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An Empirical Analysis on the Marketing Performance of Korean Exporting Companies by Major Industrial Classification using Search Engine Optimization^a

Sang-Jin Lee^b, Hyo-won Kang^c, Jason Chung^d

Abstract

In the 21st century's information-oriented era where extreme competition is the standard, small and medium exporting companies are gradually decreasing their dependence on the traditional old media and are expanding their dependence on new media that claims to stand for the value of participation and sharing, such as search engines (Google, Yahoo, Bing), SNS (Social Networking Sites), blogs, etc. From among these, export marketing through search engine optimization is the representative marketing tool of the new media marketing channel that takes immediate effect by utilizing the limited marketing resources of small and medium exporting companies and brings flexible realization and successful results.

With this background, this research performed quantitative analysis after collecting and utilizing log data of 346 companies and classifying the firms into 6 representative sectors. It will be used for data mining analysis based on Google Analytics in order to measure the performance of the search engine marketing of small and medium exporting companies. For a more reliable qualitative analysis, the research also implemented verification by business sector through a survey about the performance of search engine marketing for 98 companies. The result of the analysis on overseas marketing performance using search engine optimization by 6 representative business sectors has empirically proved that optimizing the company's homepage appropriately on search engines brought an increase

^a This work was supported by Konkuk University in 2011.

^b Main Author, Professor, Department of International Trade, Konkuk University, e-mail: castle@kku.ac.kr

^c Corresponding Author, PhD Candidate, Department of International Trade, Chung-Ang University, e-mail: hwkang@wm.cau.ac.kr

^d Co-Author, Research Professor, International Trade Division, Dan-Kook University, e-mail: jasonch@dankook.ac.kr

of visitors and page views. Consequently, there was an increase in inquiries, which is the actual expression of purchase intent, and this was a great help to the export marketing of SMCs.

JEL Classification: M31, F10

Keywords: e-Trade, Search Engine Optimization, SEM, SEO, Internet Marketing, Marketing Performance

I . Introduction

According to the World Trade Organization (WTO), Korea proudly raised itself to the world's No. 9 exporting country in 2009. The reason that Korea has been performing relatively well in exports, despite the global financial crisis, was attributed to the multiple synergy of successful improvement in their export market structure that was concentrated on advanced countries, as well as external factors such as a weak currency (KRW), international oil price stabilization, and internal factors such as item diversification and the technical competitiveness of domestic industries.

This performance in exports can be appraised satisfactory compared to competing countries, but the weight of small and medium exporting companies among total exports remains only in the 30% range. The biggest problem is that most of the fruits of export performance are reaped by the large companies. They pursue a vertical efficiency business model, which means the distribution system where the best quality products and components are supplied at the cheapest prices by small and medium companies (SMCs hereafter). Of course, the leap of some large companies up to successful global companies can be appraised as being a great help to the improvement of the nation's competitiveness. However, the central government recently implemented various policies for the mutual growth of large companies and SMCs, which means that the government recognizes the problem of SMCs being deprived of the growth opportunities that exist behind the rapid growth of large companies. We can get a sense of the government's view that the policies to foster and support small and medium exporting companies must be fundamentally changed for the development of the national economy. SMCs have difficulties in discovering new customers and developing overseas markets due to insufficient personnel and money through off-line channels compared with large companies, but it is necessary to review the value of on-line channels in developing overseas markets as buyers all over the world are utilizing new media, including search engines, SNS (Social Networking Sites), and B2B (business-to-business) e-marketplaces, in order to discover new suppliers and to develop new products.

According to an export industry survey by Statistics Korea, 79.4% of all Korean enterprises still use off-line overseas marketing channels such as participating in exhibitions and trade missions. Therefore, there is an urgent need to change the export supporting policies and directions for Korean small and medium exporting companies based on new media utilizing global search engines to cope with the 21st century information age. Especially, in setting up the horizontal network model between large and SMCs that the government recently emphasized, we have to notice that global search engines, while recognizing SMCs and large companies as the same service providers, provide fair opportunities to the SMCs in implementing overseas marketing.

Considering these circumstances, this study argues for change in the export supporting policy for SMCs utilizing new means of search engine marketing in order to implement the policy that can realize external trade environment change and internal mutual growth of large and SMCs. With this in mind, this study aims to draw detailed implementation plans of the supporting policies for the overseas marketing of SMCs through the empirical analysis of overseas marketing performance utilizing search engines that can expand the overseas sales of SMCs in the knowledge information and global era.

This study first raised the necessity for the empirical analysis of the performance measurement of search engine marketing based on the preceding studies on the performance measurement of search engine advertising and internet marketing. In order to generate more scientific and realistic results, we implemented both quantitative data mining analysis and qualitative survey analysis at the same time. We have performed the empirical analysis for just 6 industries, which comprise 91.8% of total exports.

II. Theoretical Considerations of Internet and Search Engine Marketing

1. Definition of internet marketing

Many scholars have provided different definitions of internet marketing. Rafi et al. (2001) stated that internet marketing is the process of establishing and maintaining customer relationships by performing on-line activities for the exchange of ideas, products, and services to satisfy the objectives of companies and customers. In addition, internet marketing or internet-based marketing is defined as the use of the internet and related digital technology to support the modern marketing concept. Researchers insist that the traditional overseas marketing method is fundamentally changing due to the internet, and a new marketing paradigm should be researched and developed in order to enter into the overseas markets in the newly emerging electronic trade era (Chaffey, Mayer, Johnstone and Ellis-Chadwick 2000; Hoffman and Novak 2000).

2. Development process of internet marketing

In traditional marketing, producers or suppliers have initiatives, and they decide the contents of the marketing and selection of the media. Eventually, the quantity and contents of the information are determined by the company regardless of the customer's intent. But modern marketing is based on interactive communications in which companies provide the necessary information for the various media, including the internet, and consumers select the media and search for the information. Under the e-business environment, product information is not just transferred from companies to consumers, but companies, consumers, and customers are all playing main roles in marketing. Daniel and Klimis (1999) proposed the development stage model of electronic market hypothesis (EMH) and insisted that the electronic market would develop into individualized markets worldwide and consumer-oriented markets would be formed.

Since the late 1990s, the Korean government has started to reduce its dependence on traditional overseas marketing methods and to design an internet-based new overseas marketing supporting plan for SMCs, and implemented a foreign language homepage production support project for the export support of SMCs. Recently, with the expansion of e-business, internet-based overseas marketing has become an important marketing channel to develop new overseas markets for SMCs with scarce overseas networks. Therefore, Korea is strategically implementing government-led overseas marketing projects for small and medium exporting companies through the departments of the government and related institutions, which include homepage and catalogue production support, search portal utilization, and cyber exhibitions and consultations.

3. The concept and characteristics of search engine marketing

Search engine marketing is a marketing technique that induces the visit of overseas buyers to the homepages of small and medium exporting companies by exposing the homepages of exporting companies at the top of the keyword search results of international search engines such as Google, Yahoo, and Bing. Search engine marketing has the following major characteristics. First, it can reach numerous potential customers because 90% of all internet users utilize search engines to find information. Second, it is favorable to discover new buyers. If a company's homepage is exposed on the first search page, the number of visitors may increase rapidly for the homepage, and SMCs with little brand power and PR capabilities can possibly promote their products and services worldwide. Third, it can have a high economic effect as compared to other expenditures. Compared to existing traditional marketing

methods such as TV, newspaper, and radio, search engine marketing can continue for a longer period at a far cheaper cost. It is very effective, especially for search ads, because it accurately directs the buyers who search for keywords associated with the products and services of the company. Finally, it is a marketing technique through which internet marketing performance is guaranteed. The marketing effect of this method as compared to its input cost is measured effectively because the number of visitors, the course of the inflow, access country, and interested products are accurately traced through visitor log analytics.

4. Search Engine Optimization

1) Meaning of SEO

SEO is an on-line marketing technique that enables a homepage that is related to the core keywords to be ranked at the top of the search result of a search engine, and is a method that effectively uses the search engine to induce a visit to a homepage. This is a sophisticated process that needs consistent improvement to get a better rank on a search result, and is one of the most effective ways to promote the homepage of SMCs, especially in terms of cost and level of difficulty. In general, companies desperately want to get a higher rank on a search result, so SEO is essential for this. Registration on a search engine does not guarantee visitors. Because simple registration only appears on a directory search, optimization of individual pages that are favorable for the search engine should be applied so that the pages can appear on the web document search in order to make individual pages appear on the search engine.

2) Registering at the top of the search engine

Internet users utilize search engines as the most popular way to obtain the information they want. But the search result for a search word may comprise of hundreds to thousands of items. From the viewpoint of internet users, the items on the search result contain information that is irrelevant to their concern. To be registered at the top of the search engine means to be given priority in searches. To be searched by priority means to be shown on the first page or within the top three pages. When the internet users search for information on the internet, they tend to search from the first to the third search result pages. Therefore, it is very important to be shown on the first page and should be involved in the search result at least by the third page.

Being registered at the top of the search engine, the target is shown first in the result. Even with so many results, the target homepage is shown first. To be searched by priority is an important issue directly related to the number of visits to the homepage because homepages that are not registered at

the top may have fewer visitors and experience a vicious cycle repeated with standings pushed back, even though they are registered on the search engine. Search by priority is made possible through various techniques after analyzing the site, and it maintains the existing rank standing through maintenance. Search engines list the search result in the order of a higher accuracy rate by different algorithms. Therefore, even though the site has the same contents, the accuracy rate differs according to various factors such as the order, repetition, and location of keywords, and the site shown as a result of the search also differs.

The strategy to be registered at the top is, first, to abide by the requirements for registration. To be registered on the search engine, there are many requirements the search engine wants, so the fundamental requirements for registration should be fulfilled. Second, good keywords should be discovered. Search engines operate when users type in the keyword and push the enter button. Therefore, the keyword plays a core intermediary role. A good keyword is the keyword that is easily recalled when the target customers find the information, and the keyword that can be shifted to a purchase by half of the users of the search. In order to select the right keyword, the search word should always be analyzed from the position of the users, and it is important to analyze with what keyword its own homepage is searched. Third, companies should accept the assistance of a competent consulting firm. A competent consulting firm is a firm that best understands search engines. These firms can produce the best results with the combination of the homepage information database and search engine ranking algorithm for registration at the top of the search engine.

3) Analysis of the competitor websites

As most internet users enter a few keywords into the search engine and visit the top 10-30 sites from the result, it is essential to analyze the competitors to be ranked at the top of the search result. Once the competitors' sites are analyzed, it is necessary to register the homepage with contents superior to its competitors by analyzing the registration status of the competitors' homepages to get top search results.

Competitor website analysis is the process of investigating the status of competitor websites registered on the search engine, and it is important in search engine marketing to register the homepage after a detailed analysis of the competitors has been conducted. Search engine marketing can develop more advanced explanations and keywords based on the analysis of registration status and keywords of the competitor as well as the information about the homepage. There is an advantage in understanding the status when registering the homepage as the actual directories of each search engine are dis-

played and the competitors among the sites of the target directory are analyzed. There is no inconvenience to perform individual analysis for various search engines as the competitors for each keyword are displayed by each search engine.

5. The effects of search engine marketing

The effects of search engine marketing are as follows. First, if the site is ranked at the top owing to the increased exposure by introducing the search engine marketing technique, more users possibly click on the link to visit the site. In other words, exposure is maximized. Because all users are potential customers as well as the target customer base who search for the products or services with a specific purpose, providing them with higher exposure opportunities guarantees a higher efficiency marketing result that is different from the marketing technique for unspecified individuals.

Second, there is the effect of corporate image exposure. The search result is not recognized as an advertisement, but recognition is an objective evaluation that is screened by the search engine. Since the company is located higher on the search result, this recognition is reinforced. In addition, as consumers make decisions without any obligations, the information given by the company is delivered without distortion.

Third, the effect continues longer than other marketing techniques. Off-line marketing, such as TV and newspaper ads, and on-line marketing such as banner ads and e-mail public relations (PR) have a time limit. Moreover, expenses are to be paid by the number of exposures for TV and newspaper, by month for banner ads, and by number of e-mails for e-mail PR. This cost structure means that the same expense as the initial expense must be paid continuously to get the advertisement effect.

Fourth, excellent marketing results vis-a-vis the cost are expected as compared to other on-line marketing. Marketing through search engines basically enables exposure to internet users all over the world. Since users accessing a site through search engines are the target customers, there is a higher probability of sales. Search engine marketing can expect to provide year-round continuous results with only a one-time initial setting, and the maintenance costs are very reasonable as well (Kwon 2004, Kim 2009, Lee 2009)

III. Literature Review

1. The study on internet search advertising

In an earlier study on internet search advertising, Byun and Byun (2003)

classified internet advertising into 5 types, which are banner, sponsorship, insertion, push, and pop-up, and proposed detailed operational strategies. On the study of effectiveness of internet contextual advertising by Lee et al. (2007), the difference of advertising effectiveness between contextual and non-contextual advertising is affected by the content and product involvement. When small and medium exporting companies register their homepages on the search engines, selecting the contexts and keywords that they think the buyers may search for has a decisive effect in attracting buyers.

On the study of use behavior of internet users, Kim (2004) empirically analyzed that search engine users mostly use the searching method of typing in keywords into the search window, and the click through rate (CTR) is very low when website owners simply register in the directory and place advertisements. On the other hand, Yi, Kim, and Kweon (2007), in their study of the effects that interaction and context have on the internet search advertising effectiveness, analyzed that on the effectiveness of internet search advertising that takes into account the purchase intent of consumers, such as cognition, impression, emotion and attitude, etc., consideration of interaction and context is closely correlated, and non-interaction and non-context advertising has a very low effect on the purchase intent of consumers.

On the study of the effectiveness of internet advertising, cognition effects at the webpage visit stage, which is the stage of attracting the users' interest, are measured by impressions, access effects at the actual click stage by CTR, cost efficiency of the cognition effect by CPI (Cost Per Impressions), and cost efficiency of access effects by CPC (Cost Per Click) (Park and Kim, 1999).

As a result, by empirically showing that advertising effectiveness increases when sophisticated objectives are established rather than simply placing internet ads at a place of a lot of traffic, the study presents the necessity and importance of establishing sophisticated objectives for internet advertising.

2. The study on the performance measurement of internet marketing

Bang and Kim (2003) examined an integrated evaluation model for performance indicators of internet marketing by integrating the change efficiency model that considers the internet marketing efficiency and the financial performance and customer-level effectiveness that the existing marketing literature values. The study developed the multi-dimensional performance evaluation model and proposed the following three reasons that support the necessity of the study. First, the model to analyze the efficiency of website, which is the performance indicator of internet marketing, is the model that emphasizes the characteristics of the internet as a communication tool. This tool should be complemented by the other performance indicators that consider qualitative as-

pects as the quantitative measurement that considers the number of customers who access the website and purchase products has a limit. Second, financial performance indicators that emphasize marketing efficiency tend to value a short-term view, and there is a possibility to sacrifice long-term objectives such as customer-level effectiveness. Third, the multi-dimensional performance indicators that are proposed in the existing marketing literature have practical difficulties for real application due to their implication and complexity.

Pierre et al. (1998) revealed that the impact of internet marketing on corporate performance was measured by indirect indicators such as website efficiency, and the existing marketing performance indicators were used. For example, analyzing the detailed information of the website visitors by measuring web-tracking through log file analysis and evaluating the efficiency of the website would be the typical examples (Utpal and Lopo, 1998). Most companies concentrate the objective of communication strategy on obtaining the site visitors at the beginning of internet marketing. But in order to accomplish the ultimate goal of the internet marketing, a lot of potential site visitors should become real visitors, and the real visitors should be changed into customers. These processes can be evaluated with the concept of the effectiveness of change marketing.

Meanwhile, Kim (2008), on a comparative study of the success factors of internet export marketing of Korean SMCs, proposed an internet export marketing strategy that examined the factors of importance in classifying internet export performance for Korean small and medium exporting companies that implement export marketing, investigated whether there was a difference in utilizing internet export marketing that the companies with different export performance implemented, and determined whether internet export performance could be enhanced at the same time. After we examined the major factors that differentiated the export performance group by level, we found that differentiating the low performance group from middle and high performance groups were the web investment level, marketing capability, CEO's attitude, level of informatization, and experiential learning. Differentiating the middle from the high performance groups were the characteristics of the products, level of consumer orientation and internationalization, web investment level and experiential learning.

Choe, Park and Hyun (2003) confirmed the interrelationship between an internet business company's strategy and internet technology in SMCs and empirically studied how the application of internet technology affected the performance of the internet company. It appeared that establishing a management strategy of the internet business company and applying internet technology directly affects competitiveness. However, the existence of the management strategy affected the interrelationship, convenience, value, etc., and it was re-

vealed that the management strategy was the preceding variable of internet technology.

Lee and Kang (2009), in an empirical study on the internet marketing performance of exporting companies utilizing search engines, implemented empirical analysis annually only with the quantitative data for the number of visitors, traffic, and page view for two years targeting the SMCs that participated in the registration support project on international search engines. As a result, the number of new visitors was very high and recorded 73.9% of the total visitors, and search traffic through search engines significantly increased during the analysis period. On the other hand, the page views by the visitors dropped as the analysis period ended, which presented the objective data to determine the updating cycle of the homepage.

3. The study on search engine optimization

Xing and Lin (2006) gave a definition of search engine visibility. Search engines are the most fundamental and important means to publicize a website. If a company implements free and paid registration and search engine optimization (SEO) processes appropriately, overseas visitors can easily access the website. Search engine visibility is classified into search engine paid search and SEO. Paid search means that on-line text ads related to the target word are shown when the specific keyword is searched. On the other hand, SEO is the process of organically linking the website that technically includes the contents with search engines so that the website is ranked at the top of the search result page when the keyword is typed into the search engine.

Rubel et al. (2009) explained that the most general way that visitors search internet sites is through search engines, and revealed that internet users may be aware of the website in advance and learn about the information through advertising, but most internet users first search the word they want through a search engine. For this reason, search engine marketing has a priority before and after the website is built, and companies must maintain the website ranking at the top of the search engine. They proposed that companies must establish strategies that utilize search engines such as Google, Yahoo, etc., not just for searching for something, but also for providing information in order to sell their products and services by actively inducing visitors to come to their websites.

Malaga (2007) insisted that the way to get the best results from search engines is by having the target website shown at the top when it is searched, and the marketing activities, which manage the contents according to the characteristics of the search engines so that the users can easily access the website while the search result is located at the top, involve SEO.

And Ravi (2005) revealed that search engine users tend to follow the ad-

vertising sections and linkages on the search result page that they trust. But most on-line sellers prefer paid advertisements instead of investing in SEO to get the highest search result ranking on the list. Ravi explained that SEO is more expensive than paid advertisements, and the cost

marketing tool. Content composition strategy, information architecture design, search engine-friendly html preparation in order to increase exposure on search engines are typical examples.

Generally, as an essential factor for internet search, the search engine is the most popular tool. Therefore, the search result list is recognized as “pull marketing”, and sellers are very keen to advertise. In a is not appropriate and does not consistently result in the highest search result rank. This means that if the SEO cost is cheap and guarantees a consistent rank, companies should invest in it. But even though companies pay the same cost for the SEO and paid advertisements, paid advertisements may still remain an attractive marketing strategy. This study result presented the task of deciding whether the investment in paid advertisements is appropriate.

On the other hand, Byun (2004) performed an analysis of content in measuring the output order of the search engine and access possibilities through search criteria. This was part of a study related to search engines, which pointed out the problem that there is no evaluation scope or indicators to evaluate the level of SEO that exists before visiting a website and introduced the concept of SEO to enhance search effectiveness. Kim and Jeong (2009) proposed a website content design direction by establishing the evaluation scope and indicators to measure the level of SEO and testing the impact and correlation between these evaluation indicators and webpage numbers indexed to the search engine. But SEO showed a limitation in utilizing the website as an internet marketing tool by focusing on a graphic design due to insufficiency of internet marketing expertise, budget, and time, and understanding the website as an internet addition, early attempts such as banner ads, pop-up ads, and e-mail marketing promotions were utilized as “push marketing” in which users were prevented from searching based on self-preference. In terms of click through rate, the effectiveness of this marketing has declined recently. Now on-line sellers know that banner ads do not lead to the traffic they want. On the other hand, in terms of cost, they recognize that paid advertising on the search engine result pages is more effective than banner and pop-up ads.

Ravi (2005) found that the key issues regarding paid advertisements are that most buyers do not trust paid advertisements and prefer to follow the link shown in the advertisement on the search result page. Considering the buyers’ bias regarding on-line search behavior, on-line sellers may insist SEO improves their rank on the search result list instead of investing in paid

advertisement. Therefore, when the cost of SEO and paid advertisement is the same, SEO shows the higher rank on the search result page, and the paid advertisement is recognized as the best strategy for the on-line sellers.

As a result of analyzing the above studies, it is clear that most studies were limited to the advertising techniques and measurement of advertising effectiveness such as the types of internet advertising, searching methods, search registration, etc., and empirically analyzed the development of evaluation models and success factors regarding the measurement of internet marketing effectiveness. Regarding SEO, the comparative studies on search engine visualization and advertising are progressing, and they characterize the importance of the search engine in terms of overseas marketing and propose the introduction of SEO techniques. But after the introduction of SEO techniques, they did not propose detailed search engine marketing performance classified by industry and period. Therefore, this study aims to propose the search engine marketing plans that are required by academies and industries by performing time-series analysis of quantitative data classified by industry and a qualitative survey regarding the empirical analysis of search engine marketing for Korean small and medium exporting companies.

IV. Empirical Analysis and Data

The data for the analysis of this study came from companies that participated in the export supporting program that was carried out by the Korean Small and Medium Business Administration (SMBA) from 2007 through 2009, and we have implemented a quantitative data mining analysis and a qualitative survey for this analysis. The details are described in Table 1.

<Table 1> Method of Empirical Analysis

| Remarks | Analysis 1: Data Mining | Analysis 2: Survey |
|--------------------|---|---|
| Population | •394 companies | •117 companies |
| Size of Sample | •346 companies (87.8%) | •98 companies (83.8%) |
| Section of HS Code | <ul style="list-style-type: none"> •Section 6: 41 companies (11.8%) •Section 15: 30 companies (8.7%) •Section 16: 176 companies (50.9%) •Section 17: 28 companies (8.1%) •Section 18: 46 companies (13.3%) •Section 20: 25 companies (7.2%) | <ul style="list-style-type: none"> •Section 6: 10 companies (10.2%) •Section 15: 10 companies (10.2%) •Section 16: 54 companies (55.1%) •Section 17: 6 companies (6.1%) •Section 18: 13 companies (13.3%) •Section 20: 5 companies (5.1%) |

1. Data mining analysis

Data mining analysis was implemented through the homepage visitor log data analysis for the 346 companies (87.8%) that are included in Section 6¹,

Section 15², Section 16³, Section 17⁴, Section 18⁵, and Section 20⁶ of the 21 HS-Codes (Harmonized Commodity Description and Coding System) and out of the 394 companies.

We have selected the items from 6 out of the 21 sections of the HS-Codes because these products comprise the highest portion of Korea’s exports as shown in Table 2.

Looking at the 2009 export results of the target companies for analysis, Section 16, which includes electrical and electronic products and parts recorded US\$123.993 billion (34.9%) out of the total US\$363.528 billion, and Section 17 which includes vehicles, aircraft, vessels, and associated transport equipment recorded US\$80.161 billion, which comprised 22.1% of the total exports. Section 15 which includes base metals and articles of base metal, and the Section 18 which includes optical, precision, and measuring instruments recorded US\$31.528 billion (8.7%) and US\$29.446 billion (8.1%), respectively, and exports of the major 4 sections recorded US\$268.128 billion, which comprised 73.8% of total exports.

The 2009 export result of 2 digit HS-Codes in 14 sections, which was identified in the technical statistics of the overall companies, recorded US\$ 333.487 billion, which comprised 91.8% of the total exports of US\$363.534 billion. Therefore, the empirical analysis by the major 6 HS-Codes that was proposed in this study has proven to be representative of Korean export items. As of October 17, 2011, there are 206 countries or territories applying the Harmonized System worldwide⁷, representing more than 98% of world trade⁸.

<Table 2> The 2009 Export Result of Korean Companies by HS-Code (Section)

| Section | Chapter | Number of Companies (%) | US\$ Million (%) |
|---------|---------|-------------------------|------------------|
| 2 | 06-14 | 1 (0.6) | 640 (0.2) |
| 4 | 16-24 | 2 (1.3) | 2,583 (0.7) |
| 6 | 28-38 | 22 (14.3) | 20,920 (5.8) |
| 7 | 39-40 | 2 (1.3) | 23,122 (6.4) |
| 8 | 41-43 | 3 (1.9) | 791 (0.2) |

¹ Section 6: Products of the chemical or allied industries

² Section 15: Base metals and articles of base metal

³ Section 16: Machinery, mechanical appliances; electrical equipment; sound recorders, reproducers, television image, sound recorders & reproducers & parts & accessories

⁴ Section 17: Vehicles, aircraft, vessels and associated transport equipment

⁵ Section 18: Optical, photographic, cinematographic, measuring, checking, precision, medical or Surgical instruments & apparatus; clocks & musical instruments

⁶ Section 20: Miscellaneous manufactured articles

⁷ http://www.wcoomd.org/files/1.%20Public%20files/PDFandDocuments/HarmonizedSystem/HS%20Overview/Countries_applying_HS_EN_20111017rev.pdf

⁸ http://en.wikipedia.org/wiki/Harmonized_System

| | | | |
|-------|-------|------------|----------------|
| 10 | 47-49 | 1 (0.6) | 2,631 (0.7) |
| 11 | 50-63 | 1 (0.6) | 11,417 (3.1) |
| 12 | 64-67 | 1 (0.6) | 523 (0.1) |
| 13 | 68-70 | 2 (1.3) | 1,085 (0.3) |
| 15 | 72-83 | 7 (4.5) | 31,528 (8.7) |
| 16 | 84-85 | 71 (46.1) | 126,993 (34.9) |
| 17 | 86-89 | 10 (6.5) | 80,161 (22.1) |
| 18 | 90-92 | 22 (14.3) | 29,446 (8.1) |
| 20 | 94-97 | 9 (5.8) | 1,647 (0.5) |
| Total | | 154(100.0) | 333,487 (91.8) |

Source: <http://stat.kita.net> (Korea International Trade Association, Trade Statistics)

Especially, in case of Section 16, the portion of the companies (46.1%) and the portion of exports (34.9%) appeared similar, so we can indirectly understand that the major items of Korean exports are machinery, electrical and electronic products, and the management and employees are very interested in the search engine marketing.

In case of Section 17, the portion of exports is 22.1% and comprises a very high portion of total Korean exports, but the portion of companies is 6.5%, which is very low because the companies of Section 17 are mostly the finished product manufacturers of ships and automobiles, and belong to conglomerates. The reason that the direct export by SMCs is very low in Section 17 is because the SMCs mainly manufacture the parts and components for the finished products of shipbuilding and vessels. The significant price difference between the finished products and parts and components is also the reason for the lower portion of exports in Section 17. For reference, there is a very high positive correlation (0.844) that is statistically significant ($p < 0.01$) between the number of companies and exports by HS-Code.

<Table 3> The Correlation Matrix

| Variables | Number of companies | Exports |
|---------------------|---------------------|---------|
| Number of companies | 1 | |
| Exports | 0.844** | - |

** : Correlation is significant at the 0.01 level (2-tailed).

2. Survey Analysis

The target companies of this study consisted of a total of 460 companies, including 97 companies in 2007, 171 companies in 2008, and 192 companies in 2009. The first web-based survey was conducted during the period of June 17-30, 2010, and 37 surveys were collected. To enhance the low response rate, a second telephone survey was conducted during the period of July 1-20, 2010, and 143 surveys were collected. Looking at the composition of

collected survey data by year, the analysis was conducted for a total of 117 companies, including 30 companies in 2007, 35 companies in 2008, and 52 companies in 2009, which is the result of matching the target companies for qualitative analysis and survey response companies. The services had long since closed, so 2007 and 2008 showed low response rates. As a result of the re-classification of 117 companies by major industrial classification, we conducted the analysis for just the major 6 representative product categories (98 companies), including 10 companies in Section 6 (chemical industry), 10 companies in Section 15 (steel, base metal), 54 companies in Section 16 (electrical, electronic products), 6 companies in Section 17 (vehicles, aircraft), 13 companies in Section 18 (optical, precision measuring instruments), and 5 companies in Section 20 (toys, furniture).

V. Empirical Results

1. Data Mining Result

Web analytics is the measurement, collection, analysis and reporting of internet data for purposes of understanding and optimizing web usage⁹. Here, data mining analysis of this study utilized Google Analytics¹⁰ that provides the analysis data based on web traffic. Google Analytics is an enterprise-class web analytics solution that gives you rich insights into your website traffic and marketing effectiveness. Powerful, flexible and easy-to-use features now let you see and analyze your traffic data in an entirely new way. With Google Analytics, you're more prepared to write better-targeted ads, strengthen your marketing initiatives and create higher converting websites.¹¹

We should have analyzed the website archives of the 346 companies for three years (2007-2009). If we should respectively use their own data-log systems, the archives would lose reliability and consistency. Google Analytics makes it easy to present the data-log using the same criteria. However, it will not support a dynamic URL, so their data-log archives may not reflect the correct information.

We concentrated on the following analysis. First, we implemented the visitor analysis to trace the number of users who visited the target site every month during the analysis period. Visits represent the number of individual sessions initiated by all the visitors to your site. If a user is inactive on your site for 30 minutes or more, any future activity will be attributed to a new

⁹ <http://www.webanalyticsassociation.org/?page=aboutus>

¹⁰ <http://analytics.google.com>

¹¹ <http://www.google.com/analytics/index.html>

session. Users that leave your site and return within 30 minutes will be counted as part of the original session. The initial session by a user during any given date range is considered to be an additional visit and an additional visitor. Any future sessions from the same user during the selected time period are counted as additional visits, but not as additional visitors.

Second, we implemented the Pageviews¹² analysis, which is defined as a view of a page on your site that is being tracked by the Analytics tracking code. If a visitor hits reload after reaching the page, it will be counted as an additional pageview. If a user navigates to a different page and then returns to the original page, a second pageview will be recorded as well. This is an important measurement factor in order to analyze the indicators that can identify the loyalty to the target website and the visitor behavior, and to distribute advertising revenue.

Also, if someone positively recognizes the website (visits) which have various contents, they will stay for a long time at the website (pageviews). Namely the correlation between visits and pageviews is in direct proportion. The definitions and analysis criteria for each analysis are as follows.

<Table 4> A Definition of Analysis Criteria

| Analysis | Analysis Criteria | Definition |
|-----------|--------------------|----------------------------------|
| Visitors | All Visitors | All Visitors of Website |
| Visitors | New Visitors | New Visitors of Website |
| Visitors | Returning Visitors | Returning Visitors of Website |
| Pageviews | All Visitors | Pageviews for All Visitors |
| Pageviews | New Visitors | Pageviews for New Visitors |
| Pageviews | Returning Visitors | Pageviews for Returning Visitors |

Source: Lee, S. J. and Kang, H. W. (2009), "An Empirical Study on the Internet Marketing Performance of Exporting Companies using Search Engine," *The Journal of Internet E-Commerce Research*, Vol. 9, No. 4, p. 399

The data mining analysis of this study analyzed the homepage log data of target companies for 13 months (D+12) from the base time (D).

1) Visitors Analysis

(1) All Visitors

In Figure 1, we traced the overall visitors analysis data of 6 sections based on HS-Code for a total of 13 months. Looking at Sections 6, 17 and 18 first, we can see that similar visitor trends appear for the whole period. In general, average monthly visitors increased at D+2 compared to the previous month and reached the peak at D+5. For 3 months after that, the average monthly visitors recorded over 500 visits and then declined to 300 visits until

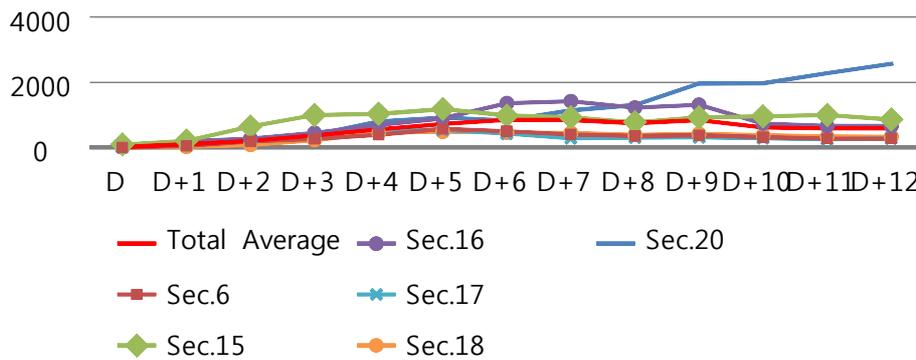
¹² Pageviews or page impressions are requests to load a single HTML file of an Internet site. http://en.wikipedia.org/wiki/Page_view

D+10, while showing moderate fluctuations compared to the other sections. However, after D+6, the visitors recorded fewer visits than the analysis average (750 visits for total, 500 visits for Sections 6, 17, and 18), so we need to analyze the characteristics of the industries.

First, these items are comprised of the chemical industry in Section 6, vehicles and aircraft in Section 17, and optical and precision measuring instruments in Section 18, and show the following characteristics by section. First, these sections involve large volume purchases in terms of quantity due to the characteristics of the transaction, and large transaction amounts. Second, sellers and buyers are fixed and may possibly have long-term trade relationships. Third, due to the characteristics of the production technology, they are comprised of the basic science area (Section 7), capital and facilities industry (Section 17) and high-tech industry (Section 18), so competitors equipped with a certain level of production facilities cannot appear in a short period of time, and production and export system are established for large companies, not for SMCs. Therefore, the basis of domestic SMCs with capabilities to produce and export these items is very weak, and we can see the fixed vertical integration of industrial structures between large companies and SMCs where the SMCs supply the related parts to the large companies.

On the other hand, in the case of Sections 15, 16, and 20, the items recorded higher average monthly visits than the overall average during the analysis period. The characteristics by item are as follows.

<Figure 1> Visitors Analysis about All Visitors per month



The items in Section 15 (steel, base metal) recorded the highest visits in the shortest period of time (D+3) among the items for analysis, and were determined to be the items that can enjoy the marketing effects through search engines in a short period of time. Looking at the trend of the whole period of analysis, since recorded average monthly visits of 1,000 at D+3, they had

the least fluctuation until D+12, the end of analysis. After modifying the homepage appropriately for search engines, we have found that the carryover effect lasted for more than 6 months.

The items in Section 16 (electrical and electronic products) as a representative industry comprised 35% of the total Korean exports in 2009 and also comprised 46.1% (71 companies) of this analysis. The visitors reached the level (approximately 900 visits) slightly above the overall average (approximately 750 visits) until D+5, but rapidly increased to 1,400 visits from D+6. We can see that there was a carryover effect for 4 months until D+9. However, after D+10, average monthly visitors remained at the level of overall average (approximately 600 visits), and there was a rapid decrease of the carryover effect.

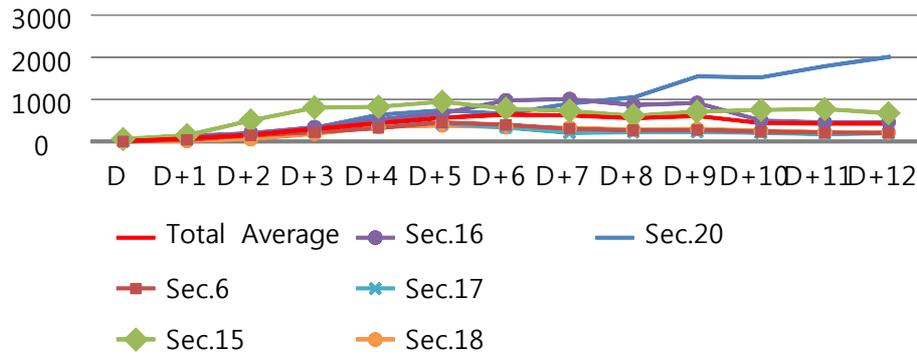
The items in Section 20 (toys, furniture) showed the highest effect of the support project during the overall analysis period. They remained at the average level until D+6, but the growth trend lasted until the end of the analysis after beginning in D+7. On the other hand, there are only 25 companies to analyze, which comprise just 6.3% of the overall analysis and just 0.5% (US\$1.6 billion) of the total exports. Their weight in the industry is very low, but marketing strategy utilizing search engines as an export marketing tool of the items seems to be working.

(2) New Visitors

Looking at the weight of new visitors among the overall visitors analysis, it showed a similar trend to the graph of all visitors analysis in Figure 1. Analyzing this trend, most visitors approaching the website are new visitors, and inviting new visitors plays a key role in increasing the overall visitors to the website.

In the case of Section 20, the support period of SEO service is over, and a continuous increase of returning visitors seems to be very rare. The overall average number recorded was approximately 480 visits at D+4, and the fluctuation is moderate until D+12. This means that we have to consider the utilization of other ancillary means of search engine marketing, such as search engine advertisements and contents network advertisements.

<Figure 2> Visitors Analysis of New Visitors

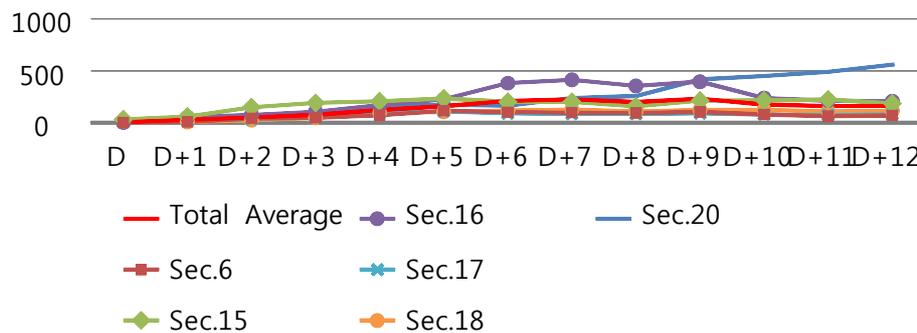


(3) Returning Visitors

The measurement of returning visitors means repetitive and periodic visits to the website. They are the potential customers with high loyalty, considering their purchase behavior. In addition, we can indirectly understand that homepages with high visits by returning visitors may include more fixed buyers and loyal customers.

In the case of Section 20, the visits of returning visitors maintained an average level until D+8, rapidly increased after D+9, and reached average monthly visits of approximately 580. In the case of Section 16, the visits included an average monthly count of 400 visits, slightly above the 4 month average, and then decreased to the average level. They seem to need continuous control after the official SEO service.

<Figure 3> Visitors Analysis of Returning Visitors



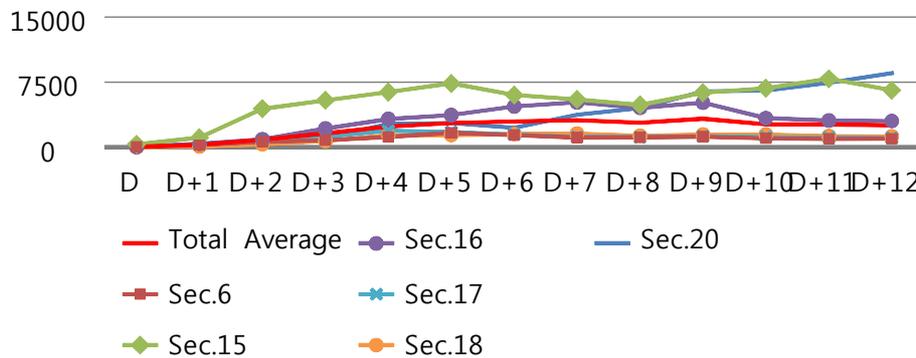
2) Pageviews analysis

(1) All Visitors

The items in Section 15 (steel, base metal) exceeded the monthly average of approximately 1,000 pageviews (pvs) at D+1, and since then have recorded an explosive increase and reached a monthly average of approximately 7,400 pvs at D+5. High pageviews mean high interest from potential visitors, and can be interpreted as similar to returning visitors in the visitors analysis. In other words, the web site has extensive contents, and the information in the website induces the repetitive clicks of the visitors.

In the case of Section 20, it shows a similar trend as the visitors analysis, with the maximum level at D+12, which is a monthly average of over 8,700 pvs. In the case of Section 16, it recorded the pageviews of approximately 5,000 pvs, which significantly exceeds the average of D+4 through D+10.

<Figure 4> Pageviews analysis about All Visitors per month



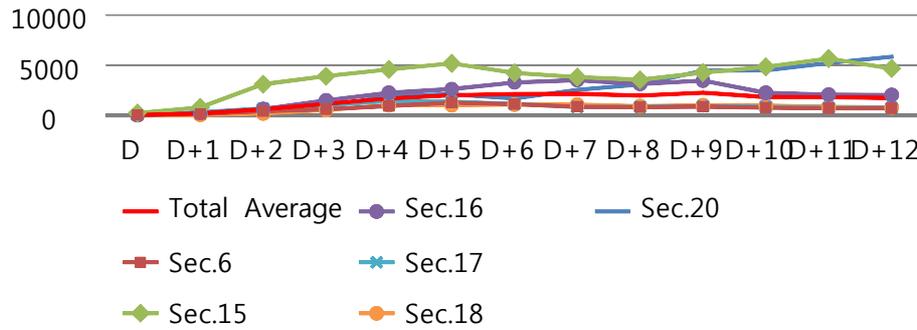
(2) New Visitors

The pageviews of new visitors, which comprise over 70% of the overall pageviews, structurally show a similar trend to Figure 4.

In the case of Section 16, it shows a rapid downtrend starting with D+9, meaning the sector was directly influenced by the decrease of new visitor inflow. In order to overcome these results, it is necessary to utilize the ancillary search engine marketing tools such as search advertisements that need a continuous inflow of new visitors.

Sections 6, 17, and 18 show the results below of the average pageviews of new visitors due to a structural process difference between the items and marketing effectiveness of search engines as is the case of visitors analysis.

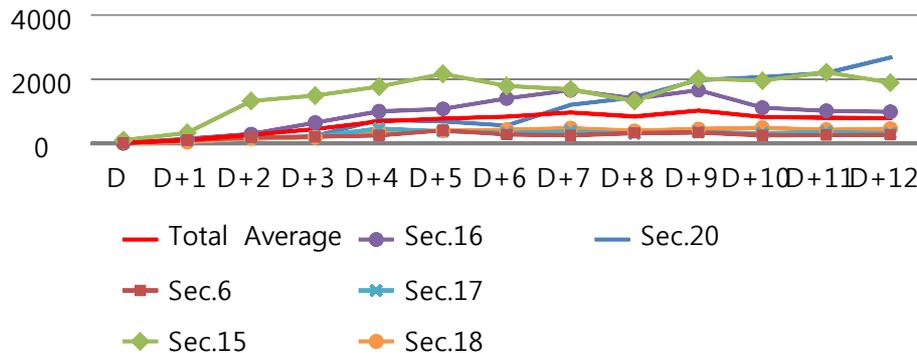
<Figure 5> Pageviews analysis of New Visitors



(3) Returning Visitors

The average monthly pageviews by returning visitors comprise 30% of the total average monthly pageviews. The accurate measurement and periodic monitoring of pageviews by returning visitors need to be connected to the real transactions through repetitive visits. It is assumed that returning visitors already recognize the address of the website and the products and services of the company. Furthermore, in establishing a process that actively recommends the products and services of the website by attracting these returning visitors, we can make sure that it will be connected to the actual purchases.

<Figure 6> Pageviews analysis of Returning Visitors



The above results are summarized as follows.

First, search engine optimization led to an increase in the number of visitors and pageviews. If many visitors come into their websites, they have a high possibility that they can achieve export contracts. However, the duration of effects lasts approximately eight months. After eight months, growth shows a decreasing trend. The reason for this is due to SEO's competition becoming

worse and the advertising service of search engines is evolving more advanced techniques.

Second, in the case of Section 20, it shows a sustained growth because they have been transacting general customers rather than specific customers. Namely, the former have B2C customers and the latter have B2B customers.

The weakness of the data mining analysis cannot measure the SEO's performance using quantitative methods. Therefore, this study targeted companies which have already done the SEO and the survey analysis can verify the difference of perceptions between the two analyses.

2. Survey Result

1) Homepage satisfaction compared to the competitors before the service

According to the satisfaction evaluation for the English homepages of the SMCs compared to the domestic and overseas competitors, 60% (59 companies) of respondents were 'very satisfied' and 'satisfied', and 40% (39 companies) 'very dissatisfied' and 'dissatisfied'. It was revealed that respondents were generally satisfied with the quality of the homepages of SMCs. This outcome is the result of the continuous support from the government and trade organizations in the homepage production project that was launched in order to support the overseas marketing of SMCs over the past 10 years.

On the other hand, companies that responded 'dissatisfied' were 40%. This is very high because homepage production does not reflect the characteristics of the company and was simplified and modularized as a 'government and related organization support project'. Therefore, in the future, we need to find a direction to enhance the satisfaction of the support project by producing 'customized homepages' that reflect the characteristics of the companies.

By industrial classification, 'very satisfied' and 'satisfied' are high for Section 16 (electrical, electronic products), Section 17 (vehicles, aircraft), Section 18 (optical, precision measuring instruments), and Section 20 (toys, furniture), 'dissatisfied' and 'very dissatisfied' are high only for Section 6 (chemical industry), and 'satisfied' and 'dissatisfied' are the same for Section 15 (steel, base metal).

<Table 5> Homepage Satisfaction compared to the Competitors

| Section | Number of Companies | Very satisfied | Satisfied | Dissatisfied | Very dissatisfied |
|---------|---------------------|----------------|-----------|--------------|-------------------|
| 6 | 10 | NA | 4(40%) | 5(50%) | 1(10%) |
| 15 | 10 | NA | 5(50%) | 4(40%) | 1(10%) |
| 16 | 54 | 2(4%) | 30(56%) | 20(37%) | 2(4%) |
| 17 | 6 | NA | 6(100%) | NA | NA |
| 18 | 13 | NA | 9(69%) | 4(31%) | NA |
| 20 | 5 | 1(20%) | 2(40%) | 1(20%) | 1(20%) |
| Total | 98 | 3(3%) | 56(57%) | 34(33%) | 5(7%) |

2) Homepage awareness and discovering new buyers after the service

After the service, of the total respondents for homepage awareness, ‘very increased’ and ‘increased’ (82%, 83 companies) were higher than ‘very decreased’ and ‘decreased’ (28%, 15 companies), and SMCs recognized that search engine marketing services have the effect of increasing homepage awareness.

By industrial classification and classified as minority opinions, there were responses that homepage awareness was ‘very increased’ in Section 16 (electronic, electrical products) and Section 18 (optical, precision measuring instruments). On the other hand, there were responses that homepage awareness was ‘very decreased’ in Section 6 (chemical industry) and Section 16 (electronic, electrical products). Section 16 (electronic, electrical products) had a minority opinion of both ‘very increased’ and ‘very decreased’.

Regarding the search engine marketing service provided by the SMBA, the survey responses about the service’s helpfulness in discovering opportunities were as follows: 52% (53 companies) of the respondents listed ‘very helpful’ and ‘helpful’, 33% (34 companies) ‘no change’, and 11% (11 companies) showed ‘not helpful at all’ and ‘not helpful’. Of the companies that applied for the search engine marketing service, 52% said that the service had a positive effect in discovering new buyers. However, the companies that responded with ‘no change’, ‘not helpful at all’ and ‘not helpful’ (48%, 45 companies) had a negative view of the effectiveness of discovering new buyers, so we need to review the overall effect of the search engine marketing service from various aspects. By industrial classification, ‘very helpful’ and ‘helpful’ were high in Section 6 (chemical industry), Section 16 (electronic, electrical products), Section 18 (optical, precision measuring instruments), and Section 20 (toys, furniture), and ‘no change’ rate was high in Section 15 (steel, base metal) and Section 17 (vehicles, aircraft).

<Table 6> Homepage Awareness after Search Engine Marketing Service

| Section | Number of companies | Very decreased | Decreased | Increased | Very increased |
|---------|---------------------|----------------|-----------|-----------|----------------|
| 6 | 10 | 1(10%) | NA | 9(90%) | NA |
| 15 | 10 | NA | 1(10%) | 9(90%) | NA |
| 16 | 54 | 1(2%) | 10(19%) | 42(78%) | 1(2%) |
| 17 | 6 | NA | NA | 6(100%) | NA |
| 18 | 13 | NA | 1(8%) | 11(85%) | 1(8%) |
| 20 | 5 | NA | 1(20%) | 4(80%) | NA |
| Total | 98 | 2(2%) | 13(26%) | 81(80%) | 2(2%) |

<Table 7> Helpfulness in Discovering New Buyers after Search Engine Marketing Service

| Section | Number of companies | Not helpful at all | Not helpful | No change | Helpful | Very helpful |
|---------|---------------------|--------------------|-------------|-----------|---------|--------------|
| 6 | 10 | NA | NA | 3(30%) | 7(70%) | NA |
| 15 | 10 | 1(10%) | NA | 5(50%) | 4(40%) | NA |
| 16 | 54 | 5(9%) | 4(7%) | 19(35%) | 25(46%) | 1(3%) |
| 17 | 6 | NA | NA | 3(50%) | 3(50%) | NA |
| 18 | 13 | NA | NA | 4(31%) | 7(54%) | 2(15%) |
| 20 | 5 | 1(20%) | NA | NA | 3(60%) | 1(20%) |
| Total | 98 | 7(7%) | 4(4%) | 34(33%) | 49(48%) | 4(4%) |

3) Receiving channels of overseas inquiries

On the question of channels through which small and medium-sized enterprises (SMEs) that receive overseas marketing services receive inquiries from abroad, the results were as follows: 'search engine' and 'receiving through homepage' (57%, 55 companies), 'off-line exhibition/trade mission' and 'personal network' (39%, 39 companies). Until now, overseas marketing tools that receive inquiries from overseas buyers included both 'on-line' and 'off-line' channels, and a combination of on- and off-line channels would have a better effect. By industrial classification, it was unusual that in Section 18 (optical, precision measuring instruments), inquiries through 'exhibition/trade mission' (46%, 6 companies) were higher than inquiries through 'search engine and homepage' (38%, 5 companies). Until now, many companies first consider the off-line based marketing channel and utilize exhibition/trade missions with a limited marketing budget.

<Table 8> Receiving Channels of Overseas Inquiries

| Section | Number of companies | Search engine | Homepage | Others | Personal network | Exhibition/ Trade mission |
|---------|---------------------|---------------|----------|--------|------------------|---------------------------|
| 6 | 10 | 5(50%) | 1(10%) | NA | NA | 4(40%) |
| 15 | 10 | 4(40%) | 2(20%) | 1(10%) | NA | 3(30%) |
| 16 | 54 | 19(35%) | 11(20%) | 2(4%) | 5(9%) | 17(31%) |
| 17 | 6 | 3(50%) | 1(17%) | NA | 1(17%) | 1(17%) |
| 18 | 13 | 3(23%) | 2(15%) | 1(8%) | 1(8%) | 6(46%) |
| 20 | 5 | 3(60%) | 1(20%) | NA | NA | 1(20%) |
| Total | 98 | 37(37%) | 18(20%) | 4(4%) | 7(7%) | 32(32%) |

4) Changes in number of inquiries after the service

On the survey of inquiries from overseas buyers regarding major products of the SMEs that used search engine marketing services, it was revealed that search engine marketing was somewhat effective with the result of 'increase of inquiries' (60%, 61 companies) and 'no change' (40%, 37 companies).

By industry, for the survey of the number of overseas inquiries for the 98 companies, considering a search engine marketing service period of 6 months, it was revealed that the monthly average of 1 overseas inquiry was received with the result of ‘less than 5 inquiries’ (52%, 52 companies) and ‘less than 5-10 inquiries’ (26%, 26 companies). This is similar to the inquiry receiving rate of target marketing through e-C/L (Circular Letter) issues in the electronic trade B2B marketing. However, the difference with B2B marketing is that this is not the potential buyer by buyer DB, but the overseas inquiry by discovering new buyers.

By industrial classification, it is unusual that in Section 20 (toys, furniture), the number of inquiries received was highest at ‘less than 10-20’ (60%), and in Section 15 (steel, base metal) and Section 16 (electronic, electrical products), the number of inquiries received was lowest at ‘less than 5’ (60%).

<Table 9> Increase and Number of Overseas Inquiries

| Section | Number of companies | No change | Increase | Average monthly inquiry number | | | |
|---------|---------------------|-----------|----------|--------------------------------|----------|----------------|-------------|
| | | | | Less than 10-20 | Above 20 | Less than 5-10 | Less than 5 |
| 6 | 10 | 3(30%) | 7(70%) | 1(10%) | 1(10%) | 4(40%) | 4(40%) |
| 15 | 10 | 3(30%) | 7(70%) | 1(10%) | NA | 3(30%) | 6(60%) |
| 16 | 54 | 24(44%) | 30(56%) | 8(15%) | 1(2%) | 10(19%) | 35(65%) |
| 17 | 6 | 2(33%) | 4(67%) | NA | NA | 4(67%) | 2(33%) |
| 18 | 13 | 4(31%) | 9(69%) | 4(31%) | NA | 5(38%) | 4(31%) |
| 20 | 5 | 1(20%) | 4(80%) | 3(60%) | 1(20%) | NA | 1(20%) |
| Total | 98 | 37(40%) | 61(60%) | 17(17%) | 3(3%) | 26(26%) | 52(52%) |

5) Search channels of homepage visitors

On the survey of search channels of homepage visitors that the SMEs possess, the SMEs’ responses were: ‘visit through search engine’ (67%, 67 companies), ‘typing in directly’ in web address box (9%, 9 companies), ‘linkage from other sites’ (4%, 4 companies), and ‘visit through overseas exhibition’ (18%, 18 companies). Therefore, search engine marketing (80%, 80 companies) proved to be the most definite way to increase the number of homepage visitors.

By industrial classification, it is unusual that in Section 18 (optical, precision measuring instruments), the respondents of ‘exhibition/trade mission’ were 6 people (46%) in the previous survey, and answered that the inquiry receiving channel through ‘exhibition/trade mission’ was more than the receiving channel through ‘search engine and homepage’ (5 companies, 38%). In this item, the visit of visitors through overseas exhibitions was 4 people (31%) and appears to be higher than the average visit rate (20%) of other items.

<Table 10> Search Channels of Homepage Visitors

| Section | Number of companies | Search Engine | Typing in directly | Linkage from other site | Overseas exhibition |
|---------|---------------------|---------------|--------------------|-------------------------|---------------------|
| 6 | 10 | 8(80%) | NA | NA | 2(20%) |
| 15 | 10 | 7(70%) | 1(10%) | NA | 2(20%) |
| 16 | 54 | 37(69%) | 7(13%) | 2(4%) | 8(15%) |
| 17 | 6 | 5(83%) | NA | NA | 1(17%) |
| 18 | 13 | 7(54%) | 1(8%) | 1(8%) | 4(31%) |
| 20 | 5 | 3(60%) | NA | 1(20%) | 1(20%) |
| Total | 98 | 67(67%) | 9(9%) | 4(4%) | 18(18%) |

6) Evaluation of search engine optimization

The SMEs that responded to the survey answered 'very necessary' and 'necessary' (77%, 76 companies) on the evaluation for the necessity of SEO. This constitutes a majority of the respondents agreeing on the necessity of SEO. However, we need to look over the analysis of why the respondents who answered 'not necessary' (23%, 21 companies) have negative opinions on search engine marketing. Because the SMEs lack the expertise to directly implement SEO, they must request the work from professional companies. Therefore, for some companies that failed to verify the effect, increasing costs caused the negative response for the necessity of SEO.

By industrial classification, the average of 'not necessary' is 23%, and the product categories above the average are Section 16 (electronic, electrical products) 26% and Section 18 (optical, precision measuring instruments) 23%. However, they are within the margin of error, so it is difficult to give other meanings.

Next, on the evaluation of the period of SEO, 'change when needed' (51%, 50 companies) appeared the most, which means there is a lack of recognition regarding an accurate period, and the respondents of '1 year' (23%, 22 companies) and '2 years' (13%, 13 companies) were larger than the respondents of '3 years' and '6 months'.

By industrial classification, Section 15 (steel, base metal) 30% and Section 20 (toys, furniture) 20% showed lower rates than the total average of 'change when needed' (51%). In addition, the minority opinion product categories that answered the period of '3 years' were in Section 6 (chemical industry), Section 15 (steel, base metal), Section 16 (electronic, electrical products), Section 17 (vehicles, aircraft), and Section 18 (optical, precision measuring instruments); therefore, we can see that there is an opinion on long-term SEO.

<Table 11> Necessity of Search Engine Optimization

| Section | Number of companies | Very necessary | Necessary | Not necessary | Not necessary at all |
|---------|---------------------|----------------|-----------|---------------|----------------------|
| 6 | 10 | 2(20%) | 6(60%) | 2(20%) | NA |
| 15 | 10 | NA | 8(80%) | 1(10%) | 1(10%) |
| 16 | 54 | 7(13%) | 33(61%) | 14(26%) | NA |
| 17 | 6 | NA | 5(83%) | 1(17%) | NA |
| 18 | 13 | 3(23%) | 7(54%) | 3(23%) | NA |
| 20 | 5 | 1(20%) | 4(80%) | NA | NA |
| Total | 98 | 13(13%) | 63(64%) | 21(22%) | 1(1%) |

<Table 12> Period of Search Engine Optimization

| Section | Number of companies | 1 year | 2 years | 3 years | 6 months | Change when needed |
|---------|---------------------|---------|---------|---------|----------|--------------------|
| 6 | 10 | 1(10%) | 3(30%) | 1(10%) | NA | 5(50%) |
| 15 | 10 | 5(50%) | NA | 2(20%) | NA | 3(30%) |
| 16 | 54 | 9(17%) | 8(15%) | 3(6%) | 4(7%) | 30(56%) |
| 17 | 6 | 2(33%) | NA | 1(17%) | NA | 3(50%) |
| 18 | 13 | 3(23%) | NA | 1(8%) | 1(8%) | 8(62%) |
| 20 | 5 | 2(40%) | 2(40%) | NA | NA | 1(20%) |
| Total | 98 | 22(23%) | 13(13%) | 8(8%) | 5(5%) | 50(51%) |

<Table 13> Effect of Search Engine Optimization

| Section | Number of companies | 1 year | 3 months | 6 months | Not measurable | No effect |
|---------|---------------------|---------|----------|----------|----------------|-----------|
| 6 | 10 | 4(40%) | NA | 1(10%) | 5(50%) | NA |
| 15 | 10 | NA | 3(30%) | NA | 6(60%) | 1(10%) |
| 16 | 54 | 7(13%) | 6(11%) | 4(7%) | 31(57%) | 6(11%) |
| 17 | 6 | 1(17%) | NA | 1(17%) | 4(67%) | NA |
| 18 | 13 | 2(15%) | 1(8%) | 3(23%) | 6(46%) | 1(8%) |
| 20 | 5 | 1(20%) | 1(20%) | 1(20%) | 2(40%) | NA |
| Total | 98 | 15(16%) | 11(11%) | 10(10%) | 54(55%) | 8(8%) |

On the evaluation of the effect of SEO by the SMEs that responded to the survey, the SMEs that answered ‘not measurable’ (55%, 54 companies) are a majority. The SMEs raised homepage awareness through the search engine marketing services and received inquiries from the new buyers. They positively evaluate the ‘qualitative effect’ of SEO, but answered that they cannot accurately measure the ‘quantitative’ effect. In the future, search engine marketing service providers need to make the service beneficiary company measure an accurate ROI (Return on Investment) with more quantitative indicators.

By industrial classification, the opinion of ‘not measurable’ shows a response below the total average with the result of Section 18 (optical, precision measuring instruments) 46% and Section 20 (toys, furniture) 40%, but

they are within the margin of error of the total average, and there seems to be no difference between products.

VI. Conclusion

This study aimed at examining marketing performance measures using data mining and survey analysis. This research utilized the log data of 346 companies for data mining analysis based on Google Analytics, in order to measure the performance of search engine marketing of small and medium exporting companies, and for a more reliable analysis, implemented the verification through the survey about the performance of search engine marketing for 98 out of the target companies (346 companies). Meanwhile, we have selected the target companies from 6 sections because these product categories comprise 91.8% (2009) of the total export items of Korea.

First, as a result of the data mining analysis that traced the analysis data of overall visitors of 6 items based on the HS Code for a total of 13 months, homepage visitors and pageviews of all companies increased after SEO. The companies in Sections 15, 16, and 20 especially showed above average results. The items of Section 15 (steel, base metal) were analyzed as items that showed marketing results in a short period of time after SEO by recording the highest visitor result in the shortest period of time of the target items for analysis. The visitors analysis of items in Section 16 (electronic, electrical products) showed the level slightly above the total average until D+5, but after D+6, recorded an increase of approximately 1,400 visitors. The items in Section 20 (toys, furniture) showed the highest effect of the support project during the overall analysis period. They remained at the average level until D+6, but the growth trend lasted until the end of the analysis from D+7. The marketing strategy utilizing search engines as export marketing tools of the target items seems to be working.

Second, as a result of the survey analysis, 82 companies (82%) responded that after SEO service, their homepage awareness increased. This means that the companies perceived an increase of homepage visitors through the data mining analysis. To the question of the inquiry increase related to the product inquiry from the overseas buyers, 61 companies (60%) responded 'increased', and to the question of the necessity of the SEO of their homepages, 76 companies (77%) responded 'necessary'. Therefore, search engine marketing proved to be a new marketing channel. For the companies in Sections 15, 16, and 20 that showed the above average result from the data mining, we had difficulties in finding a trend of especially high satisfaction for these companies in the survey because the companies that were committed to the survey

were only 26% of the companies that committed to the data mining analysis.

In the 21st century's information-oriented era where extreme competition is standard, in order to utilize the on- and off-line worlds harmoniously and implement successful overseas marketing, small and medium exporting companies need to gradually decrease their dependence on traditional old media, and rapidly expand their dependence on the new media such as search engines (Google, Yahoo, and Bing), SNS, blogs, etc. From among these methods, export marketing through SEO is the representative marketing tool of the new media marketing channel that takes immediate effect by utilizing the limited marketing resources of small and medium exporting companies and brings flexible realization and successful results according to overseas marketing strategies.

SEO is an effective solution for the win-win strategy of the Korean government. However, looking at the marketing support policy for SMCs of the government, it is still focused on high-cost field marketing strategies, such as exhibitions and expos, which are more suitable for large and global companies. Even though the SMEs participate in the overseas exhibitions that the government supports, the standard booth cannot present the characteristics of the company, and the high participation expenses are not able to provide significant merit to the SMEs. The marketing technique to overcome this environment is SEO.

As we can see, homepage visitors of all companies increased after SEO. Marketing through SEO enables the measurement of ROI through visitor and traffic analysis. Because potential customers with high purchasing power can be brought in, SEO is a very useful marketing strategy with which the SMEs can obtain real performance and is a policy that needs active expansion and implementation.

Finally, this study has a significance in that the result of the analysis on overseas marketing performance using SEO by 6 representative business sectors has empirically proved that appropriately optimizing the company's homepage to search engines brought the increase of visitors and pageviews, and consequently, an increase in inquiries, which is the actual expression of purchase intent, and was a great help to the export marketing of SMCs.

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