Development of CMS- and SEO-based *CYBER CLUSTER E-COMMERCE* Model for SME Products

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ABSTRACT: *Problems often experienced by SMEs are the limited number and coverage of their product marketing and sales. Likewise, the similar product competition can occur among local products or products coming from outside. This is because marketing and sales are still performed conventionally and individually. This study intends to implement a model of E-Commerce system for SME products in a region or District with cyber cluster participatory in the linking web which is developed using Search Engine Optimization (SEO) system and Content Management System (CMS). The purpose is that the developed web can easily reach top rank in the web search engines and the content and rank can be always updated. The benefits of this study is to improve marketing and sales of SME products into global market and to make the said web address is easy to find and easy to search because they often appear in the top positions in search engines like Google.*

The output of this study is SME product website which is based on CMS and optimized with internal and external link model that always appear at the top position in search range. This study method used action research, with waterfall-structured system development model. The application of the web itself was developed with a prototype model, according to the consumer needs.

KEYWORDS: *Cyber-Cluster, SEO, CMS, SMEs*

I.   INTRODUCTION

Small and Medium Enterprises (SMEs) are many and spread in each region or District in Indonesia, but they have not been able to develop with cheering results. The number of SMEs in 2011 was 55.2 million units with employment absorbance between 3-5 persons. It shows development compared in 2008 which was only amounted to 51.3 million SMEs [1]. Of that number, only about 83,000 or about 0.15 percent of SMEs in Indonesia in 2012 have had their own website to promote their business online. In fact, the Internet users in Indonesia are more than 40 million people, and 130 million people use online access via cell phones [2].

Most of SMEs have a major problem i.e the limited quality of Human Resources (HR) and the weak business networks and ability to penetrate market [3]. It means that most of SMEs are lack of qualified human resources in the business development, and their sales and marketing systems are still conducted conventionally. There are still few SMEs utilizing Information Technology (IT) infrastructure to support their business such as for marketing and selling on-line via internet or better known as Electronic Commerce (E-Commerce). In fact, one of keys for the success of SMEs is the availability of broad and clear market for their products. Meanwhile, the fundamental weakness faced by SMEs in the terms of marketing is the low market orientation, the weak position in the complex and tight competition and inadequate marketing infrastructure. To face the increasingly open and competitive market mechanisms, market share is a prerequisite to improve the competitiveness [4].

For the development of SME market, an effective, easy, and inexpensive marketing strategy is required to expand market access through the provision of web-based information technology facilities with Content Management System or CMS method in order to facilitate the use and admission of website materials, and

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Search Engine Optimization (SEO) methods in order to make this website always in the top rank or in the first page of internet search engine so that consumers find the website address easily. Therefore, it is expected that SMEs can obtain various advantages in promoting or marketing their business, making sales transaction, and communicating other business globally, in order to expand their business network.

Search Engine Optimization (SEO) is a series of processes performed systematically in order to improve the volume and quality of visit traffic via search engines to a particular website 'by utilizing the mechanism or algorithm of such the search engine. The purpose of SEO is to place a website on the top position, or at least in the first page of search results based on certain targeted keywords. Logically, a website occupying the top position in search results has a greater chance to get visitors [5].

The previous study has resulted models of identification, analysis, and CMS- and SEO-based web design on each web cluster being established. The result is a model of analysis and web design having CMS and SEO features in each SME cluster. The study shall be continued with the implementation of CMS- and SEO-based web and further testing [6]. Therefore, it is necessary to conduct advanced study in the form of multi-cluster CMS and SEO modeling and its implementation to increase the effectiveness of CMS and SEO to all SME cluster in a region or District. This research focuses on the implementation model of CMS- and SEO-based SME web with multi-cluster system in a region or District.

II. STUDY METHOD

2.1. Study Object and Materials

The object of this study is SMEs that are members of *Paguyuban* (Association) "Kendal Permai" under the guidance of Department of Cooperatives and SMEs of Kendal. Furthermore, SMEs are divided into several clusters according to the similar type of products and/or according to the existing cluster (already established). The group in this study is divided into five (5) clusters; they are culinary cluster, handicraft cluster, bag and suitcase cluster, tourism cluster, and general cluster. Each cluster will be provided with a CMS- and SEO- based website. Each cluster website will contain a model of product e-commerce according to the type of cluster. General cluster contains the culinary cluster products accompanied with information or articles on the potential economic and trade in Kendal. Meanwhile, tourism cluster will be added with information or articles on to the potential natural and artificial tourism objects and shopping tourism.

Based on the primary data stated by the Chief BDS (Business Development Staff) District of Kendal, SMEs that are members of "Kendal Permai" until the end of 2013 were 97 of about 800 SMEs included in the five clusters in District of Kendal. In this study, 97 SMEs were grouped into five clusters, 7 to 12 samples were taken from each cluster whose products are displayed or sold in the Counter of Paguyuban (Association) "Kendal Permai" to be used as the study material. The data on products taken and used as study material is profile of each product which includes the product name, weight, materials, photos, prices, discounts, and some products need specification or particular description for example expired date for food, product area or volume. In addition, other general data is also required such as address, contact person, and public profile. Each cluster is provided with a web with domain name as its cluster name or identity.
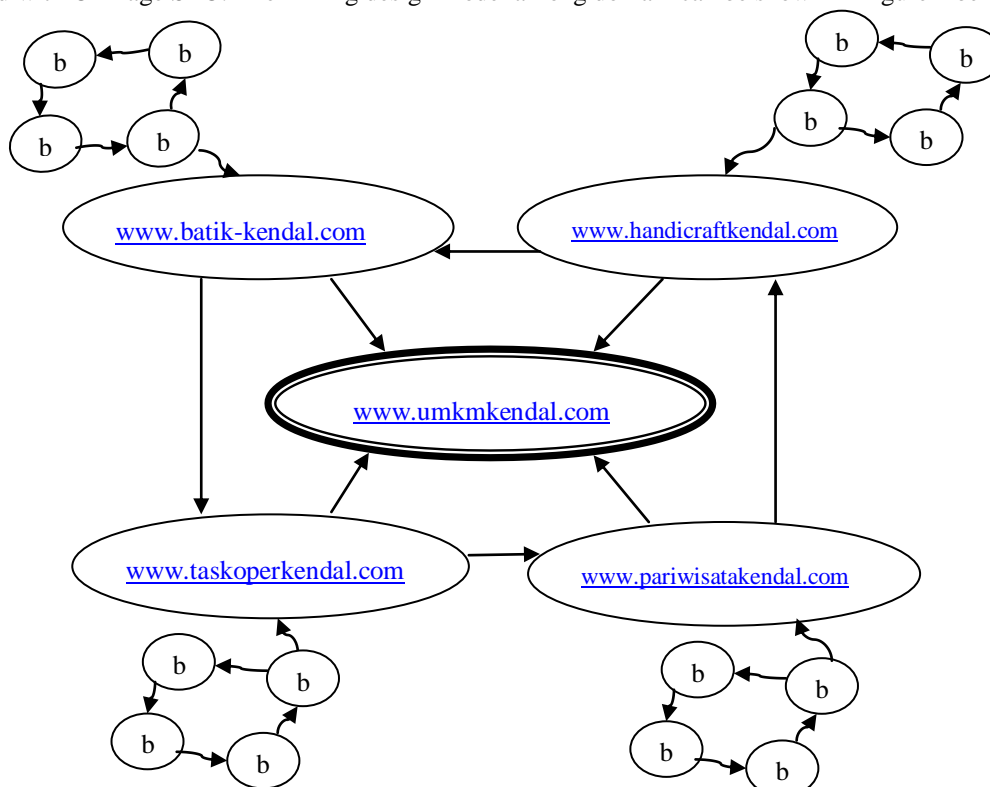
2.2. *Architecture Model and Development Design*

Architectural model developed in this study is to produce a SEO-based model by integrating the created or developed website through On-Pages and Off-Pages link or back-link [7]. On-Pages Link was developed with CMS-based website system i.e by enabling web features being possessed. Technique that can be used to enable web features is naming domain which is suitable with the web topic, Title Tag, Heading tags, meta tags, description [8], giving **title** attribute to each *anchor text* and image, internal linking. Off-pages link is carried out by back-link activity, i.e a link from other blog or website or blog. A back-link is like a recommendation, the more recommendation for a website, the more attention will be obtained by a website from search engines, therefore, we must actively promote the existence of the created website. Techniques that can be implemented

are using social media (Facebook, Twitter or Google Plus, and a like), registering or joining in discussion forums, Submitting directory/ submitting sitemap to webmaster tools, ping blog, making attractive articles.

From five SME clusters described above, five websites or domains with one domain as the principal website, and four domains as endorser websites were developed. Between one principal website with four endorser websites, there are connectedness through *links* and *backlinks* either On-Pages or Off-Pages. The *link* was established by writing the domain name which was directly linking it to the other websites (four other websites). Principal website and endorser websites mutually put the name of its partners' websites (both principal and endorser) that was automatically linking to the website so that interlink was formed between the said websites. Meanwhile, *backlink* can be conducted either by internal links and external links. Internal link is performed from one content to another or content contained in the same website or domain. External link perform link process from one website to another with the penetration process to other websites through regulation of external backlinks.

The next step was making website or domain interconnection design between principal domain, endorser domains, and domains which are not involved directly to the link (indirect-link). Domain name that can be accessed through URL is determined as follows; principal domain name is umkmkendal.com, endorser domain name is batik-kendal.com, handicraftkendal.com, pariwisatakendal.com, and taskoperkendal.com. While the code with letter b in the circle (b) is another website undergoing *back-link* transaction process with model Off-Page SEO. Each principal and endorser domain was provided with CMS model and its content is equipped with On-Page SEO. The linking design model among domain can be shown in Figure 1 below.

Figure 1 Model of SME *Linking* Process Design

In Figure 1 above, it can be explained that each endorser website performing back-link process with rotating or ring mechanism for the same level (endorser website). Meanwhile, each endorser website will make back-link process that is directed to the principal website. This mechanism also applies to other websites that are not directly linked (indirect-link).

CMS is designed using WordPress software and developed using PHP *framework* CI application to enrich features and to improve the functional effectiveness of CMS itself. The programming utilization is more prioritized for *back-end* operation which is very useful for administrators who will perform supervision, control, and manipulation of data and the CMS database itself. Meanwhile, *front-end* operation is more used by users who will perform additions, deletions, and changes to content in accordance with the authority granted by administrator.

Concept created in Figure 1 above has been developed from the design of its CMS and SEO. HomePage design can be divided into three main parts: header, content, and footer. Header includes information on logo and title, social media, web menu, search of products available on the website, and banner (slider). Content consists of left and right sections. The left section contains submenu in the form of user and administrator login submenu, search by category and order, information on best-selling products, testimonials, news or articles, and partners. In particular, Partner is interlink between endorser websites and principal website. The right section contains information on products presenting pictures of products, title of products, specifications or details of products, and purchasing. Footer consists of information on address or business contact information, information to be customer, and payment and product delivery services.

In this section, it has been determined that CMS in front-end is seen in customer service systems, products, and news or article. While in back-end section, CMS is seen in login system and database administration. Meanwhile, On-page SEO can be determined from keywords in title tag, and heading, description or caption. Off-page SEO can be determined from the content of news or articles, website content, social media or social networking, and information or special mark included in the web (bookmarking).

2.3. Implementation

The implementation is performed by empowering hardware and software by means of installation and coding or programming with appropriate software that has been prepared. Implementation is performed using local application system model including the test model before on-line implementation i.e by uploading the domain on Internet. The preparation of localhost implementation is firstly by installing system requirements by meeting the specifications of hardware and software installations. Software installation that needs to be prepared is XAMPP containing application package of PHP program, MySQL Database and webserver, Browser such as Mozilla Firefox, WordPress, and Notepad for coding and database definitions positions as shown below.

```
// ** MySQL settings – You can get this info from your web host ** //
/** The name of the database for WordPress */
define('DB_NAME', 'wordpress');
/** MySQL database username */
define('DB_USER', 'root');
/** MySQL database password */
define('DB_PASSWORD', '');
/** MySQL hostname */
define('DB_HOST', 'localhost');
```

When coding has been completely changed, save the file as wp-config.php.

1. After changing, continue installation process by typing http: // localhost / wordpress / at t URL and enter.
2. Then fill in Blog Title column and Your E-mail, click Install WordPress. After that, **a username and password** will be generated by system.

3. Log in and enter username and password obtained previously on the page until local WordPress Blog Dashboard appears. You have succeeded to install wordpress on computer and can start a web-making activity off-line.

After preparing supporting software installation, implement the application needs. Requirements of cyber cluster application in e-commerce being developed are:

1. Creation of SME domain in accordance with cluster, i.e www.batik-kendal.com, www.handicraftkendal.com, www.taskoperkendal.com, www.pariwisatakendal.com, and www.umkmkendal.com. The selection of the right domain name is an important basis for any e-commerce business.
2. The use of hosting to store data needed by a website that can be accessed via Internet. Hosting is used in the creation of e-commerce web with capacity of 150MB and bandwidth transfer of 1.500MB per month.
3. The use of CPanel. Batik Kendal Cpanel account can be accessed by typing the domain name in browser followed with **/Cpanel** or **:2082.** For example: **batik-kendal.com/cpanel** or **batik-kendal.com:2082, as well as /CPanel applied to other domain names.**

The next step is implementing the website content. When creating a website, it is required to write the name or web address in URL field of a browser as shown in Figure 2 below:
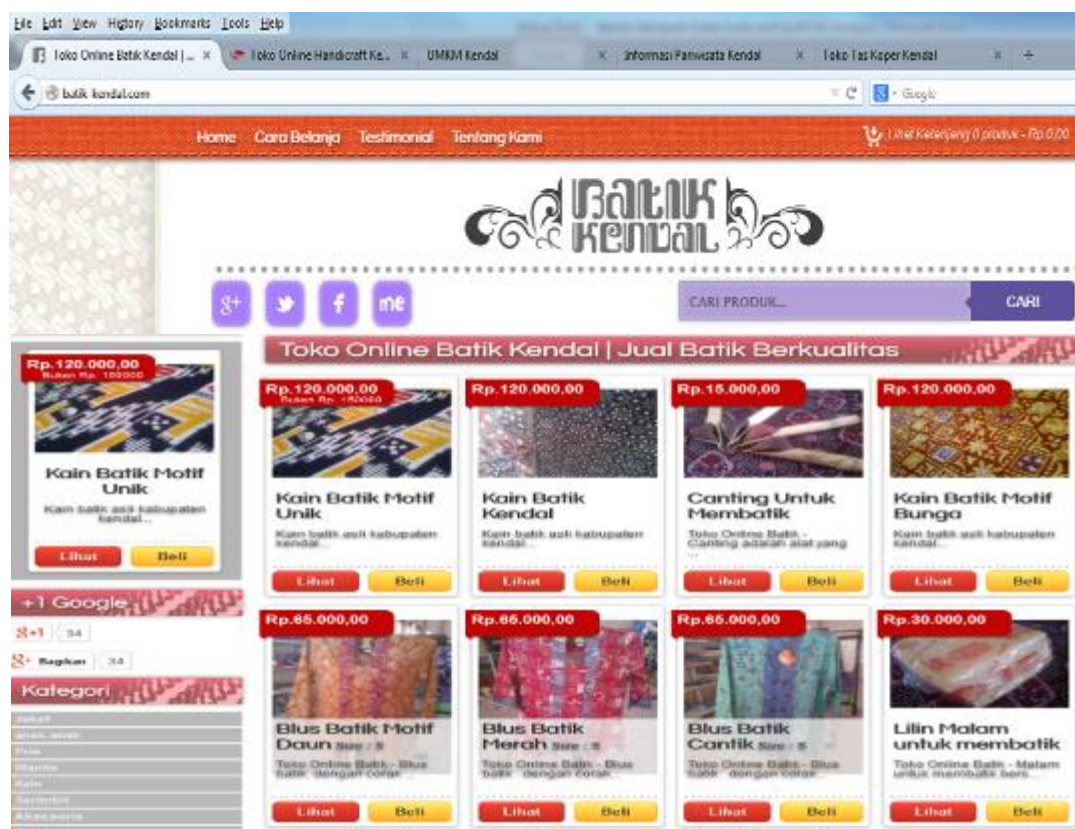

Figure 2 Example of HomePage Display

On the display, there are several menus i.e Home, *Cara belanja*, Login and *keranjang belanja*. This application display certainly matches with the design of interface (UI) that had been developed before. In login page used by user to log into customer menu, if users are logged in, they are able to make order, to edit customer data, and to provide testimonials. For login, user is required to enter email address, password, and captcha code that have been given such as in Figure 3 below.

Figure 3 Customers User Login Page

In addition to display of other pages, *keranjang belanja* facilitates customer to see what items to be ordered. In this page, customers can also change the number of goods being ordered by changing the number of order. The screenshot display can be seen in Figure 4 in *keranjang belanja* page.

Figure 4 *Keranjang Belanja* Page

III. RESULTS AND DISCUSSION

3.1. Application of SEO Sitemap

After optimizing website that was created, SEO is then applied by creating a XML-based sitemap to provide information on all pages and contents in the web to Google search engine, in this case is Google Webmaster Tools. Screenshot display of batik-kendal.com XML is as shown in Figure 5 below.

Figure 5. Display of Sitemap Menu in Google Webmaster Tools.

3.2. Application of SEO
  a.　Implementation of Meta *Description* and *Keywords*

In order to get ranked in the search engines, the formulation of this Meta tag should be considered which can be made as the display of Figure 6 below.

Figure 6 Display of Meta Tag Description and Keywords

  b.　Tag Title

Title Tag is generally placed right under tag "<head>". Figure 7 below is the display of Title Tag screen shoot that contains targeted keywords like this one.

Figure 7 Tag Title Display

  c.　Backlink

Website optimization process is carried out with a variety of anchor text and title attributes, as already implemented in e-commerce website using anchor text and title "*Jual Batik Berkualitas*" as seen in Figure 8 below.

Figure 8 Link Display Directing to Batik-kendal.com.

3.3. SEO Test

  a.　Test with Awstats

Awstats aims to identify the statistical analysis of web http://batik-kendal.com, the number of visitors of the website. Admin will easily know how popular a website he has. By utilizing Awstats, admin or the owner of website will get some reports such as: Unique Visitors, Number of Visits, Pages, Hits and Bandwidth, as well as several other reports such as visiting country, keywords being used, operating systems, browsers and search engines such as in Figure 9 below.
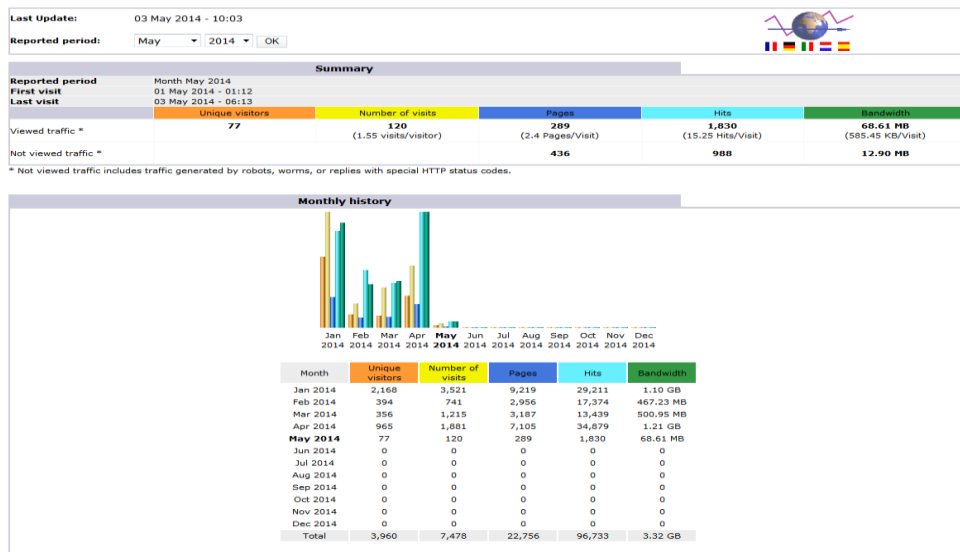
Figure 9 Example of the statistical result of web traffic for batik-kendal.com

b. Test in Search Engines

Testing process is conducted to optimize website in the Google search website by using some keywords. It is as shown in Figure 10 below.
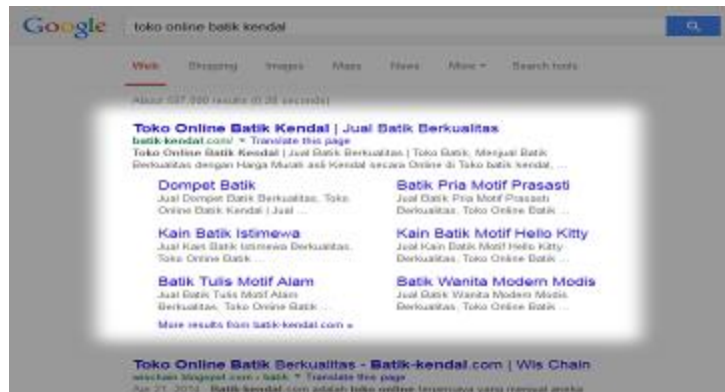

Figure 10 Search By Keyword 'Toko Online Batik Kendal'

c. Test with Alexa Rank

This is used to analyze the traffic or page views of a website based on the number of visitors and to identify the number of backlink obtained, then the data will be collected and ranked based on the traffic. The result of alexa ranking from website http://batik-kendal.com : can be seen in figure 11 below.
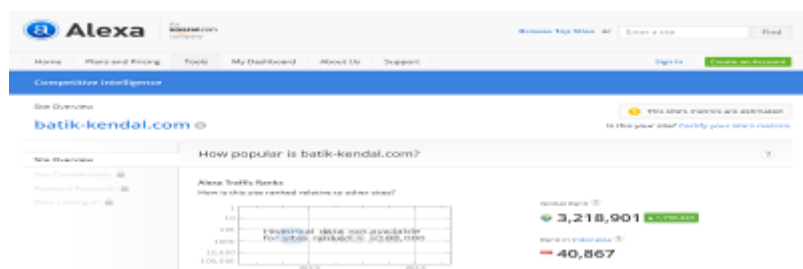

Figure 11 Ranking of batik-kendal.com in Alexa

d. Chkme

Is a tool used to measure to which extent the power of SEO on a website. The result of SEO level check results from the website http://batik-kendal.com: can be seen in figure 12 below.

Figure 12 Chkme Result

IV. CONCLUSION

In this study, the study on the development of E-Commerce model with CMS- and SEO-based Cyber Cluster techniques has been conducted. With the application of On-page SEO and Off-Page method and CMS to some SME website group, some conclusions are generated as follows:

a. Implementation of cyber cluster-based SME E-Commerce with sufficient features is able to implement CMS- and SEO-based e-commerce

b. SEO implementation is conducted by making sitemap in the form of webmaster tools, application of meta description and keywords, title tags and backlink.

c. SEO test is conducted using Awstats and it generates web statistical analysis, test on search engine generates web rankings on search engines, d alexa rank and chkme produce the ranking of the created web.

V. SUGGESTION

Suggestions of this study are:

a. Update process and SEO empowerment is required on On-page and Off-page scale to increase ranking in search engines.

b. A sufficient period of time is required to see the development and improvement of ranking by always updating SEO facilities and features.

c. A development team of SME website should be established in each cluster so that the website content becomes more complete and the ranking in search engine is always improved.

VI. ACKNOWLEDGEMENT

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