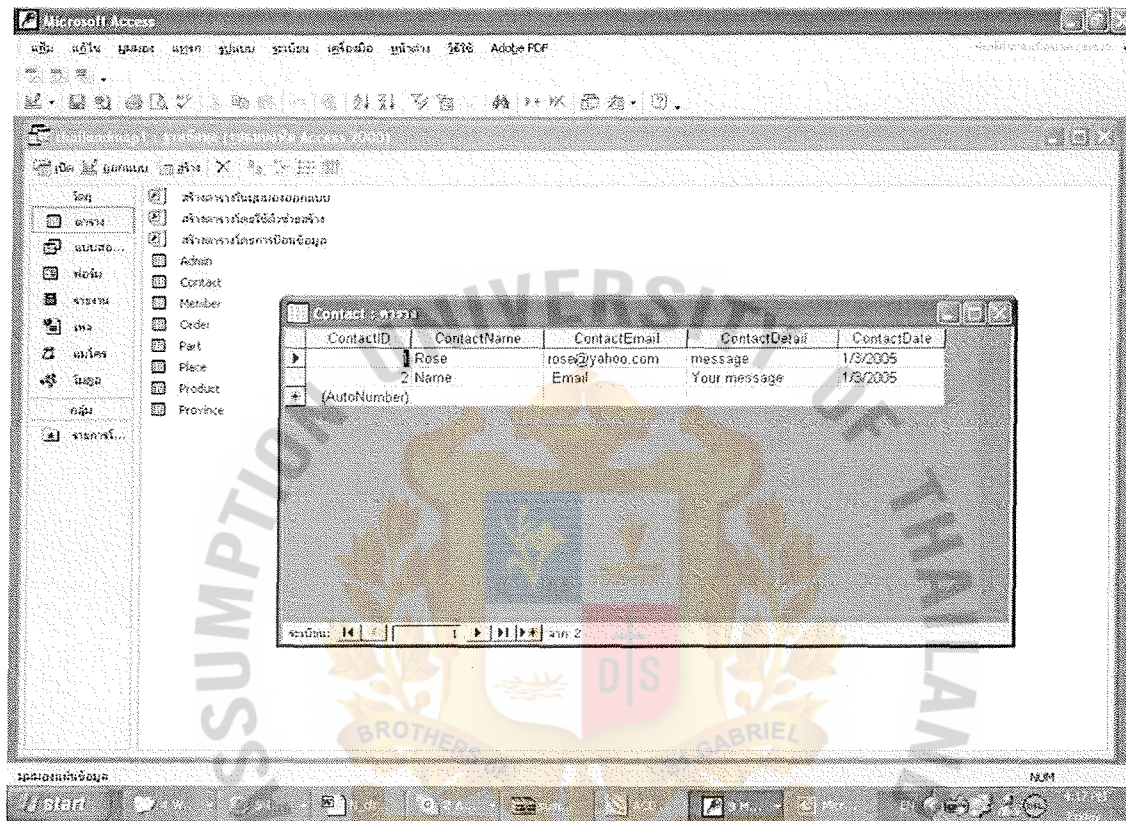


Figure 5.13. Contact table.

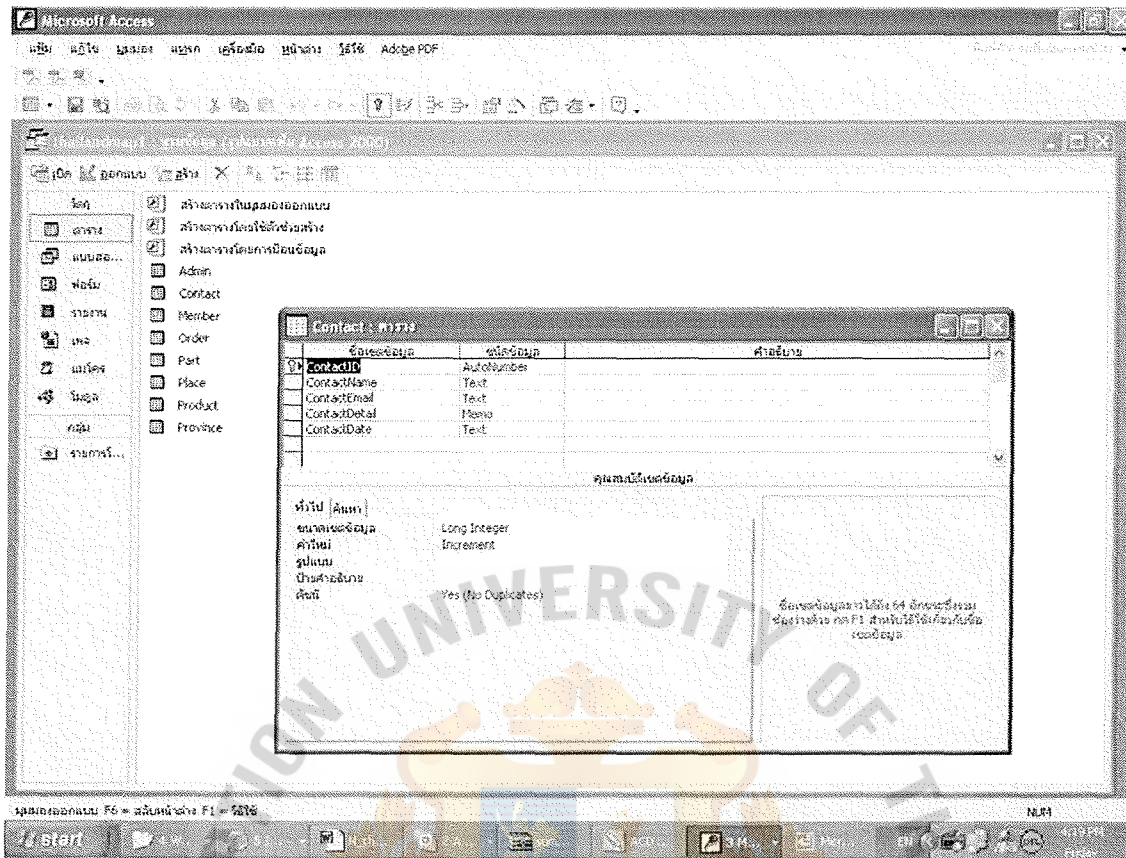
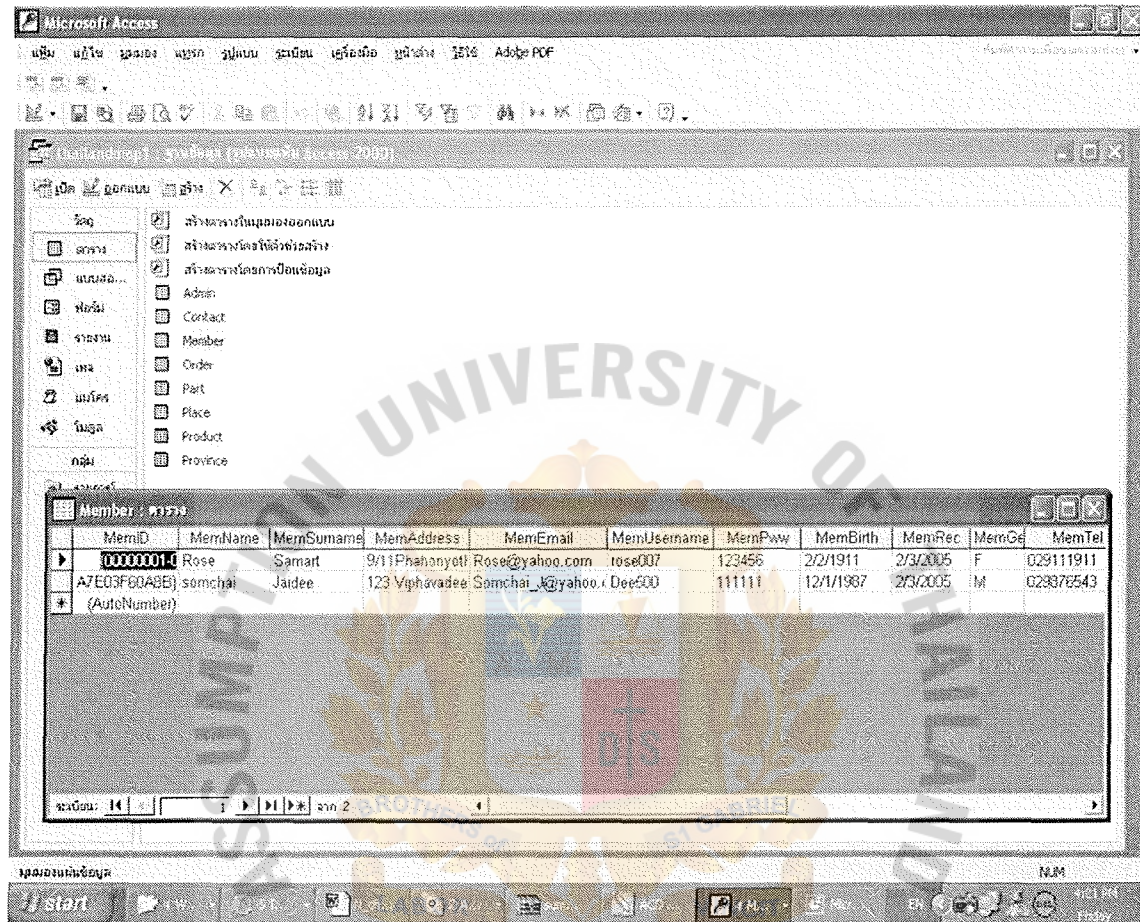


Figure 5.14. Structure view Contact table.

Member Table

This table contains all detail of member.



Microsoft Access

Member : 31373

MemID	MemName	MemSurname	MemAddress	MemEmail	MemUsername	MemPw	MemBirth	MemRec	MemGe	MemTel
00000001	Rose	Samart	9/11Phanayot	Rose@yahoo.com	rose007	123456	2/2/1911	2/3/2005	F	029111911
A7E03F60A8B	somchai	Jaidee	123 Viphavadee	Somchai_k@yahoo	Dee500	111111	12/1/1987	2/3/2005	M	023876543

Figure 5.15. Member Table.

Order Table

This table contain all detail of order transaction. Consist of ProductId, OrderPrice, OrderItem, OrderRecord, OrderStatus.

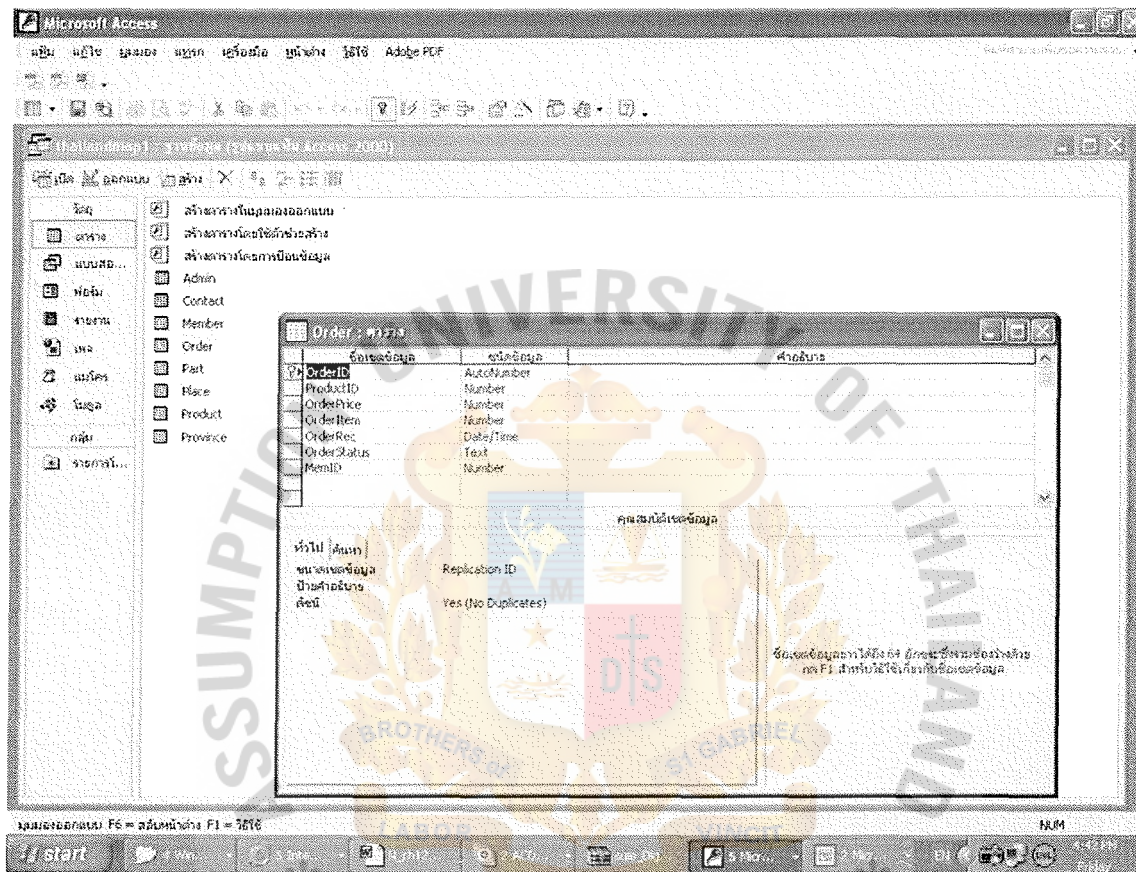


Figure 5.17. Order table.

Part Table

This table contain database to collect sub map categories. Consist of four part such as North, Northeast, Central and South.

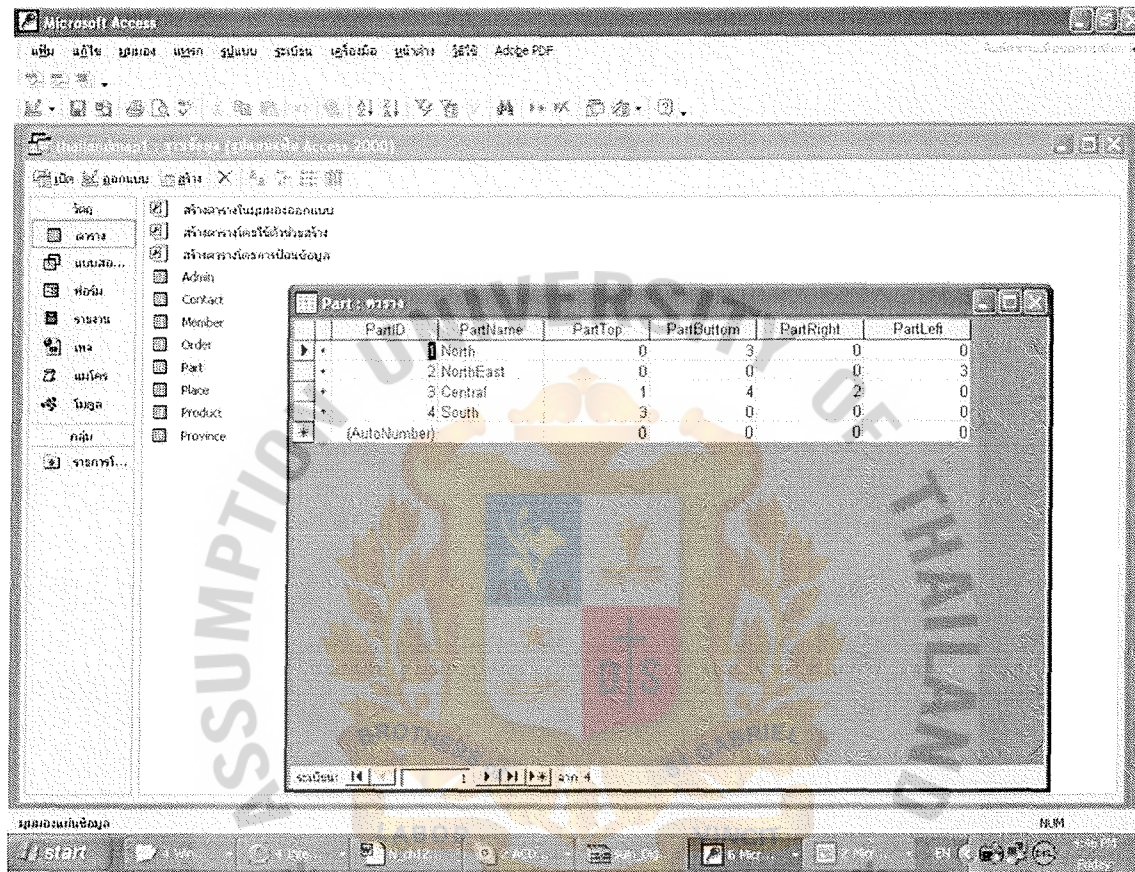


Figure 5.18. Part table.

Place Table

This table contain database of specific place inside each Province map.

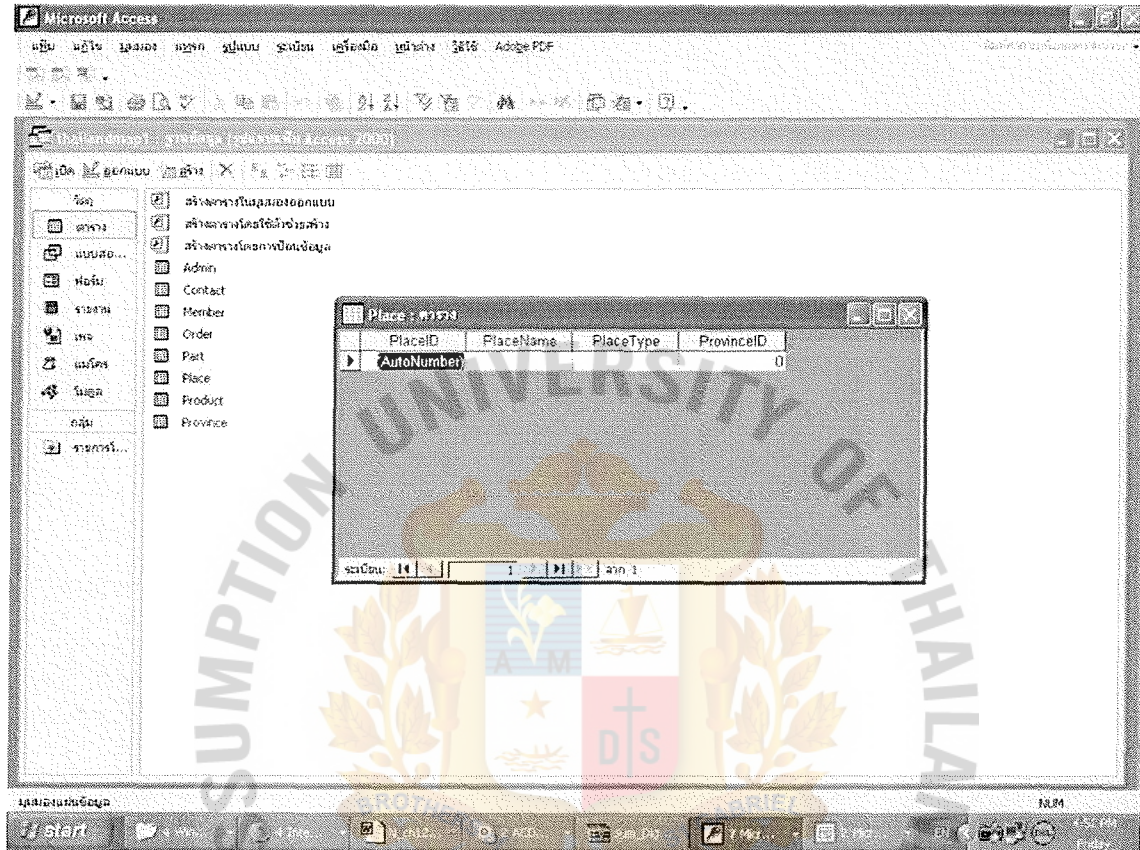


Figure 5.19. Place table.

Table Province

This table contains database for control sub map.

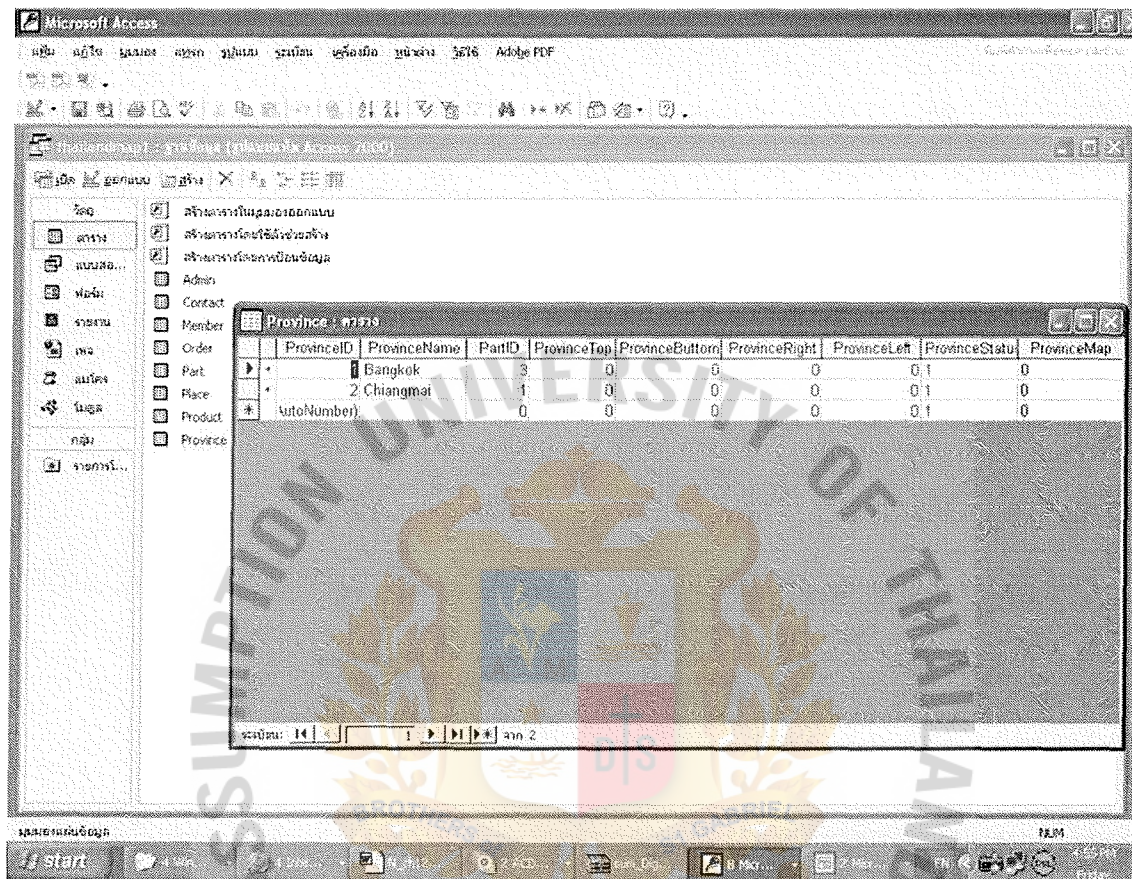


Figure 5.20. Province table.

This table contains all detail of product in the shop. Consist of ProductName, Price of each product, Detail, Notation, ProductItem and ProvideID.

Figure 5.22. Product table.

E-R diagram in Database

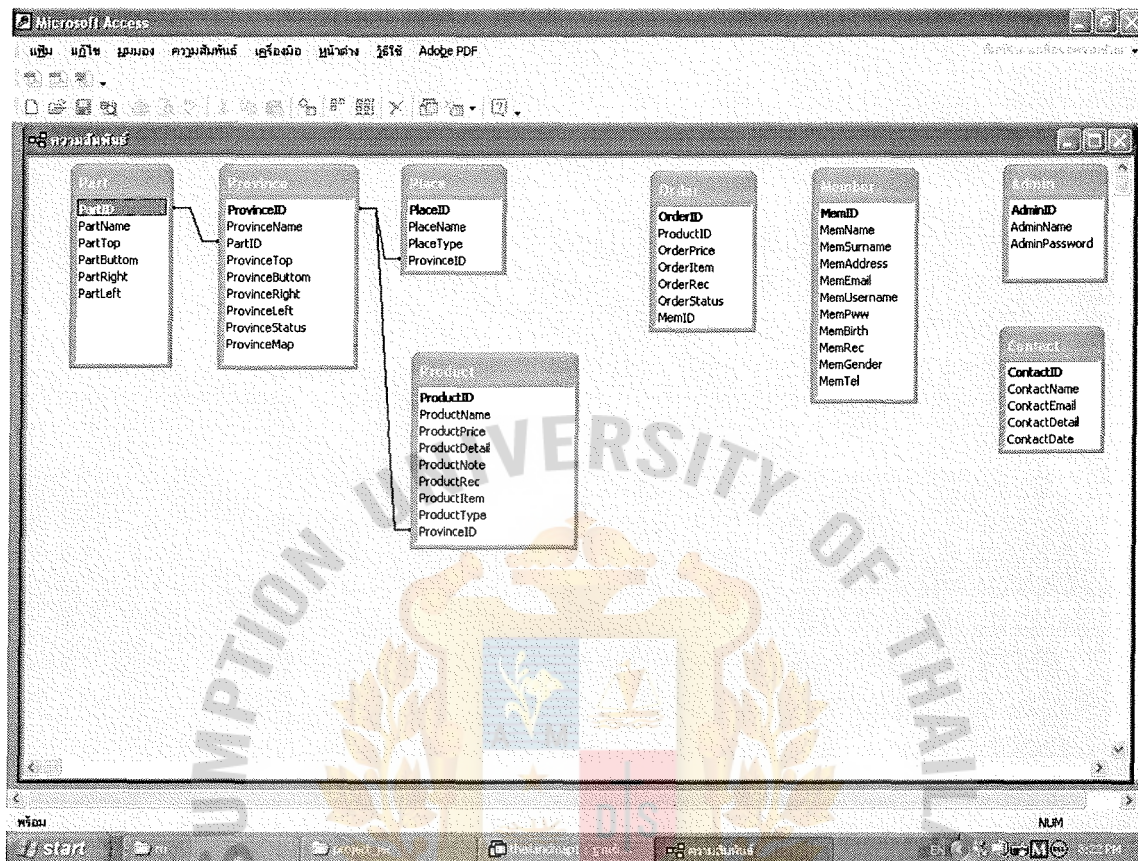


Figure 5.23. Table Relationship.

5.7 Payment method

Payment system is very important that website needs to improve and choose properly to make customer trust the site. Implementation of electronic payment systems is still evolving. Electronic payments are far cheaper than dead-tree method of mailing out paper invoices and processing payments received. Electronic payments can be convenient for customers and saves companies a lot of money.

Credit cards are by far the most popular form of online payments for consumer. A credit card, such as a Visa or MasterCard, has a spending limit based on the user's credit history; a user can pay off the entire credit card balance or pay a minimum amount each billing period. Many consumers already have credit cards, or at least familiar with how they work. Credit cards are widely accepted by merchant. A consumer is protected by and automatic 30 days period in which he or she can dispute an online credit card purchase. However, the entire process must be fully automated on the internet in a secure manner.

For our website, Master card and Visa Card are be used for payment Meanwhile, Service charge form downloading map to mobile phone will be included in the bill of customers automatically.

How to place an order at Mapshop?

Placing an order with Thailandmap.com is easy. Customers already have register to be member with us, so that the benefits of having one make ordering a lot faster and easier.

The process of online shopping

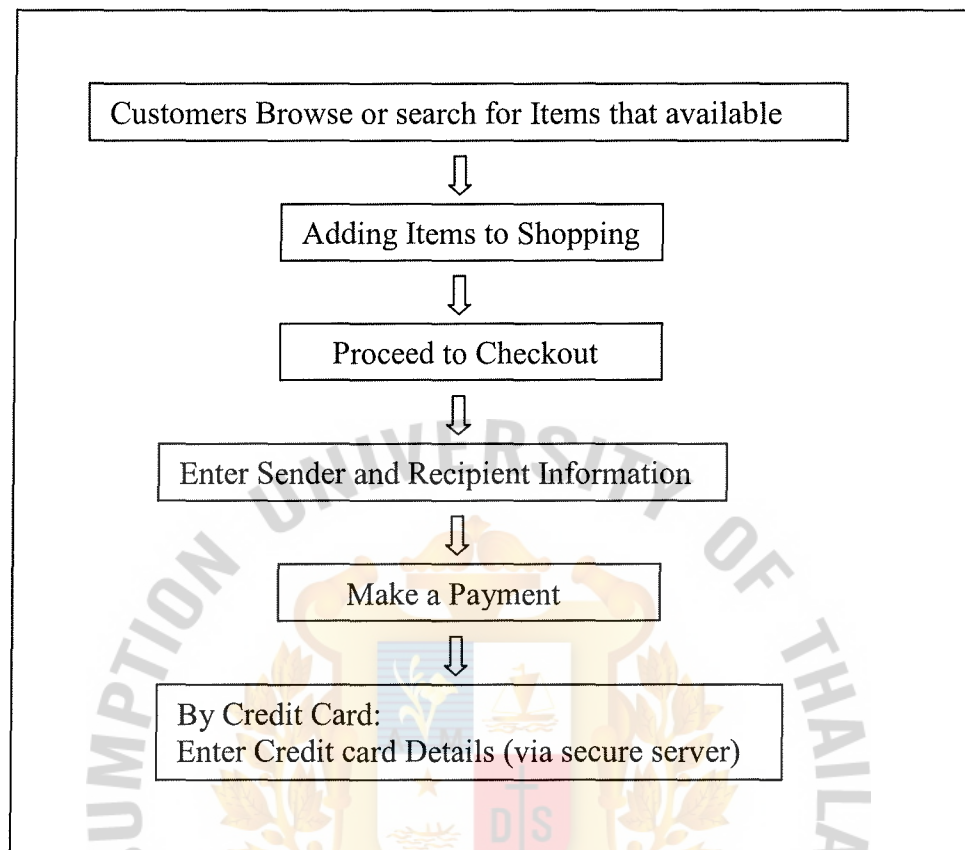


Figure 5.24. The process of online shopping.

Check out process

Step 1:

Customer browses and adds items to shopping cart. Customer can click the Continues Shopping button to add more items until finish. Then customer click Checkout button to proceed next step.

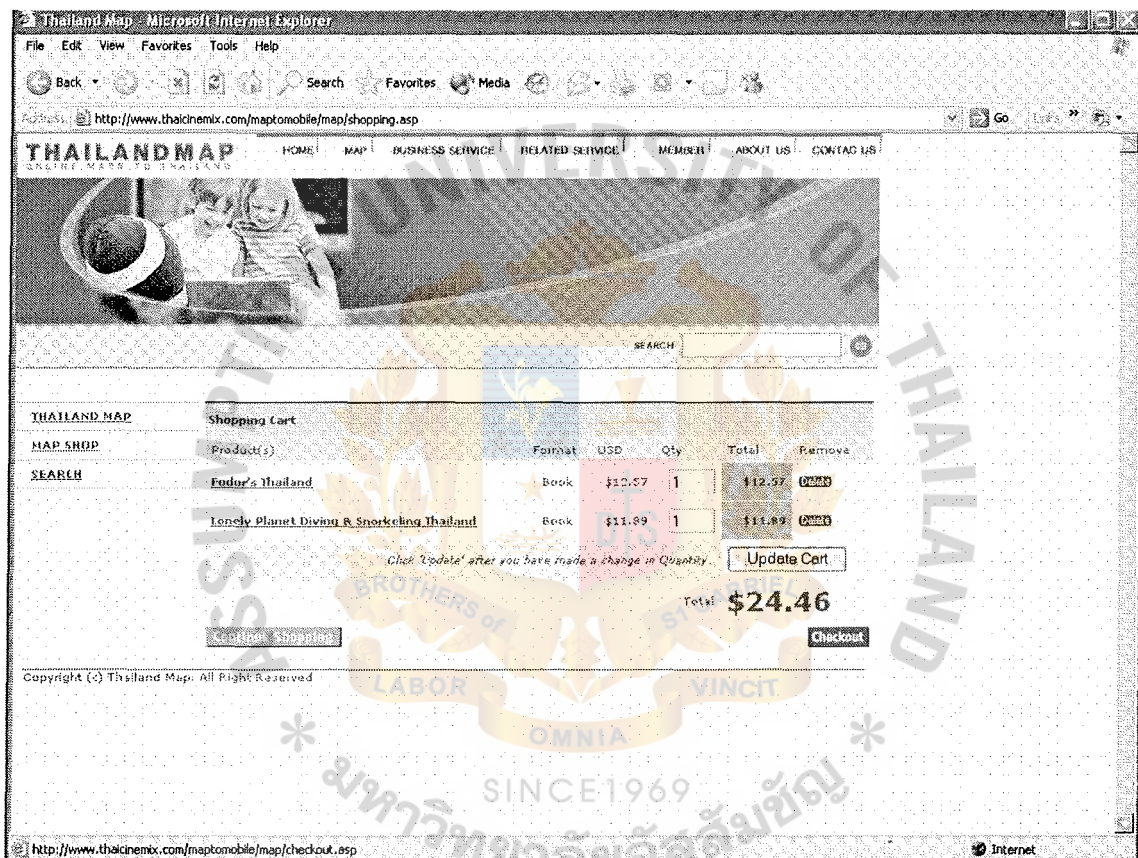


Figure 5.25. Check out process: step1.

Step 2

Customer chooses which type of shipping method and payment detail. In case a customer wants to pay for product by credit card, the credit card number and information need to be entered here. Addition comment from customer to the shop then click ORDER NOW button to submit customer order.

Thailand Map - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Reload Search Favorites Media

Address: <http://www.thaicinemex.com/maptomobile/map/checkout.asp>

Address: 1111 phahonyothin road Bangkok 10100

Email: rungeroon_r@yahoo.com

Phone: 023456789

Shipping Method

☐ Registered Parcel ☒ EMS (+ \$ 8.00) ☐ FedEx/DHL/DPEX (+ \$35.00)

** We mark the price lower and the package as a gift to avoid the delay in customs.

Airtail: 10~20 business days (tracking impossible)

Registered Parcel: 7~14 business days (tracking possible)

EMS/Express Mail Service: 3~10 business days (tracking possible)

FedEx (or DHL): 1~5 business days (tracking possible)

Payment Options

Card Type: VISA (We don't accept AMEX/DINERS now.)

Card Number: (no hyphen)

Exp. Date: 01 / 2005 (Month/Year)

CV Number: (On the back of your card, find the last 3 digits.)

This will be written as 'LG-EOS' (on behalf of 'ASIANDS') in your credit card account.

Notice: We do not accept any kinds of cheques or money order.

Comment or Inquiry

Comment: (If you do not want to receive invoice with your package, please let us know.)

ORDER NOW

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SINCET 1969

Done Internet

Figure 5.25. Check out process: step2.

Step 3:

This page will inform that the order has been fulfilled.

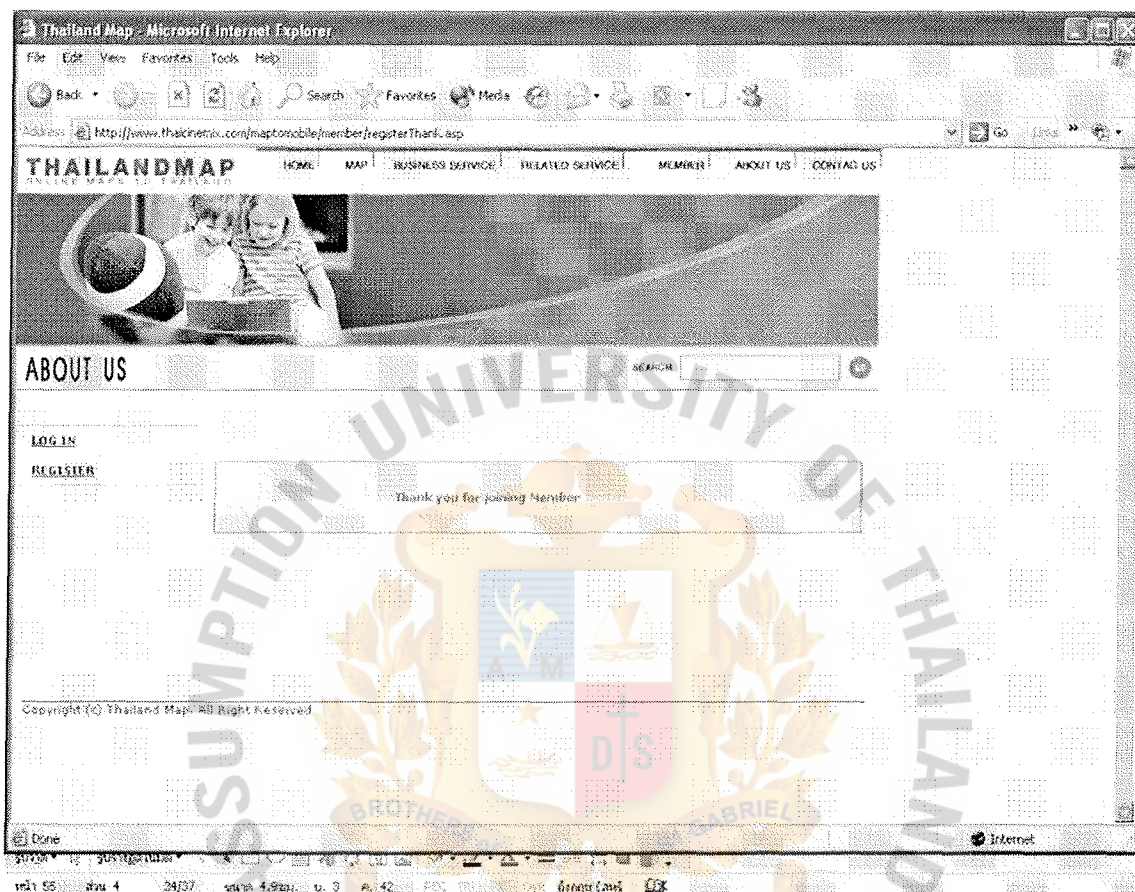


Figure 5.26. Check out process: Step 3.

VI. CONCLUTION AND RECOMMENDATION

6.1 Conclusion

ThailandMap.com is developed to be a new channel to sale map online shop. The website offers a convenient online shopping system for customers. It will provide latest Thailand map version. Visitor can easily search wide-range location in Thailand and send map directly to Mobile phone. So that customer can access to the website in anywhere and any time.

ThailandMap creates the front store by using the program of EditPlus, MarcromediaDreamweaver, and ASP (Active Server Page). In the part of back office, company uses Microsoft Access to building company's database. And the ThailandMap website was developed to support secure online purchasing through Secure Socket Layer (SSL) technology.

Web design to attract visitors when access the site. ThailandMap uses blue color, white background framework, and Flash graphic make the site look attractive, colorful and cheerful. Furthermore, the fonts used in the site are standard font type to avoid problems in displaying to any version of computer of the audiences.

The map navigation used a drop-down menu showing lower levels of the classification when the mouse rolls over a particular link.

According to the sale forecast and financial analysis we can expect to recover the investment in this project for the period of 2 years and 3 months.

In order to succeed in e-commerce market, we have to analyze ourselves and market. We have decided to use SWOT analysis to know our strength, weaknesses, - opportunities, and threat then compare with competitors.

Marketing strategies also are important to implement. To start the online business, advertisement is required. Various offline and online advertisings will be used

to promote the website. We have exchanged link with other well-known website. Many promotion campaigns such as special rate discount for website's member will also be used to keep the existing customers and attract new customers.

6.2 Recommendation

In order to follow the quickly changing environment, we plan to improve our website and system step by step as follows.

- (1) After running the system and website for one year, we will add more capability to our website and make the other put their advertisement for their business also.
- (2) Moreover, we will improve the capability of the website by making it more dynamic website with search engine.
- (3) Webpage and link information have to change frequently in order to attract customer's attention.
- (4) New events and promotions have to be added to the website.

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