



**SEARCH ENGINE OPTMIZATION USING STRUCTURED
KEYWORD FOR THAI E-COMMERCE**

PICHIT SITTHIKUN

**MASTER OF SCIENCE
IN
STRATEGIC MANAGEMENT INFORMATION SYSTEM**

**SCHOOL OF INFORMATION TECHNOLOGY
MAE FAH LUANG UNIVERSITY
2011**

©COPYRIGHT BY MAE FAH LUANG UNIVERSITY

**SEARCH ENGINE OPTMIZATION USING STRUCTURED
KEYWORD FOR THAI E-COMMERCE**

PICHIT SITTHIKUN



**MASTER OF SCIENCE
IN
STRATEGIC MANAGEMENT INFORMATION SYSTEM**

**SCHOOL OF INFORMATION TECHNOLOGY
MAE FAH LUANG UNIVERSITY
2011**


©COPYRIGHT BY MAE FAH LUANG UNIVERSITY

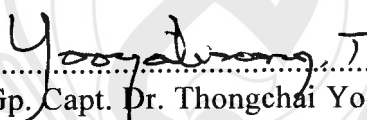
SEARCH ENGINE OPTMIZATION USING STRUCTURED KEYWORD FOR THAI E-COMMERCE


PICHIT SITTHIKUN

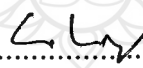
THIS THESIS HAS BEEN APPROVED
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE
IN STRATEGIC MANAGEMENT INFORMATION SYSTEM
2011


THESIS COMMITTEE


.....CHAIRPERSON
(Asst. Prof. Dr. Punnarumol Temdee)


.....ADVISOR
(Asst. Gp. Capt. Dr. Thongchai Yooayativong)


.....CO-ADVISOR
(Assoc. Prof. Dr. Kosin Chamnongthai)


.....EXAMINER
(Prof. Dr. Chidchanok Lursinsap)


.....EXTERNAL EXAMINOR
(Asst. Prof. Dr. Rounsang Chaisricharoen)

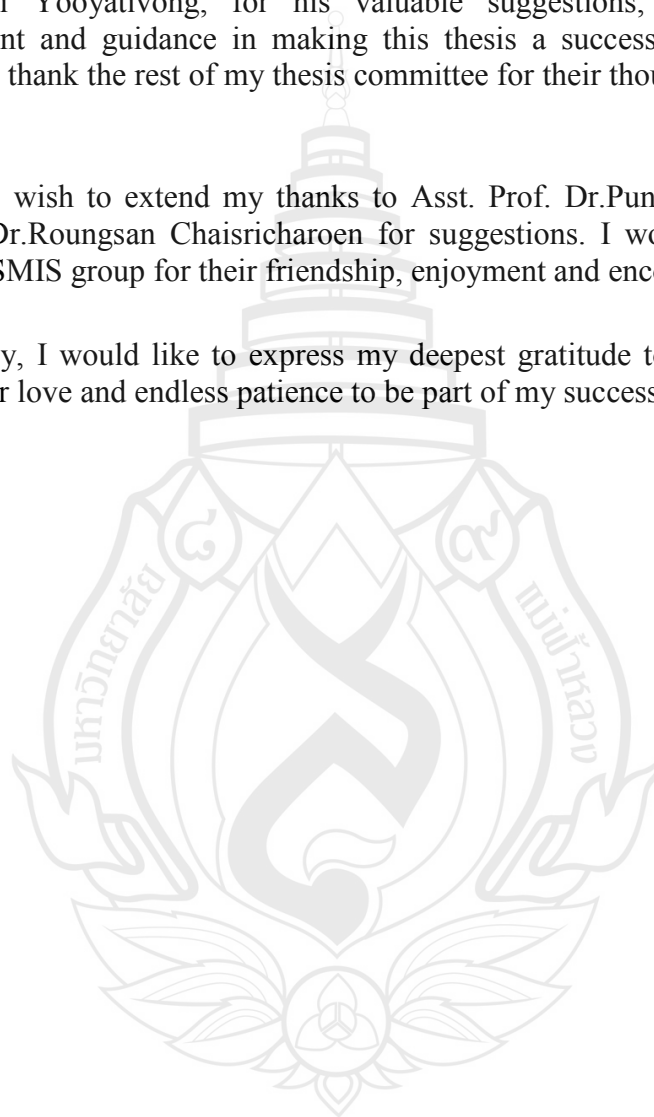
ACKNOWLEDGEMENTS

I would like to express my sincere thanks to my major advisor, Asst. Prof. Gp. Dr.Thongchai Yooyativong, for his valuable suggestions, continuous support, encouragement and guidance in making this thesis a successful one. Moreover, I would like to thank the rest of my thesis committee for their thoughtful comments and suggestions.

I also wish to extend my thanks to Asst. Prof. Dr.Punnarumol Temdee and Asst. Prof. Dr.Roungsan Chaisricharoen for suggestions. I would like to thank all members in SMIS group for their friendship, enjoyment and encouragement.

Finally, I would like to express my deepest gratitude to my parents and my sister for their love and endless patience to be part of my success of this work.

Pichit Sitthikun



Thesis Title	Search Engine Optimization Using Structured Keywords for Thai E-Commerce
Author	Pichit Sitthikun
Degree	Master of Science (Strategic Management Information System)
Advisor	Asst. Prof. Gp. Capt. Dr. Thongchai Yooyativong
Co-Advisor	Assoc. Prof. Dr. Kosin Chamnongthai

ABSTRACT

E-Commerce Marketing for local products is not quite easily operated. It is because the websites uploaded on the internet are needed to be developed and designed for being found by search engine technique which is known widely as Search Engine Optimization (SEO). It might cause difficulty in web searching without SEO technique except that the web site owners have Pay Per Click service or buy advertising. However, these two methods cause a lot of monthly pay. This thesis thus proposes the technique for web site access. The users or owners do not have to develop or use any techniques. They have just input the data of products and services on website, after that the web site will automatically revise its keywords to be found easily by search engine. Our experiment has been carried out with a web site for local product named, Lamduan Fabric. The website is at <http://www.nanfabric.com>. The result shows that the search engine could perform very well and give a satisfaction score at 85%

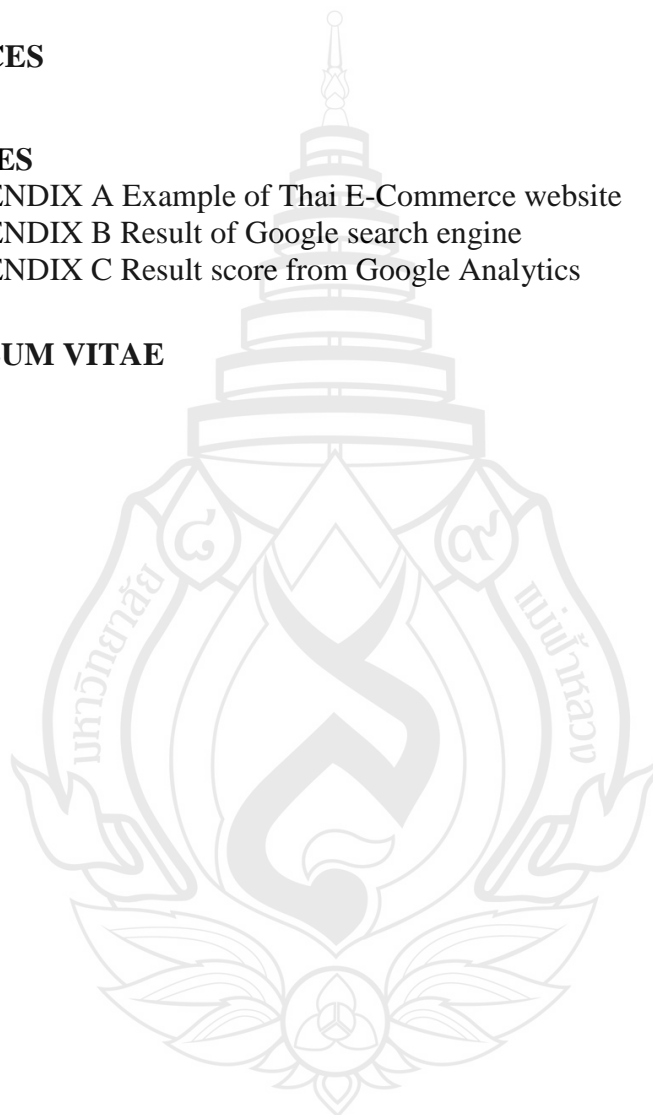
Keywords: Search engine optimization (SEO)/PageRank/Internet marketing

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	(3)
ABSTRACT	(4)
LIST OF TABLES	(7)
LIST OF FIGURES	(8)
 CHAPTER	
1 INTRODUCTION	1
1.1 Principle and Motivation	1
1.2 Objectives	2
1.3 Scopes	2
 2 LITERATURE REVIEW	3
2.1 Related Work	3
2.2 Proposed Method	6
 3 METHODOLOGY	7
3.1 System Framework	7
3.2 Web Implementation	12
 4 EXPERIMENT AND DISCUSSION	16
4.1 Experiment Details	16
4.2 Experimental Results	18
 5 CONCLUSION	21
5.1 Conclusion	21
5.2 Future Work and Suggestion	22

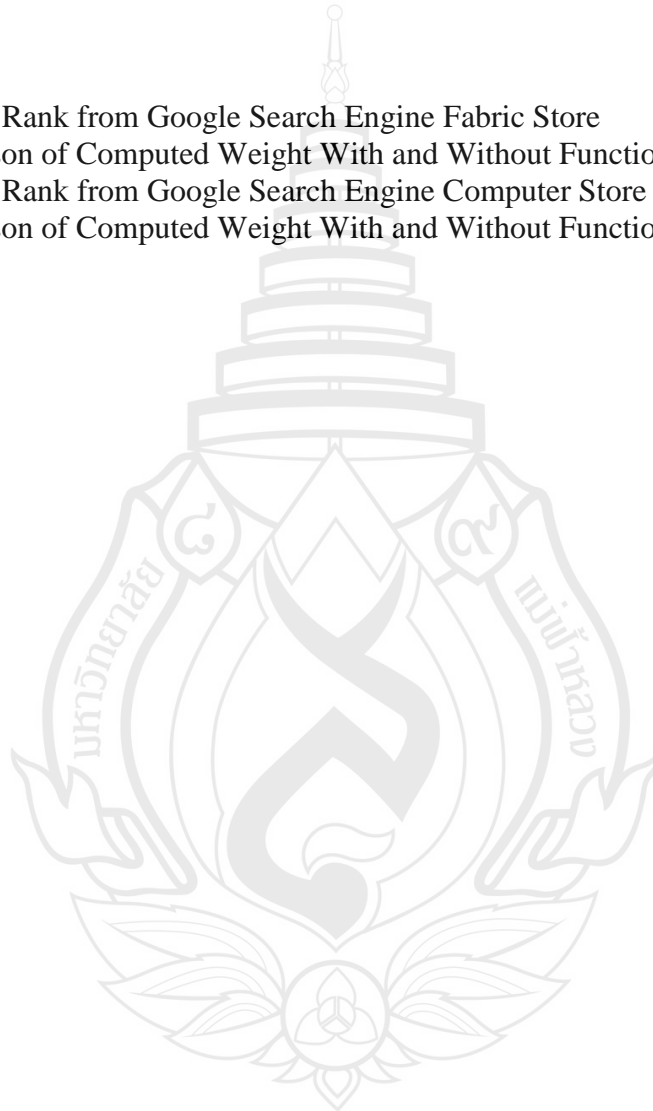
TABLE OF CONTENTS (continued)

CHAPTER	Page
REFERENCES	23
APPENDICES	26
APPENDIX A Example of Thai E-Commerce website	27
APPENDIX B Result of Google search engine	43
APPENDIX C Result score from Google Analytics	54
CURRICULUM VITAE	61



LIST OF TABLES

Table	Page
4.1 Result of Rank from Google Search Engine Fabric Store	18
4.2 Comparison of Computed Weight With and Without Function Fabric Store	19
4.3 Result of Rank from Google Search Engine Computer Store	19
4.4 Comparison of Computed Weight With and Without Function Computer Store	20



LIST OF FIGURES

Figure	Page
2.1 A Pie Graph of Share of Searches in the Year 2010	4
2.2 Sample of XML Sitemap Obtained from Google.com	5
3.1 A Diagram of Research Methodology	8
3.2 A Detail of Webmaster for Google SEO	9
3.3 Define a Title for HTML Document	10
3.4 Define a H1 to H6 for HTML Document	10
3.5 A Detail of Adding website to Google	12
3.6 A Part of Development Code	13
3.7 A Function Split Keyword	14
3.8 A Function to Limit Keyword	14
4.1 A Main Page of Website	16
4.2 Back End of Website	17
4.3 The Evaluation Method in Google Search Engine Using Keyword; "ผ้าพื้นเมืองน่าน"	17
4.4 The Evaluation Method in Google Search Engine Using Keyword; "ผ้า่าน"	18

CHAPTER 1

INTRODUCTION

1.1 Principle and Motivation

Currently, the Internet is very important for business because it provides the easy way of communication both within the company and between the companies. This also helps saving time and the companies' budget. Moreover, most companies use the Internet as a channel for selling products or services offered. Selling products through the Internet enables the company to sell quickly for the products and services are being seen worldwide. Electronics commerce, Nick, is considered as a channel for selling products in the preparation of an effective one channel. Besides, it can be regarded as an important distribution channel because of the ease of service and management. Following the easy-to-follow instructions, customers or buyers can easily browse and purchase the products as needed.

Small Medium Large (SML) business is considered as another important channel of distribution. However, the lack of web site for selling products or services in this business results in poor sales. It is considered that most of a large number of today's web sites are not successful as they should be, because they have not been accessed by people. Moreover, most entrepreneurs do not have knowledge of Search Engine Optimization (SEO). So, they do not see that it could help their businesses to gain more profits.

Therefore, this research offers a way to make e-commerce web sites of companies and agencies to be easily found by the search engine, that is, Google.com. The web site owner does not need to be knowledgeable in this technique at all. The web site owner needs only publishing the information of the products and services to the website. The proposed system will manage and customize the site to be easily found by the search engine automatically using SEO.

1.2 Objectives

The purpose of this thesis is to design and develop the way to help finding E-Commerce website easily by Search Engine (Google.com), where users do not need to have knowledge of SEO (Search Engine Optimization), because it is processed by the system. Besides, another aim of the research is to manage the site to have more chance to be discovered. Most importantly, the definition of the top-ranked web sites is any web sites that are in the first two pages of searching results, which normally shows 10 web sites per page, in this research. This means that the web site in query sequence should be listed within the 20th rank or within the first 2 pages in the searching results.

1.3 Scopes

The proposed system will cover craft and text in Thai. In this study, researchers focus on traditional fabric products from Nan province. Nan is now regarded as the country's major tourist attraction. The products are made and sell at Lamduan fabric store, Amphor Pua, Nan province. The store is said to be the native Amphor Pua style fabric store.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the research in related to the search engine optimization using structured keywords for Thai e-commerce.

2.1 Related Work

Normally, after the web site is created and published to the internet, the web site owners will upload the information of their products or services and customize the layout of their web sites in order to be user-friendly web sites. For example, the layout should be easy for their customers to browse their products and the buying method or shopping cart system, should be easy to follow. More importantly, their web sites should be in a high ranking site to be known to internet society in order to have more chances to increase their sales. The ranking is the output of the search from search engine. It means that there are so many people looking for these web sites because they think these web sites contain the information they need. Therefore, every e-commerce web site wants to be in a high ranking, that is, to be in a first 2 pages of the searching results or be in one of the 20 top web sites from the search. This thesis proposes a method to improve the ranking of the web site based on SEO. There are usually two approaches to improve the ranking. The first approach is to advertise the web site by advertising at well-known web sites or pay for people who visit your site via advertisement, Pay-per Click (PPC). The second approach is to use search engine optimization technique to increase possibility of visits of the web site by telling the search engine to rank the web site into its top rank list.

2.1.1 Reviews on SEO Design Strategy

This section describes the details of the structured keyword for Thai E-commerce system.

A web search engine has been designed purposely to search for information on the World Wide Web, and the search results are presented in a list of results commonly called hits (Liu et al., 2007). Search engines generally utilize a particular set of criteria and algorithms that ranks the search results. Consequently, most web sites have been designed to be easily found by the search engine so that the sites may be listed in the high rank, increasing the possibility of visits from customers. For instance, Google search optimization, which is the most popular search engine, has been recommended as a part of marketing strategy (Yunfeng, 2010).

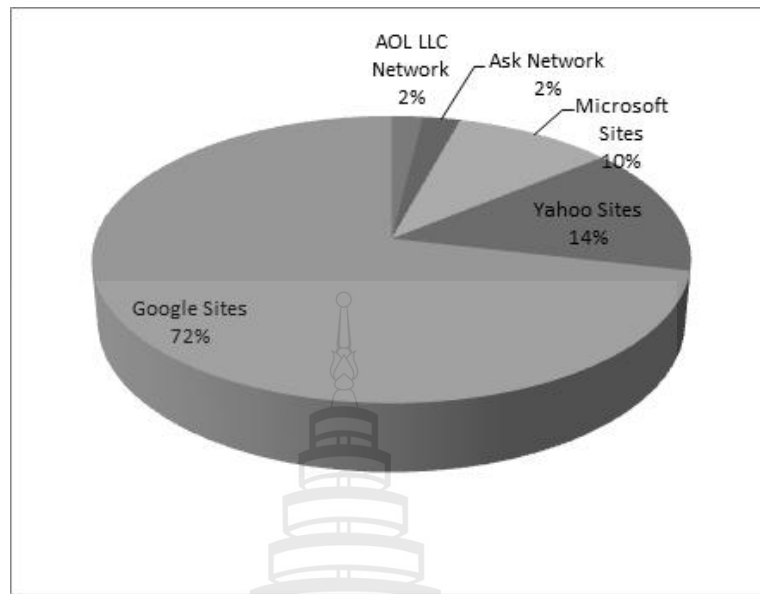


Figure 2.1 A Pie Graph of Share of Searches in the Year 2010.

Figure 2.1 shows the pie graph of share of searches in the year 2010. It is seen in Figure 2.1 that Google search engine has the largest market share of 65% followed by Yahoo search engine, having the market share of 18%. Consequently, the SEO strategy for web sites is relatively significant as reflected from the market share in Figure 2.1 This section summarizes some basic SEO strategies.

First, the page title and keyword optimizations should be concerned as a primary SEO strategy. Generally, the page title, which is often taken as the first line of search results, has the highest priority in search engines. Accordingly, the page title should be concise, eye-catching, and accurately summed contents. In addition, the optimization of appropriate keywords is also another important process in SEO strategy that leads the web sites to be in the high-rank (Enge, Spencer, Fishkin & Stricchiola, 2009). Typically, higher keyword density, which is the ratio between keywords number and webpage words number, results in the closer relevance between the webpage and the keywords meaning the more forward position the page ranked in the search results. Consequently, the web sites should contain keywords as much as possible with an awareness of excessive keywords that may lead risks of registration cancellation (Ledford, 2007; Su, Hu, Kuzmanovic & Koh 2010).

Second, the SEO-friendly web site development is one of the important SEO design strategy. The significant number of communications and planning should primarily be considered in the architecture of SEO-friendly web sites. Such communications and planning include the condition that a search engine finds the sites and the large number of ways in which a web site can be combined together. Furthermore, the content should be indexable in HTML text form. Images, Flash files, Java applets, and other non-text contents are virtually invisible to search engine spiders despite advances in crawling technology (Wu, Chang, Hsu & Lin 2007). Although the simple method to ensure that words and phrases are visible to search

engines is to place the content in the HTML text on the page, more advanced methods have been available for greater demand of formatting or visual display styles (Zhao, Lu & Duan, 2009). For example, images in GIF, JPEG, or PNG formats can be assigned all attributes in HTML, providing search engines with a text description of the visual content. Likewise, images can be shown to visitors as replacements for text by using CSS styles, via a technique called CSS image replacement.

Last, spiderable link structures and site maps should be designed correspondingly to the web sites. The spiderable link structure is an algorithm that the search engine employs for collecting the data from web sites, and consequently web site developers should build a link structure that the spiders can crawl easily (Cui & Hu, 2011; Feridun & Tanner, 2010). The site maps or the structure of all pages in the web site should be designed systematically and can be found easily by the search engine. Nowadays, Google, Yahoo!, and Microsoft all support a protocol known as XML Sitemaps (Liu et al., 2007). Google has firstly announced the XML Sitemaps in the year 2005, and subsequently Yahoo! and Microsoft agreed to support the protocol in the following year, 2006. The use of XML Sitemaps protocol supply the search engines with a list of all the expected URLs for the search engine to crawl and index (Li-Hsing, 2010). Figure 2.2 shows the samples of XML Sitemaps obtained from Google.com, illustrating the XML structure.

```
<?xml version="1.0" encoding="UTF-8"?>
<urlset xmlns="http://google.com/schemas/sitemap/0.84">
  <url>
    <loc>http://www.nanfabric.com/</loc>
    <lastmod>2010-06-03</lastmod>
    <changefreq>monthly</changefreq>
  </url>
</urlset>
```

Figure 2.2 Samples of XML Sitemap Obtained from Google.com

The internet marketing of motel web site in Taiwan developed by using Search Engine Marketing (SEM). AWstates is a free software for bandwidth analysis after developing and publishing to host which is not on the top site, so web site administrator needs to realize the detail of HTML and uses the technique SEO strategies (Joshi & Motwani, 2007; Young & Hsu, 2009) as following:

To modify HTML pages, it should input short description page by page. It is because HTML development must be done in all pages of web site

To add a note for a picture (ALT) : for the detail of web pages of the motel, it should explain and give a detail of facility and show images for attracting the

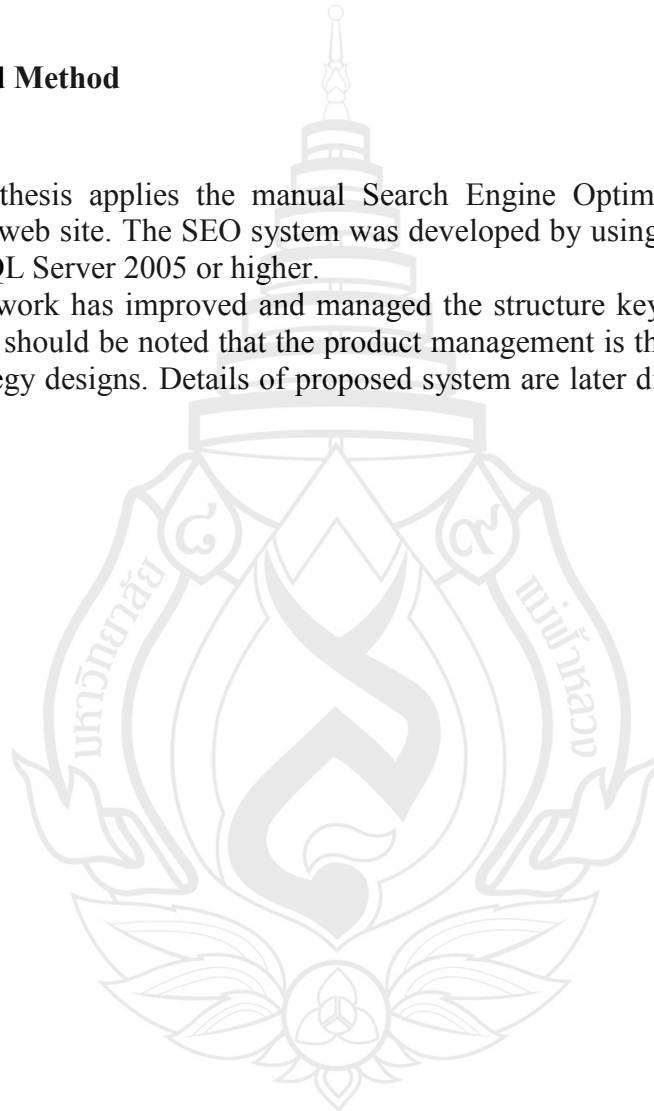
customer attention. The method is to add ALT keyword in the picture and main purpose providing information to searching robot (Wu, 2011).

But, for Thai e-commerce to be found, the important factors to be considered in choosing search engine consist of three factors, namely, Meta Keyword, Meta Descriptions, and Meta Title. The three Meta can improve ranking to top site because it can be tested by choosing one or two meta that the result of ranking is not found in search engine or found in more than pages 50 (10 web site per page).

2.2 Proposed Method

This thesis applies the manual Search Engine Optimization (SEO) to the e-commerce web site. The SEO system was developed by using ASP.NET 4.0 with a Microsoft SQL Server 2005 or higher.

This work has improved and managed the structure keywords of products in each page. It should be noted that the product management is the most important part in SEO strategy designs. Details of proposed system are later discussed in Chapter 3.



CHAPTER 3

METHODOLOGY

This thesis consists of three main phases: the review on SEO (Search Engine Optimization) design strategy phase, system framework phase, and ranking evaluations phase. The more details are in the following subsections.

3.1 System Framework

This section describes details of web implementation and system requirements of SEO for Thai E-Commerce

3.1.1 Web Structure Design

The development of the SEO system has been accomplished based on the software open source e-commerce solution name “nopCommerce” that contains both catalog frontend and administration tool backend. This “nopCommerce” is a fully customizable shopping cart, which is relatively stable and highly usable. For this method we need to design the structure for friendly searching to the search engine. But we have to have source code for the e-commerce system and knowledge of the search engine behaviors first.

The design of web site ensures that web site will have high-quality, correct structure, and clear keyword. Therefore, adhering to webpage design of web standards is the basic of SEO.

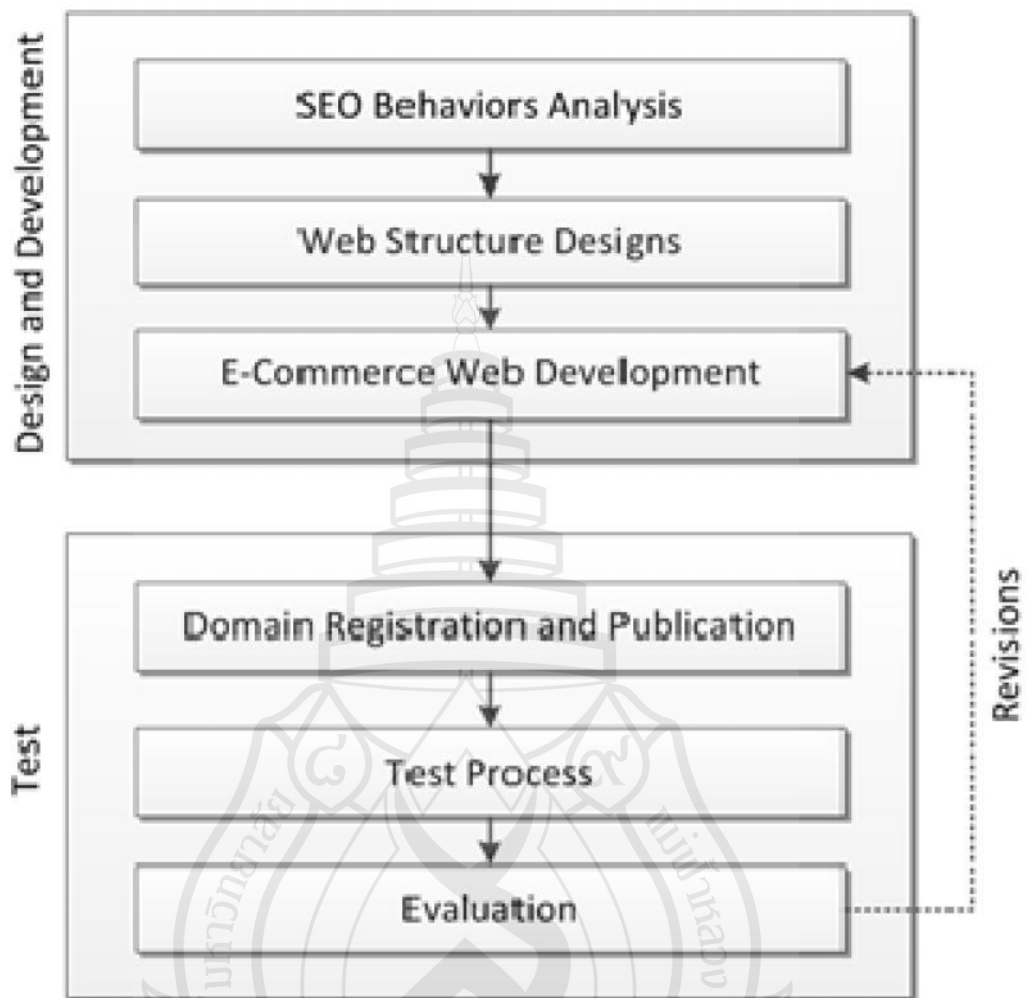


Figure 3.1 A Diagram of Research Methodology

This work has improved and managed the structure keywords of products in each page. It should be noted that the product management is the most important part in SEO strategy designs. The details of each process are explained as follows:

3.1.1.1 SEO Behaviors Analysis

This research gets result of ranking from Google search engine (<http://www.google.co.th>), so before implementing this system we should learn about rule from the Google website on how to make the website be friendly with search engine (<http://support.google.com/webmasters/?hl=en>). If the developer wants to show data from the database after querying the data, the HTML tag Google webmaster tools will explain how to design format to show content in the website.

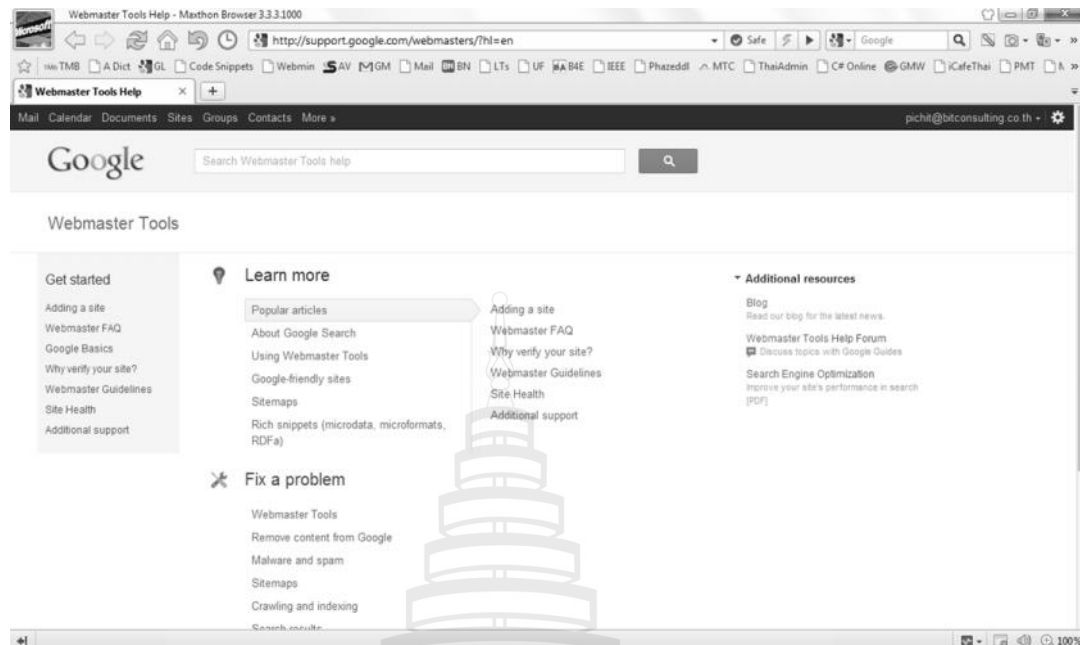


Figure 3.2 A Detail for Webmaster for Google SEO

3.1.1.2 Web Structure Designs

Normally website can develop from many language (ASP.NET, PHP, JAVA, etc.) which the structure that developer can develop and ignore the format and structure. After spider goes to that website and gets result of keyword for ranking search engine, web site normally was not shown in first page. However, if the developer applies web structure after spider gets the result of keyword, that result will improve ranking in the search engine:

1. HTML title: the most important keyword must be put in the first place of Title because the TITLE of the webpage will be present in the search result page. The title should tell about fabric or keyword referring to website's name or product group.

```

<html>

<head>
<title>ผ้าทอมือ ลายน้ำไหล เมืองน่าน</title>
</head>

<body>
...
</body>

</html>

```

Figure 3.3 Define a Title for HTML Document

1) Add title text (H1): the title text in the HTML language is from H1 to H6 increasing to the top level of search engine.

```

<html>
<body>

<h3>ลักษณะผ้าทอมือ ผ้าลายน้ำไหล เมืองน่าน</h3>

...

</body>
</html>

```

Figure 3.4 Define a H1 to H6 for HTML Document

2) Description of product: there are interesting 100-150 words about details of product put to the title section, and another section will have details of the product for the information.

3.1.1.3 E-Commerce Web Development

This research implements e-commerce web site from “nopCommerce” which is a fully customizable shopping cart. It is stable and highly usable. “nopCommerce” is an open source e-commerce solution that is based on ASP.NET 4.0 and MS SQL 2005 (or higher) backend database. Our easy-to-use shopping cart solution is uniquely suited for merchants that have outgrown existing systems, and may be hosted with your current web hosting or our hosting partners. It has everything you need to get started in selling physical and digital goods over the internet.

This website implements part of the show content and detail of product by using function to separate keyword from the detail data and other TAG of HTML code.

3.1.1.4 Domain Registration and Publication

After testing that website from the local computer, researcher will register domain and web hosting to publish that website in the Internet. For this website, researcher registers domain name (<http://www.nanfabric.com>) and add domain to the Google which does not know the website. So, it is needed to own a site, register domain name, and verify the website before showing the user certain information about it or enable the user to use the tools. Verification does not affect PageRank or your site's performance in Google's search results. Steps to do are as follow:

1. Ensure that you have added your site to your Google Webmaster Tools account.
2. On the Webmaster Tools Home page, click Verify this site next to the site you want.
3. In the Verification method drop-down list, select Meta tag (if it is not already selected).
4. Copy the meta tag that appears on the page.
5. In Google Sites, open the site you want to verify.
6. In the top right corner, click More actions, and then click Manage site.
7. In the left-hand column, under Site settings, click General.
8. In the Google Webmaster Tools verification box, paste the meta tag you copied from Webmaster Tools, and click Save changes.
9. Go back to Webmaster Tools verification page, and click Verify.

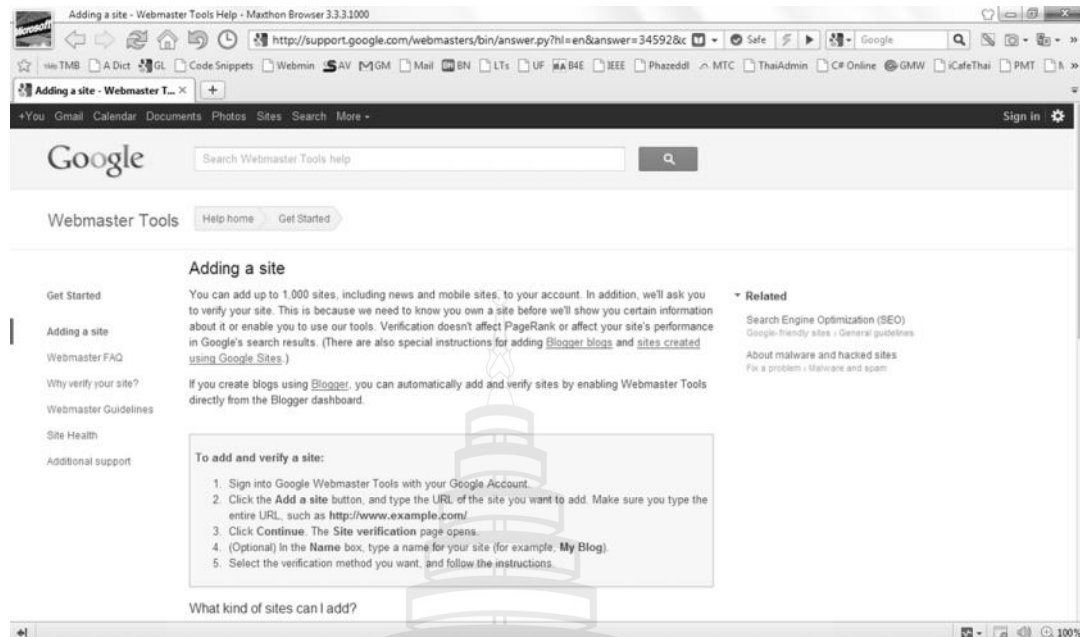


Figure 3.5 A Detail of Adding Website to Google

3.1.1.5 Test Process

If everything completes, the developer should transfer the website to user and admin in order to test that website, check user-friendly, and check bug of website.

3.1.1.6 Evaluation

After adding URL to the Google website, Google spider will spend 2-3 days to explore and learn the keyword of the website and compare ranking of keyword with another website. If the ranking result of the website is not within pages 2, developer should check the function of website and optimize it again until it gets to the satisfying result. This method needs to do about 2-3 times.

3.2 Web Implementation

This section describes details of web implementation and system requirements of a Search Engine Optimization using structure keyword for Thai E-Commerce.

This research uses open source “nopCommerce” to test and implement the web site. The researcher is interested in how to put the catchy keywords to the true location before input the entire product to requested field. All data should be saved to the database after that. If product shows data function, keyword will process data from database and input to the “title” and “meta” which split keyword from description in the database.

Figure 3.1 shows the diagram of SEO design methodology, involving two major procedures. For the first design and development procedure, SEO Behaviors analysis was initially made. The analysis considered the methods that search engines access the web sites and collect phases or keywords. Moreover, the analysis also considered SEO-Friendly Website by studying the appropriate words to be appeared in website as well as the appropriate web structures. Subsequently, the web structure was carefully designed so that the revision of web structure can be achieved easily in the future. Finally, the designed website was further developed, particularly for E-commerce purposes through the use of Microsoft Visual Studio 2010 Professional Edition and Microsoft SQL Server 2008.

For the second test procedure, the web site was initially processed for domain registration and publication. The registered domain name is “www.nanfabric.com”. This web site was then uploaded so that the spider function of search engines can access and the rank can be seen from the search result lists. After uploading for one week, the rank of the registered website was checked from www.google.com. Finally, the evaluation of ranking was made. The website was expected to be appeared in high rank of top-ten. Otherwise, the revisions of keyword optimizations will be repeatedly performed.

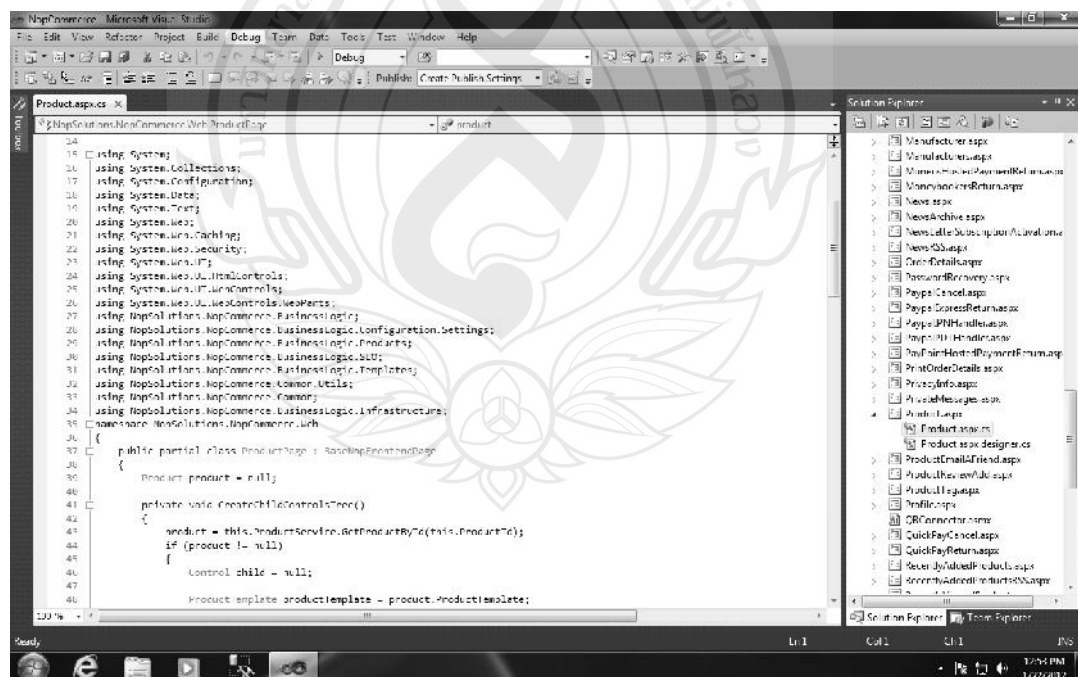


Figure 3.6 A Part of Development Code

```

string[] Awords = Atext.Split(delimiterChars);
int Ax = 0;
foreach (string As in Awords)
{
    if (As != "")
    {
        Ax = Ax + 1;
        if (Ax == 1)
        {
            txtTitle.Text = As.Trim();
        }
        if (Ax == 2)
        {
            txtMeta.Text = As.Trim();
        }
    }
}

```

Figure 3.7 A Function Spit Keyword

3.2.2 System Requirements

This thesis proposes the minimum requirements for both hardware and software as follows:

1. Hardware

1) Processor: Processor type: Pentium III-compatible processor or faster

Processor speed: Minimum: 1.0 GHz

Recommended: 2.0 GHz or faster

2) Ram: Minimum: 512 MB

Recommended: 2.048 GB or more

Maximum: Operating system maximum

Maximum: Operating system maximum.

3) Hard disk: 60 GB.

4) Network: Ethernet 10/100 or 10/100/100.

5) Drive: A CD or DVD drive, as appropriate, required for installation from disc.

6) Display: VGA or higher resolution: at least 1,024x768 pixel resolution.

7) Other Devices: Keyboard and mouse or compatible device.

2. Software

1) Microsoft windows 7 Ultimate (64 bit).

2) Microsoft Visual Studio .Net 2010 Professional Edition Service Pack 1 for developing and implement a web application.

3) Microsoft SQL Server 2008 Developer Edition Service Pack 3 for managing, developing and monitoring the database.

4) Internet Information Service (IIS) 7.0 for the web server.

5) ASP.NET 4.0 (MVC 3.0) for runtime Microsoft .net framework.

6) Microsoft Internet Explorer 9 for test website.



CHAPTER 4

RESULT AND DISCUSSION

This chapter illustrates the details of an experiment and its results. Each step presents the details of the design of creating the system and the outcome.

4.1 Experiment Detail

As mentioned earlier, the ranking evaluations are performed in website “www.google.com”, the most popular search engine, having the largest market share of 65%. The website “www.nanfabric.com” is registered to Google search engine by adding the URL to Google at <http://www.google.com/addurl/?continue=/addurl>. Figure 4.3 and Figure 4.4 shows the search evaluation using two keywords “ผ้าพื้นเมืองน่าน” and “ผ้า่าน”. Note that these Thai keywords, i.e. “ผ้าพื้นเมืองน่าน” and “ผ้า่าน”, mean “Nan Local Fabric” and “Nan Fabric”, respectively.



Figure 4.1 A Main Page of Website

Dashboard Catalog Sales Customers Promotions Content Management Configuration System

Wednesday, December 22, 2010 8:16 AM Home > Configuration > Global Settings

Global Settings Save

General Products Customer profiles SEO/Display Media Live Chat Google AdSense Google Analytics Reward Points

Gift cards Return Requests Security Other

Store name:

Store URL:

Store closed: ☐

Anonymous checkout allowed: ☐

Use one page checkout: ☐

Terms of service: ☐

Figure 4.2 Back End of Website

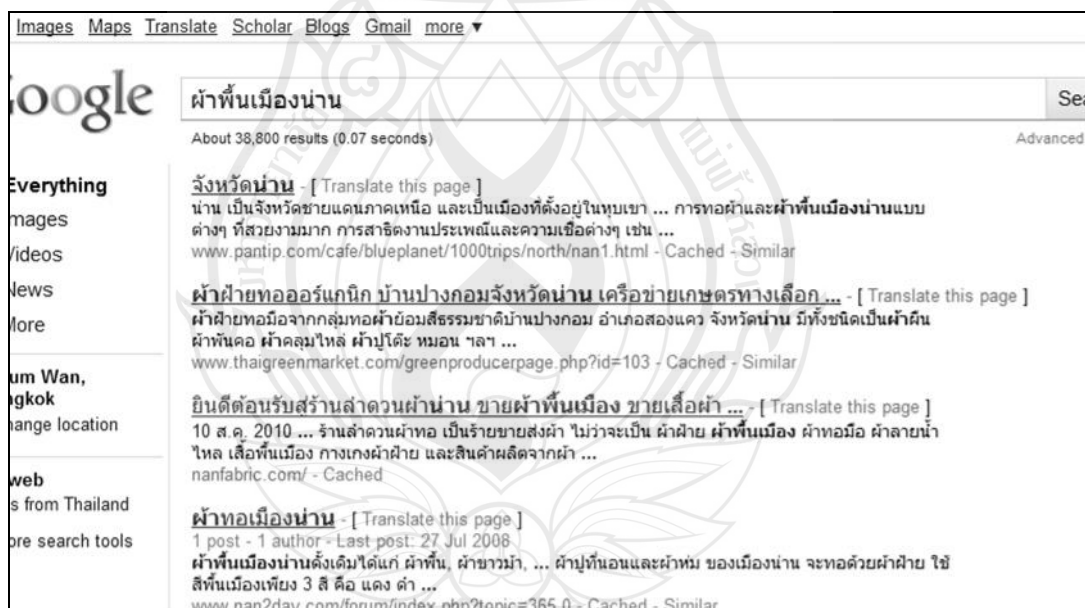
Figure 4.3 The Evaluation Method in Google Search Engine Using Keywords;
“ผ้าพื้นเมืองนาน”.



Figure 4.4 The Evaluation Method in Google Search Engine Using Keywords; “ผ้านาน”.

It is seen in Figure 4.3 and Figure 4.4 that both keywords offer in the website are shown in the third rank, satisfying the expected rank in top-ten level.

4.2 Experimental Results

4.2.1 The result shown in Table 4.1 shows the numbers of visitors in 8 weeks. It reveals that numbers of visitors has been increasing significantly. This increasing rate has shown the effectiveness of SEO system as the website appears in a very top rank, attracting the visitors to click and visit the website.

Table 4.1 Result of Rank from Google Search Engine Fabric Store

Weeks	Ranks	Revisions of web Structure and Keywords
1	83	Revised
2	65	Revised
3	50	Revised
4	20	Revised
5	5	Revised
6	4	Revised
7	3	Satisfied

Table 4.1 (Continues)

Weeks	Ranks	Revisions of web Structure and Keywords
8	3	Satisfied

Table 4.1 shows the ranking in 8 weeks. It can be seen that the number of rank is relatively low within the first four weeks due to inappropriate web structure and keywords. After many revisions in four weeks, the ranking increases to the fifth-rank, and finally to the third-rank, which satisfy the expected rank and corresponding to the number of visits.

Table 4.2 Comparison of Computed Weight With and Without Function Fabric Store

	System With Function	System Without Function
Accuracy	85.00 %	40.00 %

4.2.2 The result shown in Table 4.3 shows the numbers of visitors in 8 weeks. with computer product, the ranking not increase. That result use same SEO strategies

Table 4.3 Result of Rank from Google Search Engine Computer Store

Weeks	Ranks
1	218
2	215
3	192
4	184
5	161
6	165
7	165
8	162

Table 4.3 Shows the ranking in 8 weeks. It can be seen that the number of rank is relatively low.

Table 4.4 Comparison of Computed Weight With and Without Function for Computer store.

	System With Function	System Without Function
Accuracy	40.00 %	30.00 %



CHAPTER 5

CONCLUSION

5.1 Conclusion

Nowadays, the development of SEO in Thailand has generally been achieved commercially through manual customizations in two processes: the website is early developed and subsequently transferred to SEO developing companies for further customizations, which are expensive, time-consuming, and has low level of security. This paper has considered SEO as an Internet marketing strategy and initiated the incorporation of SEO in websites of one process during development and design procedures. This paper has presented the application of SEO system to Thai E-commerce by using structured keywords. The proposed SEO system was designed and integrated into the website during the development and design processes through open source codes. The new website named “www.nanfabric.com” has been developed for research purposes, and investigated for ranking improvement within eight weeks. The results showed that this website has been found in the third rank by Google search engine. This work has offered a potential alternative to low-cost and simple application of SEO in the development and design processes for Thai E-commerce industries.

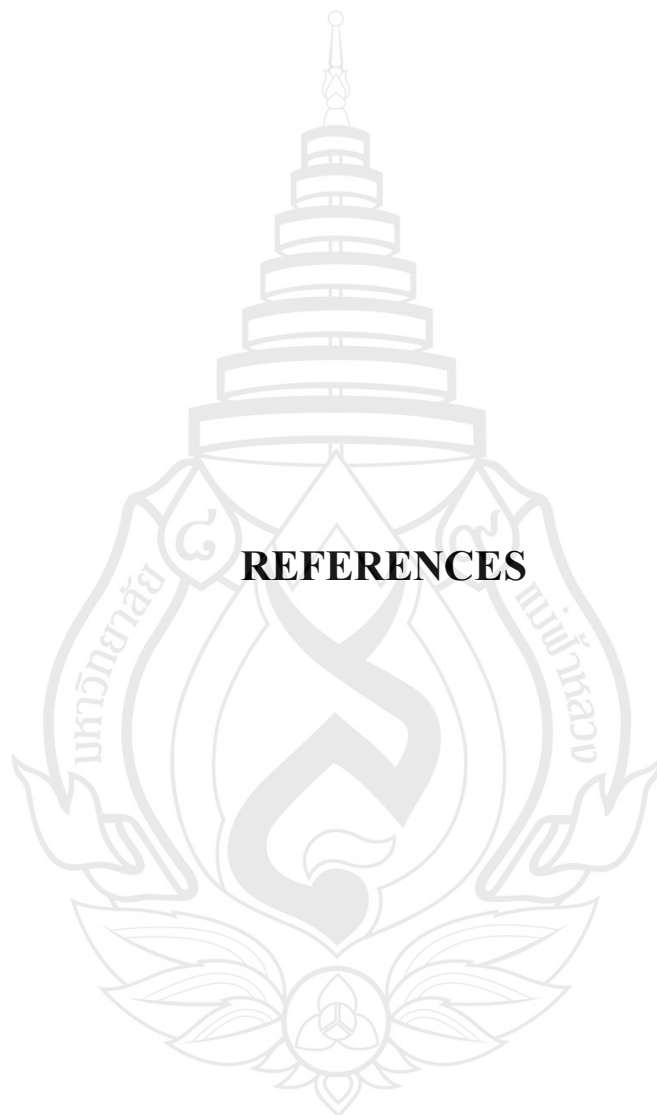
In this research, the structure of the web site was not only designed to comply with Web 2.0 standard, but it was also designed to be compatible with Google Master Tools. These tools are used to configure how the contents and keywords should be embedded into the web site. The better keyword embedding strategy is the easier the web site is founded by the search engine. This will result in high web site ranked by the search engine. For example, the optimal size of image, without reducing the resolution, should be predefined before publishing any images on a web site. The images can be manipulated to the optimal size by using software such as Adobe Photoshop CS, Adobe ImageReady CS, AcdSee, SnagIt Editor, and etc. before being published to the web site. The web site would be more user-friendly and effective if it has an automatic image manipulation feature so that the user does not have to manage the size of image himself. The last important structure of the web site in this research is Meta Information. The Meta Information consists of Meta tag, Meta keyword, and Meta Description. The limited size of Meta Information is extracted from product descriptions by the proposed system. In this research, the size of Meta Information is limited to 700 words in total which comprises of 100 words of Meta Tag, 200 words of Meta Keyword, and 400 words of Meta Description. By doing this, the ranking of the web site will be improved since the search engine can find the important information faster. As a result, the experimental web site was listed in 20-top rank,

normally in 10 top rank. The high ranked web site will get more interest from internet surfers and perhaps affect to the growth of sales of its products.

5.2 Future Work and Suggestion

This research focuses on structure and keyword location in HTML tag and next generation HTML5 system which is needed to change. In the future, a method of ranking the Google search engine might be changed, so developer should change or adjust themselves to match with website using SEO technique and new technology. As a space in Thai language is not similar to English language, the spider or crawler searches keep keyword in the website differently. Thus, developer needs to try many ways and techniques to get a good rank and result on the web site.

Since this research is implemented using open source software, it is better if new development can encourage the developer to create and design database, function, and new SEO feature for Thai only. So, if Google search engine changes rule to get the result of web site, the developer can adapt and apply to new rules quickly and easily. To clarify, Google changes rule if the website in the first page of web site rank with the Google is down; therefore, if the developer can change banner quickly, the result of rank can be improved effectively.



REFERENCES

- Cui, M. & Hu, S. (2011). Search engine optimization research for website promotion. **Information Technology, Computer Engineering and Management Sciences (ICM)**, 1, 100-103.
- Enge, E., Spencer, S., Fishkin, R. & Stricchiola, J. (2009). **The art of SEO: Mastering search engine optimization**. New York: O'Reilly Media.
- Feridun, M. & Tanner, A. (2010). A Search engine for systems management. **Network Operation and Management Symposium (NOMS)**, 1, 697- 710.
- Joshi, A. & Motwani, R. (2007). Keyword generation for search engine advertising. **Web Intelligence and Intelligent Agent Technology**, 6, 490-496.
- Ledford, J. (2007). **SEO: Search engine optimization bible**. Texas : Wiley Publishing.
- Li-Hsing, H. (2010). The application of search engine optimization for internet marketing: An example of the motel websites. **Computer and Automation Engineering (ICCAE)**, 1, 380-383.
- Liu, Y., Wang, Q., Guo L., Yao, Q., Lv, N. & Wang, Q. (2007). The optimization in news search engine using formal concept analysis. **Fuzzy Systems and Knowledge Discovery**, 4, 45-49.
- Su, A., Hu, C., Kuzmanovic, A. & Koh, C. (2010). How to improve your goole ranking: Myths and reality. **Web Intelligence and Intelligent Agent Technology (WI-IAT)**, 1 , 50-57.
- Yunfeng, M. (2010). A study on tactics for corporate website development aiming at search engine optimization. **Education Technology and Computer Science (ETCS)**, 1, 673-675.
- Young, T. & Hsu, J. (2009). Knowledge based search engine: Granular computing on the web. **Web Intelligence and Intelligent Agent Technology**, 1 , 9-18.

Wu, H. (2011). Search engine optimization of e-commerce websites. **Management and Service Science (MASS)**, 1, 1-3.

Wu, S., Chang, H., Hsu, T. & Lin, P. (2007). Approximate keyword search in web search engines. **Digital Information Management**, 1, 404-411.

Zhao, C., Lu, J. & Duan, F. (2009). Application and research of SEO in the development of web 2.0 site. **Knowledge Acquisition and Modeling**, 2, 236-238.





APPENDICES

APPENDIX A

EXAMPLES OF THAI E-COMMERCE WEBSITE

A.1 Main Page



Figure A1 Example of Main Page.

A.2 Product detail



Figure A2 Example of Product Detail.

A.3 Summary of order

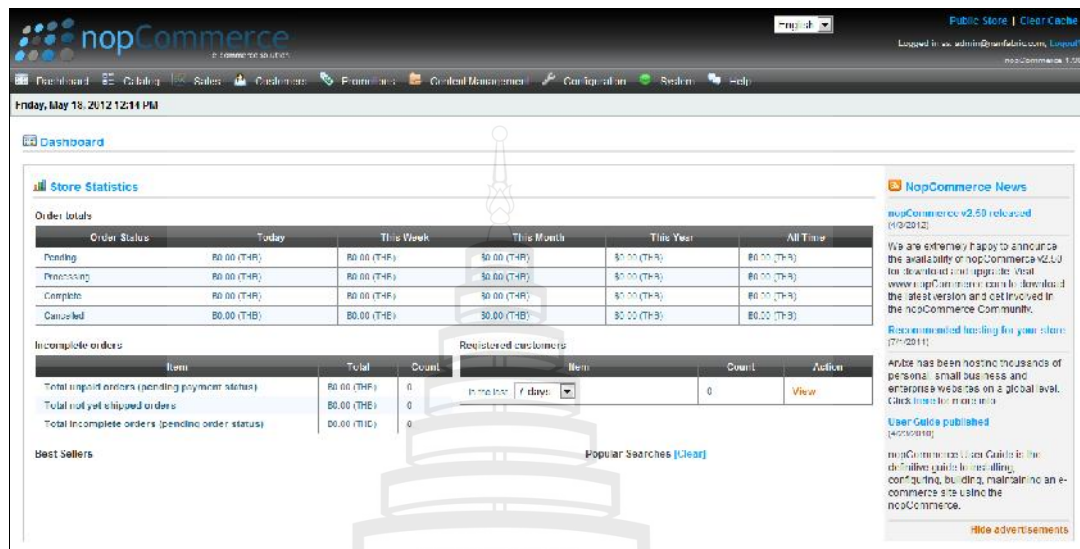
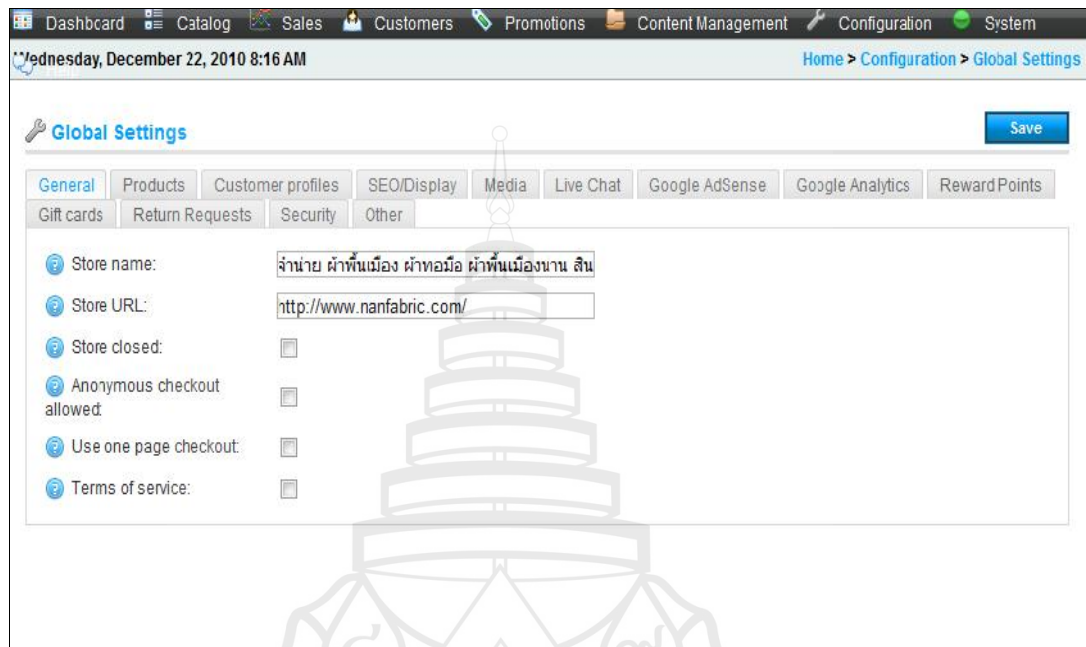


Figure A3 Example of Summary of Order.

A.4 Back End Website



The screenshot displays the Magento 1.9.1.0 Back End Website Configuration interface. The top navigation bar includes links for Dashboard, Catalog, Sales, Customers, Promotions, Content Management, Configuration, and System. The breadcrumb trail indicates the current location: Home > Configuration > Global Settings. The Global Settings section is active, showing a 'Save' button and a list of configuration tabs: General, Products, Customer profiles, SEO/Display, Media, Live Chat, Google AdSense, Google Analytics, Reward Points, Gift cards, Return Requests, Security, and Other. The General tab is selected, displaying the following configuration options:

- Store name: จำหน่าย ผ้าพื้นเมือง ผ้าทอมือ ผ้าพื้นเมืองนาน สีน
- Store URL: <http://www.nanfabric.com/>
- Store closed: ☐
- Anonymous checkout allowed: ☐
- Use one page checkout: ☐
- Terms of service: ☐

Figure A4 Example of Back End Website.

A.5 Product Configuration

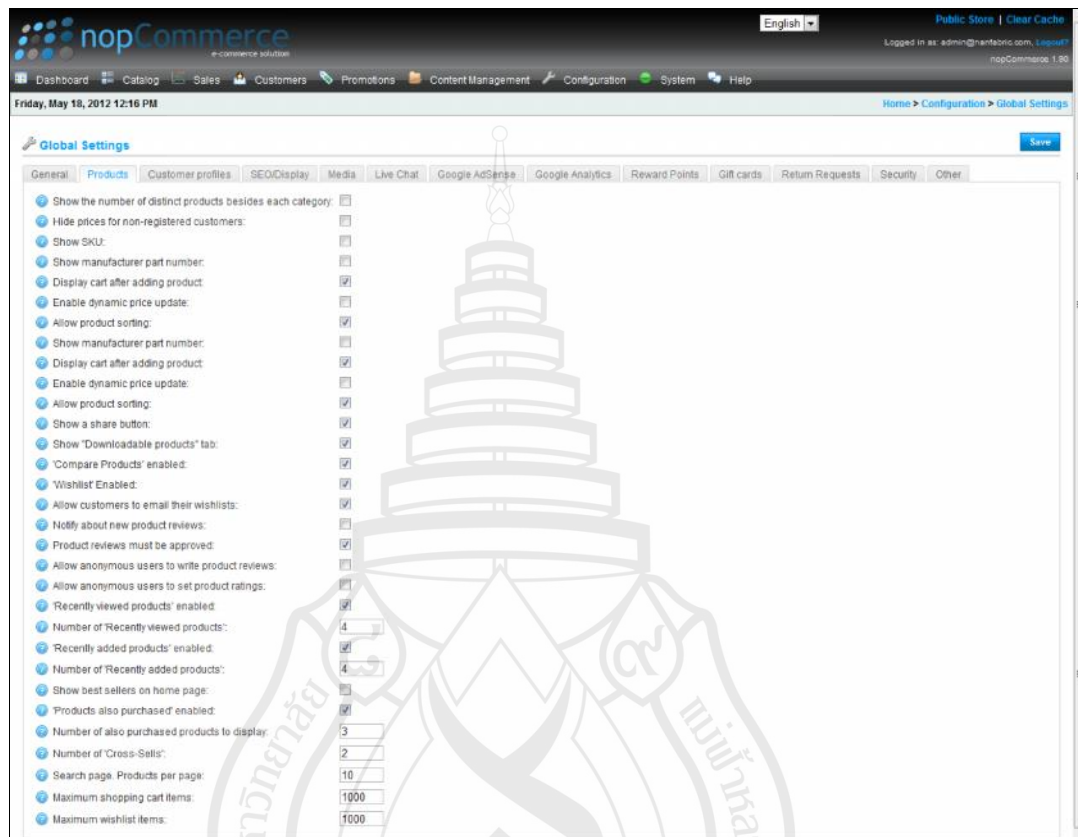
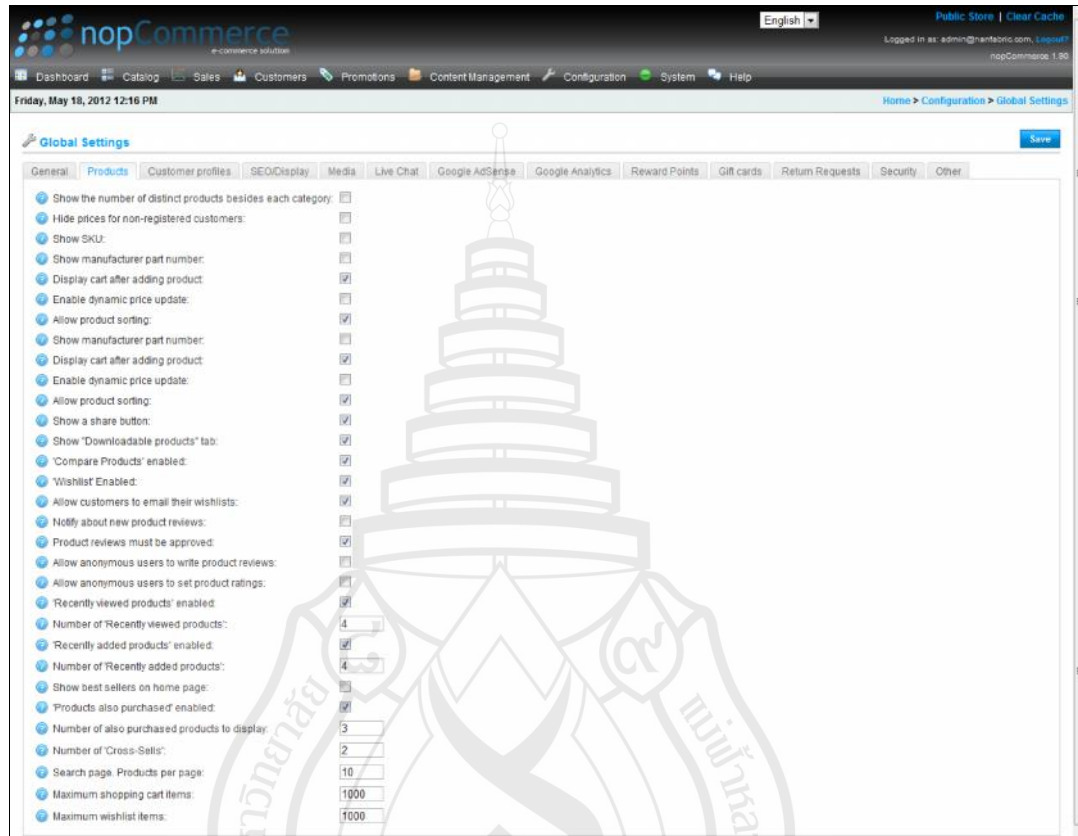


Figure A5 Example of Product Configuration.

A.6 Customer Configuration



Global Settings [Save]

General | **Products** | Customer profiles | SEO/Display | Media | Live Chat | Google AdSense | Google Analytics | Reward Points | Gift cards | Return Requests | Security | Other

- Show the number of distinct products besides each category: ☐
- Hide prices for non-registered customers: ☐
- Show SKU: ☐
- Show manufacturer part number: ☐
- Display cart after adding product: ☒
- Enable dynamic price update: ☐
- Allow product sorting: ☒
- Show manufacturer part number: ☐
- Display cart after adding product: ☒
- Enable dynamic price update: ☐
- Allow product sorting: ☒
- Show a share button: ☒
- Show 'Downloadable products' tab: ☒
- 'Compare Products' enabled: ☒
- Wishlist Enabled: ☒
- Allow customers to email their wishlists: ☒
- Notify about new product reviews: ☐
- Product reviews must be approved: ☒
- Allow anonymous users to write product reviews: ☐
- Allow anonymous users to set product ratings: ☒
- 'Recently viewed products' enabled: ☒
- Number of 'Recently viewed products':
- 'Recently added products' enabled: ☒
- Number of 'Recently added products':
- Show best sellers on home page: ☐
- 'Products also purchased' enabled: ☒
- Number of also purchased products to display:
- Number of 'Cross-Sells':
- Search page. Products per page:
- Maximum shopping cart items:
- Maximum wishlist items:

Figure A6 Example of Customer Configuration.

A.7 Google analytic Configuration

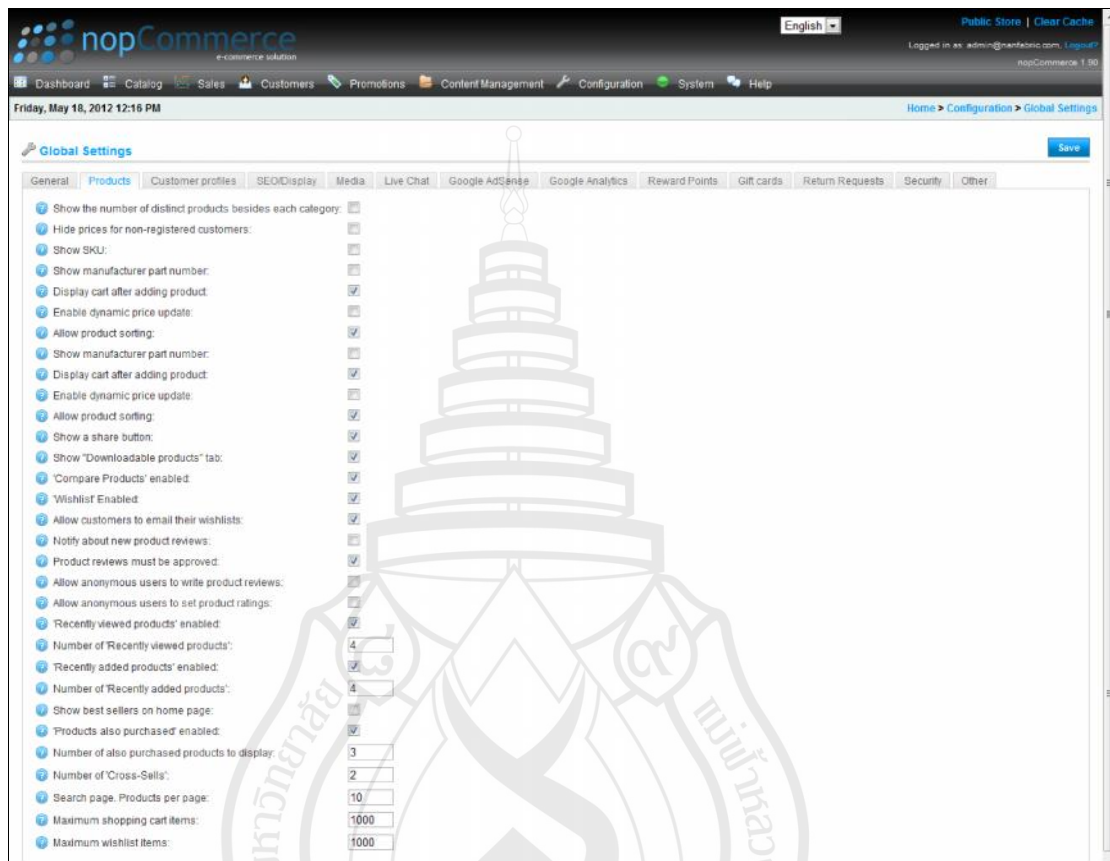


Figure A7 Example of Google Analytic Configuration.

A.8 Security Configuration

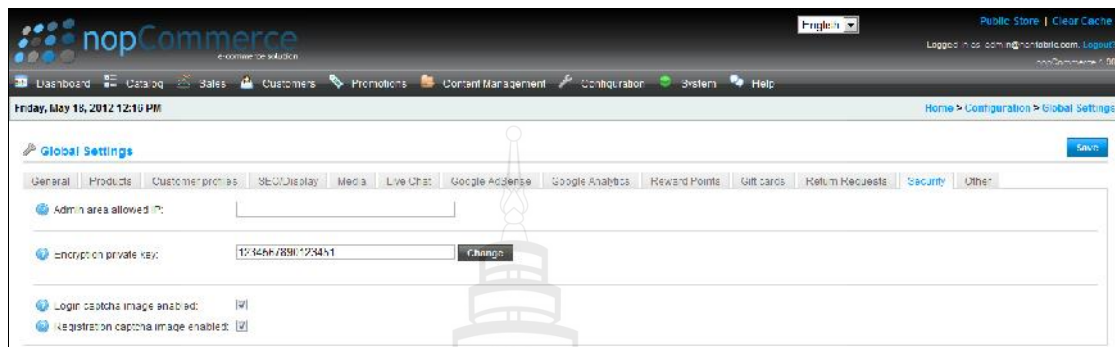


Figure A8 Example of Security Configuration.

A.9 Categories Management

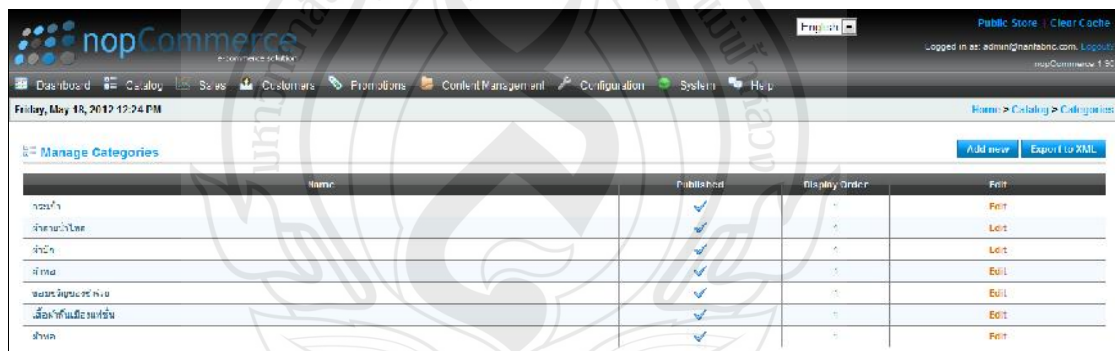
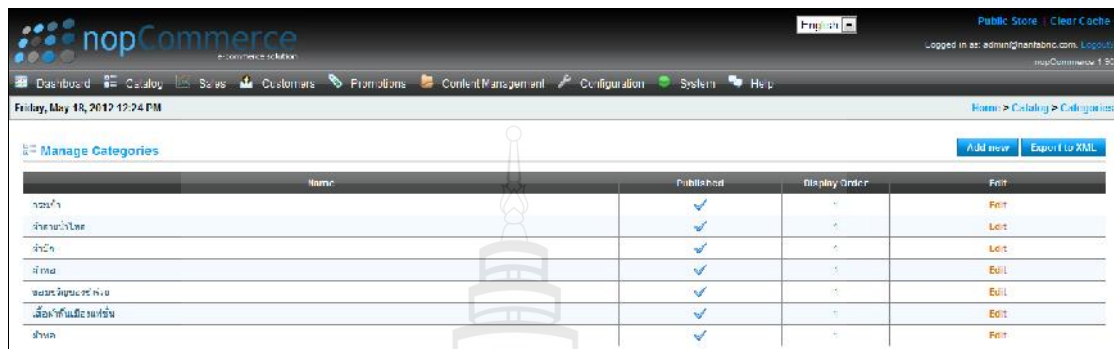


Figure A9 Example of Categories Management.

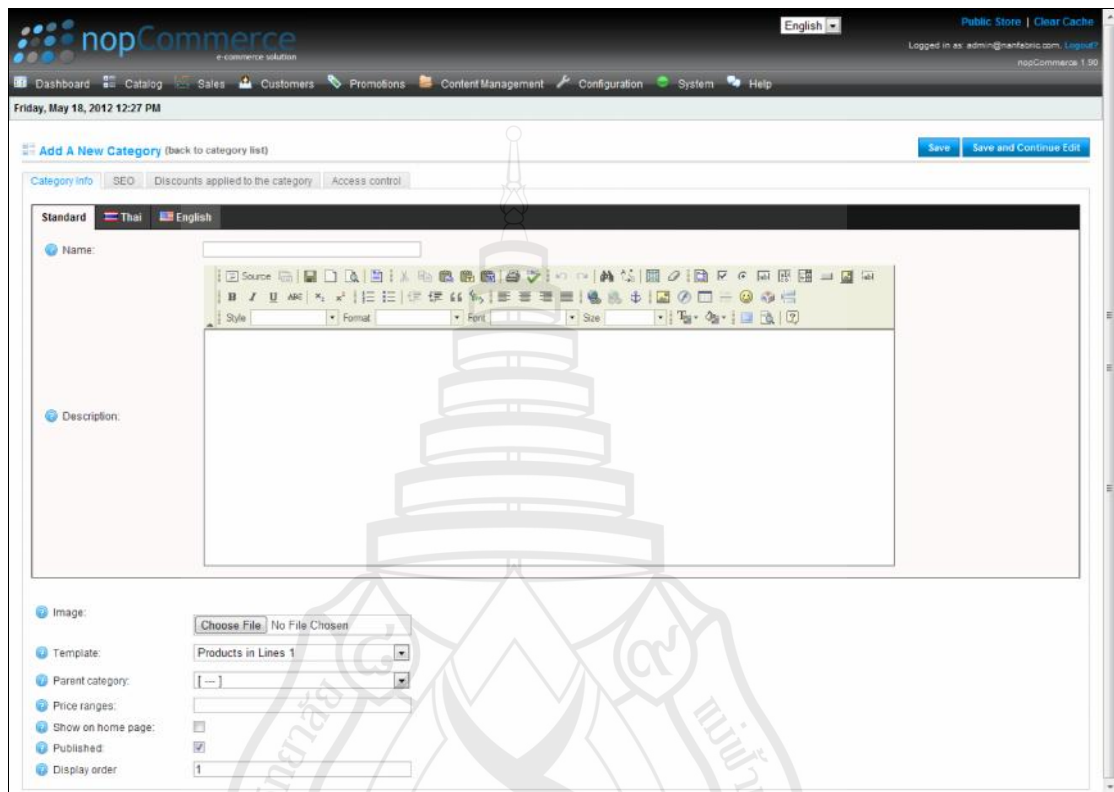
A.10 Categories Management



Name	Published	Display Order	Edit
สินค้า	✓	1	Edit
สินค้าใหม่	✓	2	Edit
สินค้า	✓	3	Edit
สินค้า	✓	4	Edit
สินค้า	✓	5	Edit
สินค้า	✓	6	Edit
สินค้า	✓	7	Edit

Figure A10 Example of Categories Management.

A.11 Add New Categories



The screenshot displays the 'Add A New Category' page in the nopCommerce administration interface. The page is titled 'Add A New Category (back to category list)' and includes a 'Save' button and a 'Save and Continue Edit' button. The form is divided into several sections:

- Category info:** This section contains a 'Name' field with a rich text editor toolbar above it. The toolbar includes options for Source, Bold, Italic, Underline, Text color, Background color, Bulleted list, Numbered list, Indent, Outdent, Link, Unlink, and Image. Below the 'Name' field is a 'Description' field.
- Image:** This section includes a 'Choose File' button and a 'No File Chosen' status.
- Template:** A dropdown menu set to 'Products in Lines 1'.
- Parent category:** A dropdown menu set to '[-]'. Below this is a 'Price ranges' field.
- Show on home page:** A checkbox that is currently unchecked.
- Published:** A checkbox that is currently checked.
- Display order:** A text input field containing the value '1'.

The page also features a navigation bar at the top with links to Dashboard, Catalog, Sales, Customers, Promotions, Content Management, Configuration, System, and Help. The user is logged in as 'admin@nopcommerce.com' and the date is Friday, May 18, 2012 12:27 PM.

Figure A11 Example of Add New Categories.

A.12 Products Management

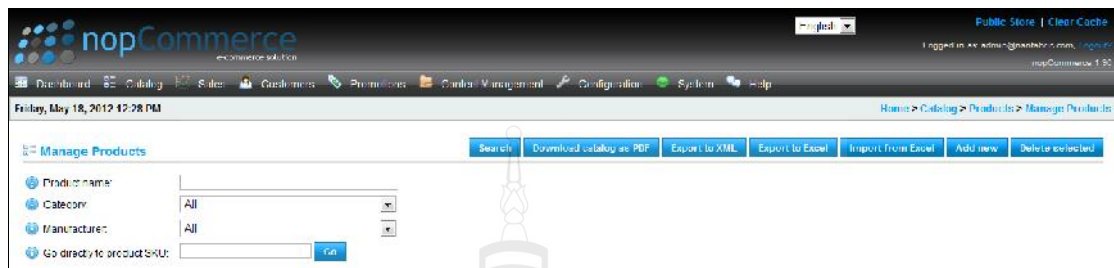


Figure A12 Example of Products Management.

A.13 Add New Products

Product Info

Product name:

Short description:

Full description:

Product Template

Product template:

Show on home page: ☐

Published: ☒

Allow customer reviews: ☒

Allow customer ratings: ☒

Product tags:

Product Details

Product SKU:

Manufacturer part number:

Price: (THB)

Old price: (THB)

Product cost: (THB)

Disable buy button: ☐

Call for price: ☐

Customer enters price: ☐

Available start date:

Available end date:

Shipping

Is Gift Card: ☐

Downloadable product: ☐

Recurring product: ☐

Shipping enabled: ☒

Free shipping: ☐

Additional shipping charge: (THB)

Weight: (lbs)

Length: (inches)

Width: (inches)

Height: (inches)

Stock

Tax exempt: ☐

Tax category:

Manage Stock: ☒

Stock quantity:

Display stock availability: ☐

Minimum stock quantity:

Low stock activity:

Notify admin for quantity below:

Backorders:

Minimum cart quantity:

Maximum cart quantity:

Warehouse:

Figure A13 Example of Add New Product.

A.14 Poll Management



Figure A14 Example of Poll Management.

A.15 Add a New Poll

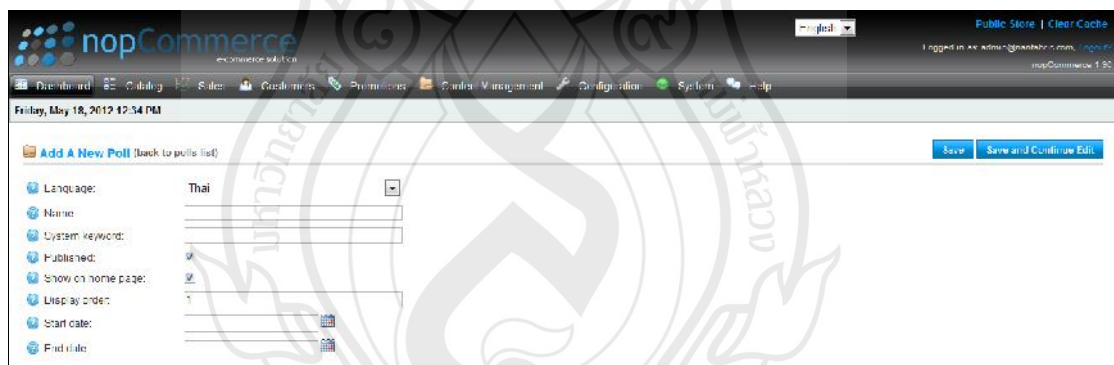
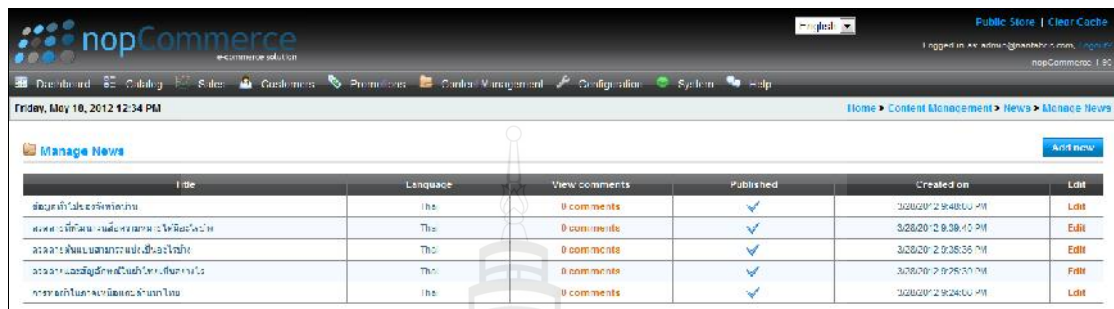


Figure A15 Example of Add a New Poll.

A.16 News Management

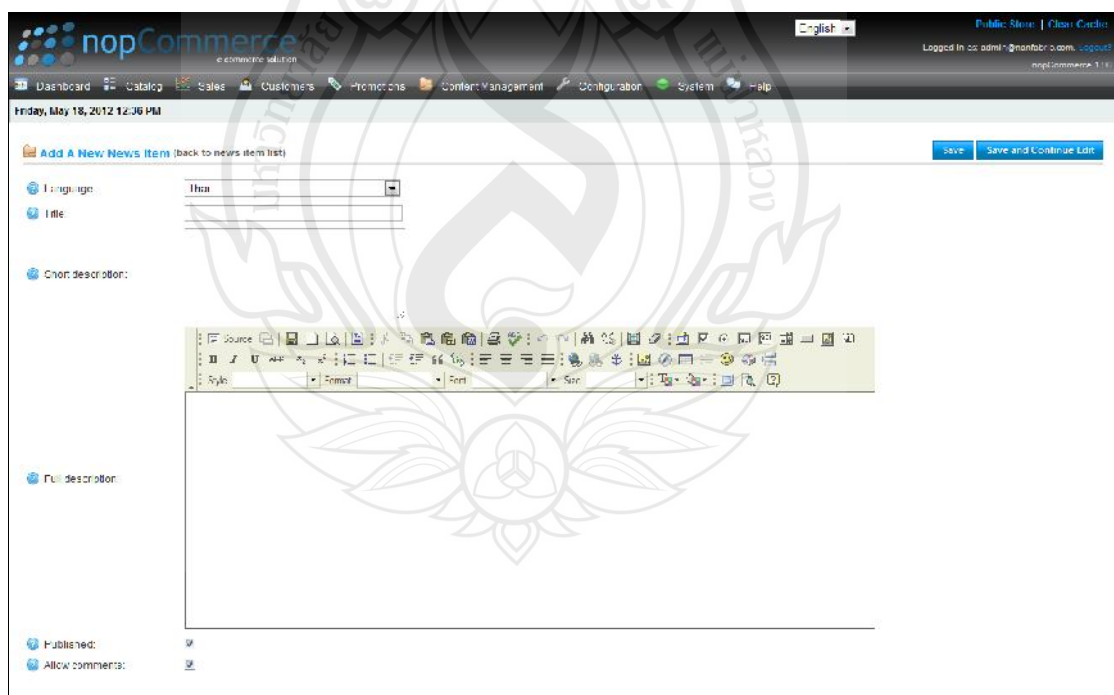


The screenshot shows the 'Manage News' page in the nopCommerce admin interface. It features a table with columns for Title, Language, View comments, Published, Created on, and List. There are four news items listed, all in Thai language, with 0 comments each. The 'Published' column shows checkmarks, and the 'List' column has 'Edit' and 'Delete' links for each item.

Title	Language	View comments	Published	Created on	List
สํานักงานส่งเสริมการค้า	Thai	0 comments	✓	3/26/2012 9:40:00 AM	Edit
สํานักงานส่งเสริมการค้า	Thai	0 comments	✓	3/26/2012 9:38:40 PM	Edit
สํานักงานส่งเสริมการค้า	Thai	0 comments	✓	3/26/2012 9:36:35 PM	Edit
สํานักงานส่งเสริมการค้า	Thai	0 comments	✓	3/26/2012 9:25:31 PM	Edit
สํานักงานส่งเสริมการค้า	Thai	0 comments	✓	3/26/2012 9:24:00 PM	Edit

Figure A16 Example of News Management.

A.17 Add a News



The screenshot shows the 'Add A New News Item' form in the nopCommerce admin interface. The form includes fields for Language (set to Thai), Title, and Short description. Below these is a rich text editor for the Full description. At the bottom, there are checkboxes for 'Published' and 'Allow comments', both of which are checked.

Language: Thai

Title:

Short description:

Full description:

Published: ☒

Allow comments: ☒

Figure A17 Example of Add a News.

A.18 Templates Management



Figure A18 Example of Templates Management.

A.19 Add A New Product Template

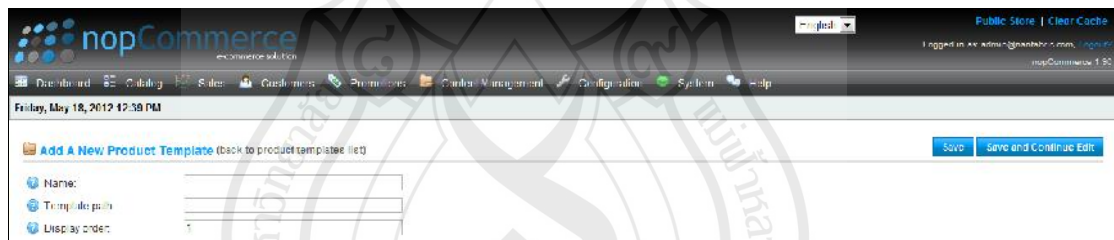


Figure A19 Example of Add a New Product Template.

Click Here to Quit Full Screen

English

Public Store | Close Cache

Dashboard

Catalog

Sales

Customers

Promotions

Content Management

Configuration

System

Help

Logged in as: admin@nontabris.com

Logout?

nocashregister (0)

Fri May 18, 2012 12:41 PM

Home > Content Management > Localization

Localization

Search

Add new

Select language:

Thai

Resource name:

Resource value:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33

Language	Resource name	Resource value	Edit
Thai	Account.AccountActivation	กรุณาส่งอีเมลยืนยัน	Edit
Thai	Account.AccountAlreadyActivated	บัญชีนี้ถูกใช้งานแล้ว กรุณาใช้บัญชีอื่น	Edit
Thai	Account.AccountConfirmHeadlineContent	โปรดตรวจสอบว่าข้อมูลการลงทะเบียนของคุณถูกต้องก่อนกดปุ่มยืนยัน หากไม่แน่ใจ กรุณาติดต่อฝ่ายบริการลูกค้า	Edit
Thai	Account.AddBillingAddress	เพิ่มที่อยู่สำหรับการจัดส่ง	Edit
Thai	Account.AddShippingAddress	เพิ่มที่อยู่สำหรับจัดส่ง	Edit
Thai	Account.AdminApprovalRequired	สถานะของได้อินโฟร์มेशनจำเป็นต้องได้รับการอนุมัติจากผู้ดูแลระบบ	Edit
Thai	Account.Administration	จัดการระบบ	Edit
Thai	Account.Avatar	รูปโปรไฟล์ผู้ใช้	Edit
Thai	Account.UserNameAddressBookNames	รายการชื่อที่ใช้สำหรับบันทึกที่อยู่อีเมล	Edit
Thai	Account.ChangePassword	เปลี่ยนรหัสผ่าน	Edit
Thai	Account.LoginAndPasswordButton	คลิกที่นี่เพื่อล็อกอิน	Edit
Thai	Account.City	เมือง	Edit
Thai	Account.CaptchaRequired	กรุณาระบุคำตอบจากภาพ	Edit
Thai	Account.CompanyDetails	รายละเอียดบริษัท	Edit
Thai	Account.CompanyNameRequired	กรุณาระบุชื่อบริษัทของคุณ	Edit
Thai	Account.CompanyName	ชื่อ บริษัท	Edit
Thai	Account.CustomerPasswordIsRequired	กรุณาระบุรหัสผ่านของลูกค้า	Edit
Thai	Account.Gallery	แกลเลอรี	Edit
Thai	Account.CustomerAddresses	ที่อยู่ลูกค้า	Edit
Thai	Account.ContactInformation	ข้อมูลติดต่อ	Edit

Figure A20 Example of Localization Management.

APPENDIX B

RESULT OF GOOGLE SEARCH ENGINE

B.1 Default page Google

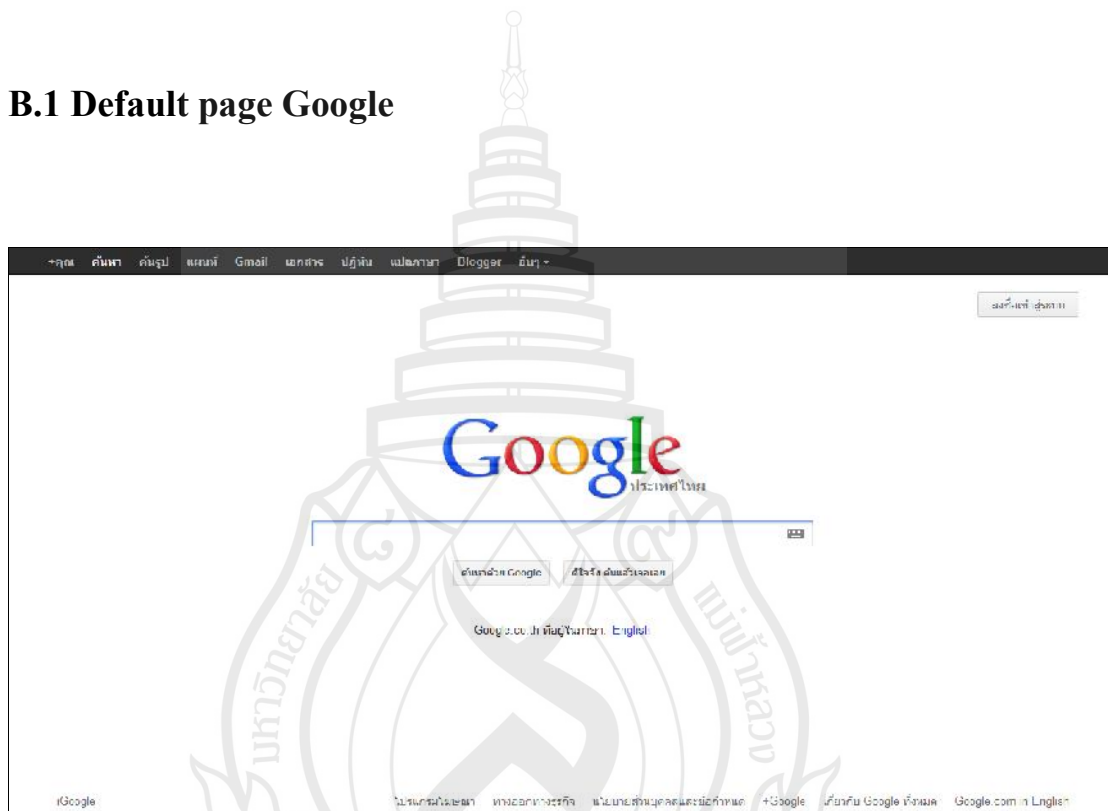


Figure B1 Default Page Google Search Engine.

B.2 Add URL to Google

Google Add your URL to Google

[Home](#)
[About Google](#)
[Advertising Programs](#)
[Business Solutions](#)
[Webmaster Info](#)
[Submit Your Site](#)

Find on this site:

Share your place on the net with us.

We add and update new sites to our index each time we crawl the web, and we invite you to submit your URL here. We do not add all submitted URLs to our index, and we cannot make any predictions or guarantees about when or if they will appear.


Please enter your full URL, including the `http://` prefix. For example: `http://www.google.com/`. You may also add comments or keywords that describe the content of your page. These are used only for our information and do not affect how your page is indexed or used by Google.

Please note: Only the top-level page from a host is necessary; you do not need to submit each individual page. Our crawler, Googlebot, will be able to find the rest. Google updates its index on a regular basis, so updated or outdated link submissions are not necessary. Dead links will fade out of our index on our next crawl when we update our entire index.

URL:

Comments:

Optional: To help us distinguish between sites submitted by individuals and those automatically entered by software robots, please type the squiggly letters shown here into the box below.



Need to remove a site from Google? For more information, [click here](#).

Figure B2 Display Add URL to Google.

B.3 Result of Google search engine

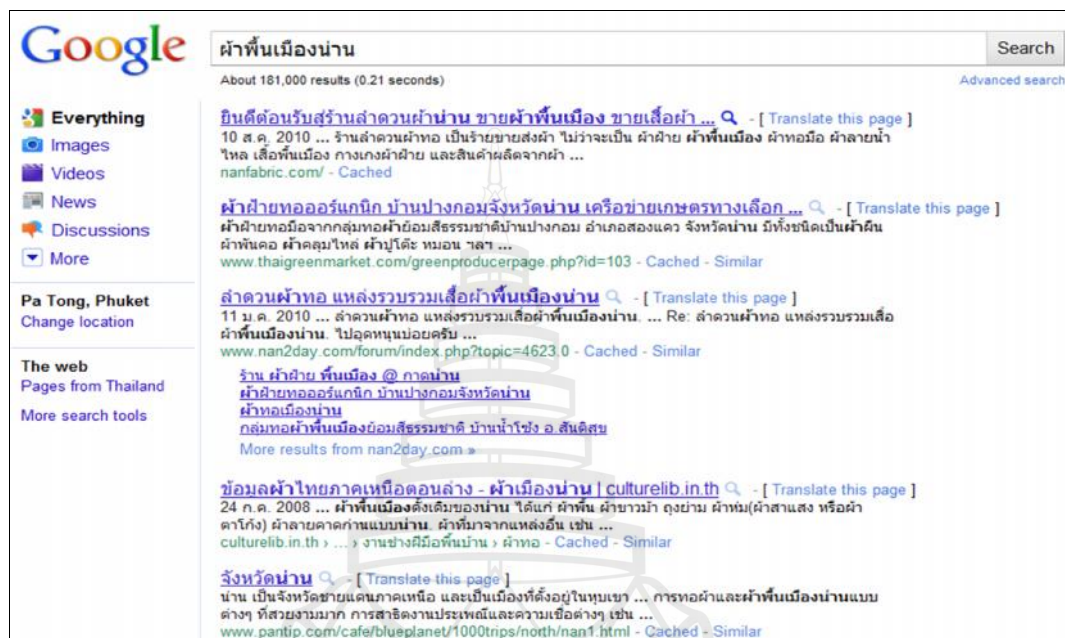


Figure B3 Result of Google Search Engine.

B.4 Main page Google Analytics

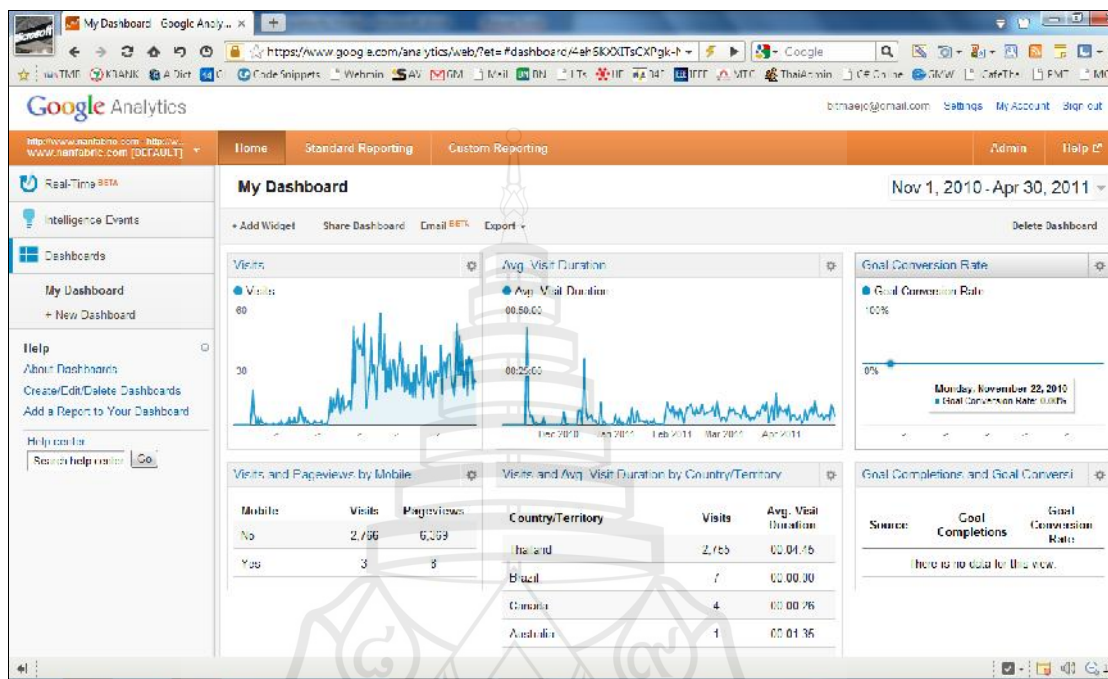


Figure B4 Detail Main Page Google Analytic.

B.5 Result visits website October, 2010.

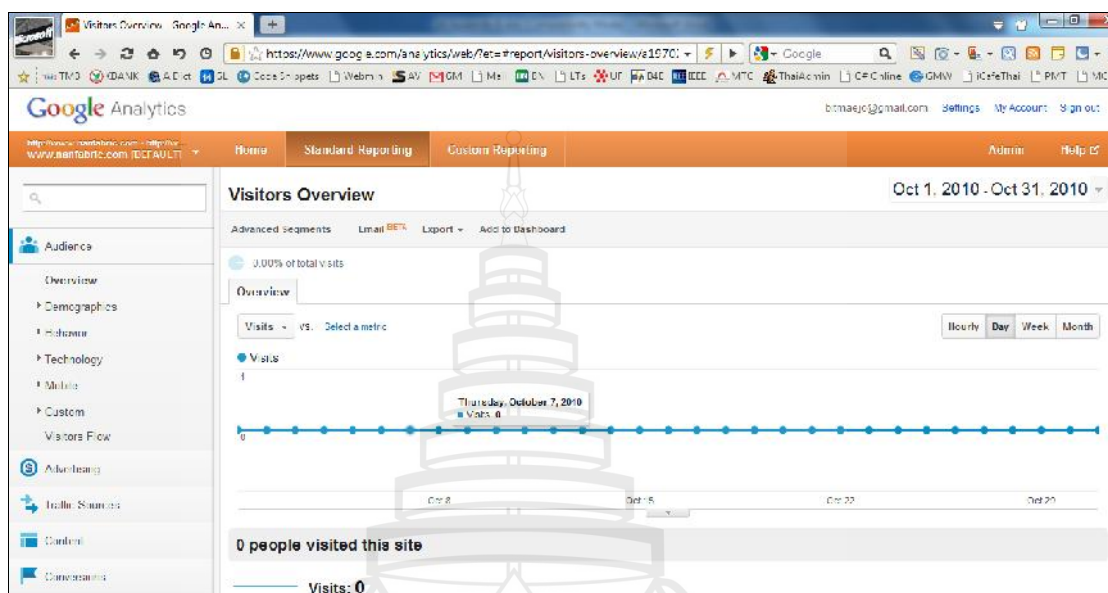


Figure B5 Detail of Visit Website from Google Analytic October, 2010.

B.6 Result visits website November, 2010.

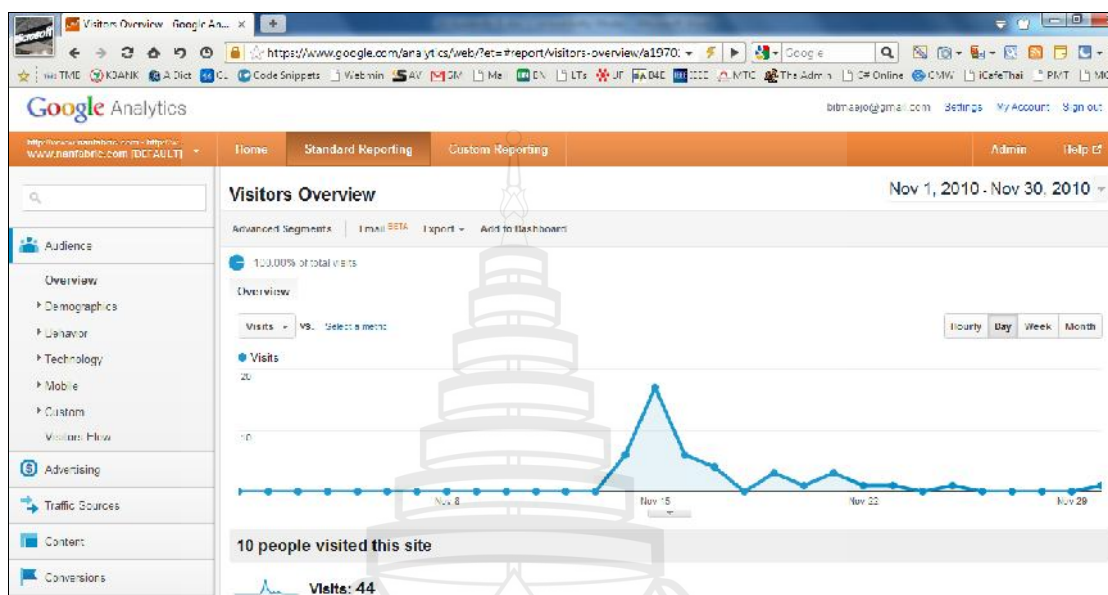


Figure B6 Detail of Visit Website from Google Analytic November, 2010.

B.7 Result visits website December, 2010.

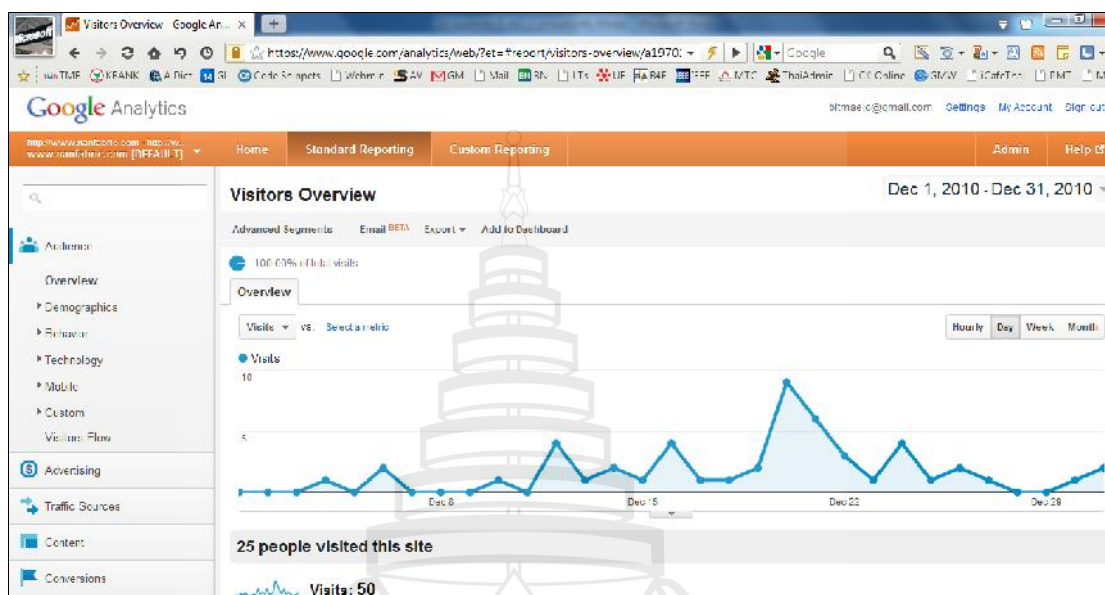


Figure B7 Detail of Visit Website from Google Analytic December, 2010.

B.8 Result visits website January, 2011.

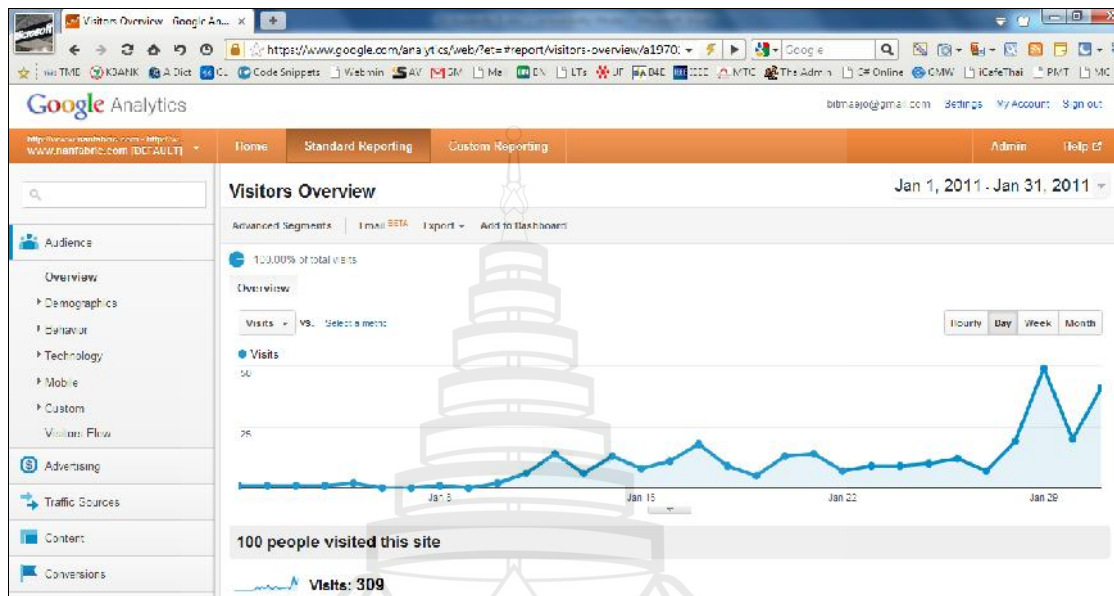


Figure B8 Detail of Visit Website from Google Analytic January, 2011.

B.9 Result visits website February, 2011.

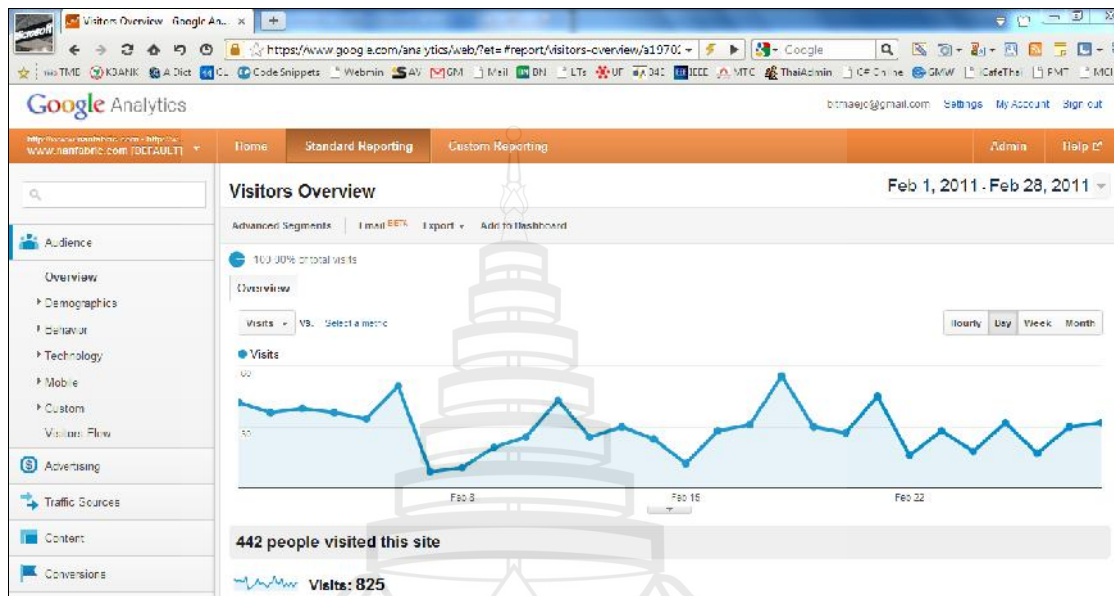


Figure B9 Detail of Visit Website from Google Analytic February, 2011.

B.10 Result visits website March, 2011.

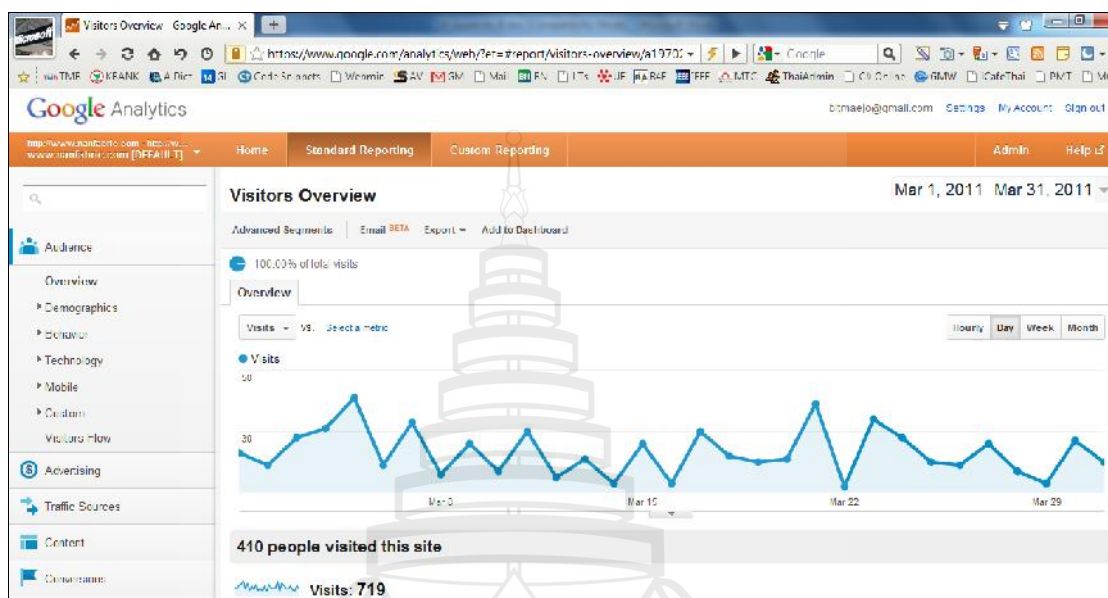


Figure B10 Detail of Visit Website from Google Analytic March, 2011.

B.11 Result visits website April, 2011.

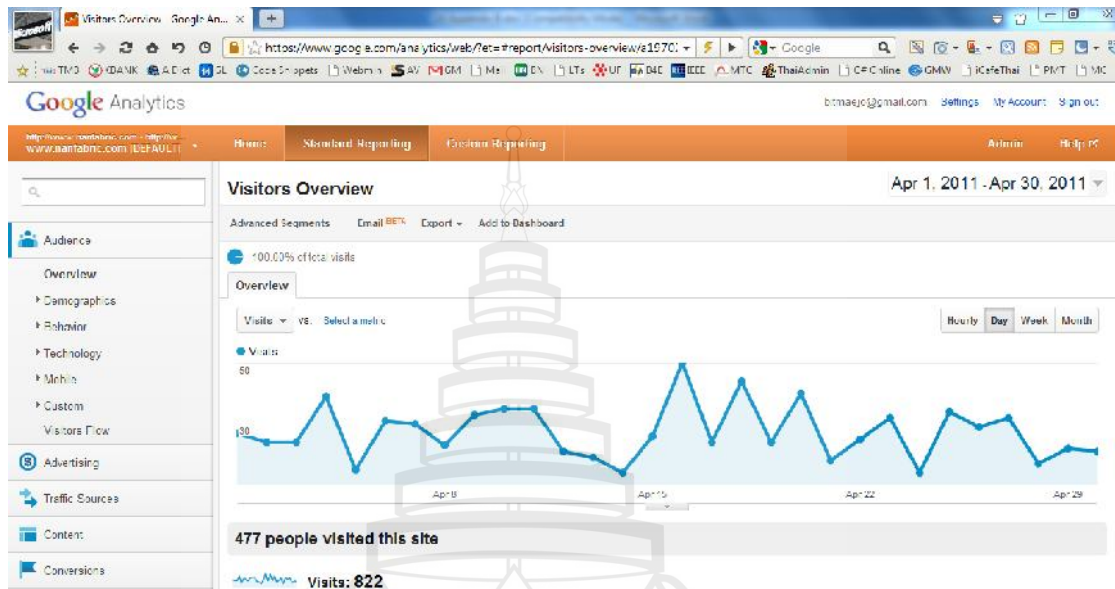


Figure B11 Detail of Visit Website from Google Analytic April, 2011.

APPENDIX C

RESULT SCORES FROM GOOGLE ANALYTICS

Table C1 Result Score from Google Analytic

Month	Unique	Total
October, 2010	0	0
November, 2010	10	44
December, 2010	25	50
January, 2011	100	309
February, 2011	442	825
March, 2011	410	719
April, 2011	477	822

Table C2 Result Ranking from Google Search Engine

Weeks	Ranks	Revisions of web Structure and Keywords
1	83	Revised
2	65	Revised
3	50	Revised
4	20	Revised
5	5	Revised
6	4	Revised
7	3	Satisfied
8	3	Satisfied

Table C3 Result Visitors Overview - November, 2010

Day	Visits
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	6
15	17
16	6
17	4
18	0
19	3
20	1
21	3
22	1
23	0
24	1
25	0
26	0
27	0
28	0
29	0
30	1
Total	44

Table C4 Result Visitors Overview - December, 2010

Day	Visits
1	0
2	0
3	0
4	1
5	0
6	2
7	0
8	0
9	0
10	1
11	0
12	4
13	1
14	2
15	1
16	4
17	1
18	1
19	2
20	9
21	6
22	3
23	1
24	4
25	1
26	2
27	1
28	0
29	0
30	1
31	2
Total	50

Table C5 Result Visitors Overview - January, 2011

Day	Visits
1	1
2	1
3	1
4	1
5	2
6	0
7	0
8	1
9	0
10	2
11	6
12	14
13	6
14	13
15	8
16	11
17	18
18	9
19	5
20	13
21	14
22	7
23	9
24	9
25	10
26	12
27	7
28	19
29	49
30	20
31	41
Total	309

Table C6 Result Visitors Overview - February, 2011

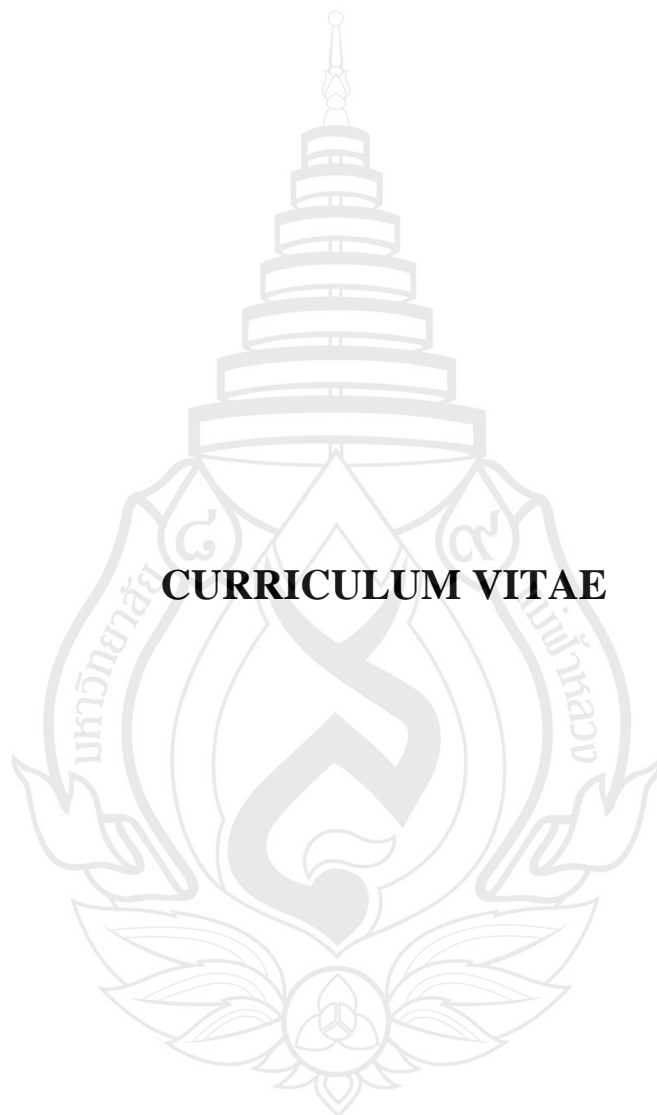
Day	Visits
1	42
2	37
3	39
4	37
5	34
6	50
7	8
8	10
9	20
10	25
11	43
12	25
13	30
14	24
15	12
16	28
17	31
18	55
19	30
20	27
21	45
22	16
23	28
24	18
25	32
26	17
27	30
28	32
Total	825

Table C7 Result Visitors Overview - March, 2011

Day	Visits
1	23
2	19
3	28
4	31
5	41
6	19
7	33
8	16
9	26
10	17
11	30
12	15
13	21
14	13
15	26
16	13
17	30
18	22
19	20
20	21
21	39
22	12
23	34
24	28
25	20
26	19
27	26
28	17
29	13
30	27
31	20
Total	719

Table C8 Result Visitors Overview - April, 2011

Day	Visits
1	27
2	24
3	24
4	39
5	15
6	31
7	30
8	23
9	33
10	35
11	35
12	21
13	19
14	14
15	26
16	50
17	24
18	44
19	24
20	40
21	18
22	25
23	32
24	14
25	34
26	29
27	32
28	17
29	22
30	21
Total	822



CURRICULUM VITAE

CURRICULUM VITAE

NAME	Mr. Pichit Sitthikun
DATE OF BIRTH	09 March 1978
ADDRESS	20 Moo 1 Tambol Rim Amphor Thawangpha Nan, Thailand 55140
EDUCATIONAL BACKGROUND	
2002	Bachelor of Business Administrator Major in Business Information Technology Maejo University
WORK EXPERIENCE	
2011-Present	Managing Director BiT Consulting Co.,Ltd. Bangkok Business Consultant Learning Complex Co.,Ltd. Bangkok
2010-2011	Business Analysis Shernox Consulting Co.,Ltd. Bangkok
2008-2010	System Analysis Son Information Co.,Ltd. Bangkok
2007-2008	Business Consultant Maximal Group Co.,Ltd. Bangkok Guest Lecturer Maejo University, Chiang Mai
2006-2007	Instructor (Computer Department) Srithana Commercial, Chiang Mai Technological College Guest Lecturer Maejo University, Chiang Mai
2004-2006	System Analysis Mosys Solution Co.,Ltd. Chiang Mai
2002-2004	Programmer Mcc Multitech Co.,Ltd. Chiang Mai