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***Abstract*—Email marketing is broadcasting commercial messages to a group of people using email. Currently, email marketing is consistently delivering relatively high return on investment (ROI) in a marketing field. However, collecting subscriber information and sending the email only to interested consumers is a major research issue in email marketing. This paper introduces a conceptual model for an effective email marketing system clustering and segmenting subscribers based on their activity throughout a marketing campaign. The model consists of two main components: Collecting subscriber activity data and Clustering and Segmenting subscribers. We performed a marketing experiment based on our model and analyzed subscriber activity data. Using our model, the overall performance of subscriber activity was improved after sending out email campaigns to segmented groups of subscribers based on their individual interest.**

Keywords—Email Marketing, Subscriber Analysis, K-means Clustering

I. INTRODUCTION

In recent years, market research has shown that email marketing is still a more trusted medium for marketers than traditional digital marketing. According to the market research firm The Radicati Group - there are over 2.5 billion email users worldwide and this figure is expected to grow to over 2.8 billion by year-end 2018 and worldwide revenues for the Email Market will be $12 billion in 2014, and grow to over $23.5billion by year-end 2018. [1]. Email marketing is directly marketing a commercial message to a group of people using electronic mail (email) to send ads, solicit sales or donations, request business, or, build loyalty, trust or brand awareness among potential customers. [2] Email marketing has four major advantages: 1) It can be lower in cost than other types of marketing. 2) Because email takes less time to create and send, marketers can communicate with subscribers more frequently. 3) Marketers can test their email marketing campaign to know what graphics, headlines, offers and even colors subscribers will respond to. 4) Forwarding an email with an enticing or useful offer or piece of information only takes seconds and many users will do it. That means marketing effort has not only a wider reach but also a networked reach with people who, by forwarding email, are now acting as marketers brand advocates. [3] [4] [5] Research shows that for every dollar invested in Email Marketing, marketers may get as high as return of $43.52. [6] [7] According to Email Marketing Industry Census 2014, two-thirds of marketers (66%) state that email delivers an 'excellent' or 'good' ROI, with 8% of businesses achieving more than half of their sales through this channel. [8]

Even though present technology allows email marketers to send bulk email and track goal conversion data, sometimes generic segmentation can lead to an irrelevant email campaign and in a worst case a sender's email might be marked as spam. Because of the CAN-SPAM Act [9], spamming can lead to penalties of up to $16,000 in the U.S. It allows spammers to be imprisoned and it outlaws many of the tactics spammers use to hide their tracks and avoid censure. Lack of data about subscribers' activities often leads to unsuccessful marketing campaign or decrease of ROI. To avoid such problems, email marketers need to launch campaigns for targeted audience based on their interest and relevancy.

This study focuses on a new conceptual model for effective email marketing, which includes subscriber acquisition and source profiling, collecting subscriber activity data, and clustering subscribers based on Modified K-means Clustering technique [10]. According to our experimental result, we were able to gain higher ROI than with a non- segmented email marketing campaign.

The format of the remaining portions of this paper as follows: Section II introduces some related researches and case studies in email marketing. Section III illustrates an outline of Conceptual Model of Effective Email Marketing with description of the components. Section IV explains a concise experimental evaluation. Finally, section V gives the conclusion statement and discusses the direction of future research.

II. LITERATURE REVIEW AND MOTIVATION

Email marketing has received the attention of numerous marketing researchers, authors, and companies in the past fifteen years. Marketing strategies and technology have significantly improved to deliver the best value to subscribers. Various techniques and experiments have been conducted to improve subscriber experience and increase revenue. Email marketing software is built and optimized to send bulk emails to subscribers and at the same time make important data available to marketers. Marketers can now easily track and

optimize their campaign based on subscribers' activity histories. This section reviews the background and present research on Email Marketing.

In 1978, Gary Thuerk, a marketing manager at DEC, sent the first commercial email mailing to 400 users via Arpanet [11]. Even though Gary is now known as the "Father of Spam," he sold $13 million worth of DEC machines as a result of the mailing.

The first Smartphone was introduced in 1992, which enabled a mobile device to receive and send emails [12]. Email marketing history was changed radically. Rettie, Ruth [13]analyzed 30 email marketing campaigns to identify factors associated with higher response rates. They found the following factors were associated with increased response rate: subject line, email length, incentive numbers of images. For nine of these campaigns they were able to link demographic and lifestyle data to response. Analysis of these campaigns suggests that recipients who have previously bought on the Internet have higher response rates to email marketing. These finding are used to create an email marketing process model based on the Vriens et al (1998) [14]direct mail process model.

Phelps, Joseph E., et al. [15] discussed the motivations, attitudes, and behaviors of those who pass along email messages. Only by understanding these motivations and behaviors can advertisers hope to tap effectively into this rich vein of communication and advocacy. Their research provided a useful starting point and impetus for further research examining pass-along email and other computer-mediated consumer-to-consumer interaction.

In 2012, Direct Marketing Association reported that 72% of marketers felt that email was great for developing loyal and active customers. The proportion of email opened on mobile devices reached 41% in the second half of 2012 and the number has continued to grow [16].

Email marketing software has been introduced to assist marketers in launching a marketing campaign via email. Some of the most popular Email Marketing software are Aweber, MailChimp, Getresponse, Sendy, and Infusionsoft [17].

Although numerous analytic services such as Google Analytic [18] allows a marketer analyst to track visitors' activities on a web page, associating those activities data with subscribers' email is helpful to get insight about subscribers' interests about products. Analyzing a subscriber's activity flow within a webpage and combining the data with the product, campaign data will leverage information about potential marketing opportunities. We also emphasize on subscribers' interest on marketing campaigns and products based on their activities history. Our goal is to increase subscriber experience upon receiving relevant product offers in their inbox. Relevancy in Email Marketing will help marketers to get a higher ROI and be more productive in marketing campaign. Our proposed model focuses on clustering and segmenting method of email subscribers according to their interest. In order to motivate the presentation of proposed method, the following sections will explore the complete scenario of our proposed model.

III. PROPOSED MODEL FOR EFFECTIVE EMAIL MARKETING

We divide our model into two scalable components. The first component is *Collecting subscribers' activities data*. This component is divided into 8 sub-components: Subscriber Acquisition, General Subscribers, Campaign, Subscribers' Activities, Web Interaction, Goal Achievements, Purchase Log, and Fact Constellation Schema & OLAP Cube. [19] The second component is subscriber segmentation. For this we first collect subscribers' activities data, campaign data, and product data. Then we analyze these complex sets of data to build our clusters of likeminded subscribers.

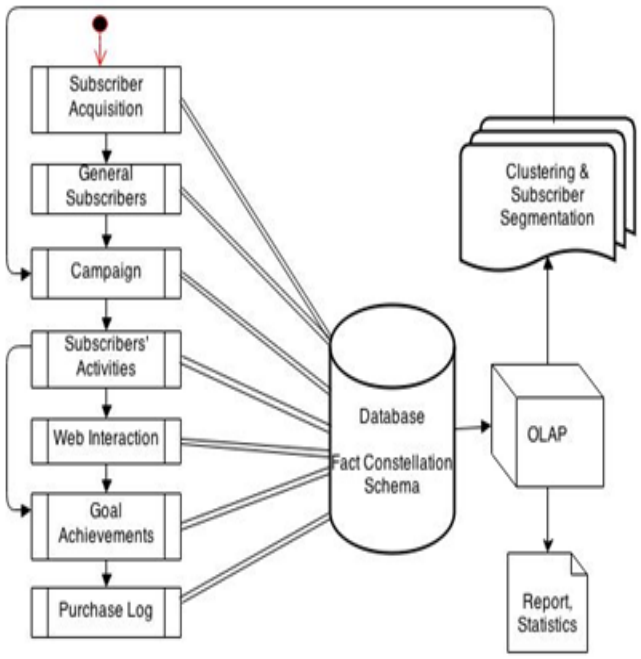

Figure 1. Conceptual Model for Effective Email Marketing

A. *Subscriber Acquisition*

Subscriber acquisition is the primary step of Email Marketing. Acquisition sources can be a survey, various product offers, promotional advertisement, etc. While acquiring the subscriber email, sources can be added into each individual email. For example, (xyz@mail.com, new_year_offer). Here the "new_year_offer" is value for sources. This source value could be a campaign name, mostly depend on the. The reason behind this value added to each email is to determine the quality of the campaign for acquiring subscriber. Here are the few subscriber acquisition sources:

Visitors to websites: Marketers often uses an email sign-up box for their website that allows users to join their mailing list.

Customers who purchases goods or services: Customers who do make a purchase or transaction are even more valuable

email marketing leads because they've shown a willingness to purchase from the site or entrust the seller with personal or financial information.

Search engine (Organic or Paid): Advertising through search engine. A special tracking variable can profile each source.

Offline locations: Email acquisition can also be done by offline sources. For example in retail location, marketers can collect emails when customers purchase or visit the store or other location. However marketers need so specify the meaningful source value for their campaign.

B. General Subscribers

Before segmentation every subscriber is marked as a general subscriber. Basic data about each general subscriber is recorded into database. This raw data will be used for further segmentation.

C. Campaign

The data about a marketing campaign is recorded onto the database. The values are generally campaign name, campaign type, time, budget, etc..

D. Subscribers' Activities

The data about a marketing campaign is recorded onto the database. The values are generally campaign name, campaign type, time, budget, etc.

Segmenting subscribers into similar groups is necessary to launch a successful marketing campaign. We are emphasizing subscriber activity to gain more knowledge about the flow of interaction of a visitor throughout the marketing funnel. Instead of generic profiling through surveys like segmentation, we concentrate more on natural interaction of a subscriber. For example, if we do a survey-based segmentation that requires a completed form to get a personalized marketing offer or products recommendation, it will take time for the subscriber to complete the survey. If the subscriber does not have the time or interest to fill out a survey form, there will be some blank areas for sub-categories. Also this process will not provide a profitable experience for the visitors or subscribers. For instance, not all chefs are fond of cooking with wines, and some chefs may not use ginger as much as Asian-influenced chefs do. Similarly, the category readers may be further divided into subcategories or different genres. Email Marketing needs to be as accurate as possible, because if marketers send uninteresting email offers to subscribers, there will be no readers. In a worst case scenario, emails will be moved into the spam folder or unsubscribed.

Thus, to solve the problem of segmenting customers, we track subscriber activity. In order to segment into similar groups, we look for the following key elements:

I. Open rate: Open rate is a measure of how many people on an email list open (or view) a particular email campaign. The open rate is normally expressed as a percentage, and we calculate it as follows: A 20% open rate would mean that of every 10 emails delivered to the inbox, 2 were actually opened. A high percentage of open rate increases the chance of a successful marketing campaign.

II. Click rate: Email click-through rate, is expressed in percentage, and calculated by dividing the number of click throughs by the number of tracked messages opened.

E. Web Interaction

Using Javascript, DOM, Ajax, we track subscribers who click on various product links on a website. We also track product impression on a web page. These clicks and impressions are determined as a factor to cluster similar subscribers. For example, if a subscriber visits a page which has multiple products, an impression point is recorded against the subscriber for the products that subscriber showed an interest. Access to a recipients' web interaction data can help marketers gain an in-depth understanding of how the customer is browsing a website. Abandoned shopping carts and completed applications, for instance, will show what the consumer is in the market for. Thus filling the blanks for what kinds of email campaigns will prove most compelling

Segmentation criteria can be used to target specific types of subscribers. Suppose we want to launch an email marketing campaign for Asian cooking products, the segmented subscribers will meet the following criteria ; which have high email activity rate, has meet certain goals in past (browsed the advertisement or promo), has purchased Asian cooking products (like ginger, onion, shallots), and has interest in Asian culinary or related products.

F. Goal Achievement

The goal rate is expressed in percentage, and we calculate it as follows: Perhaps 10 emails are sent to a subscriber and each broadcast/campaign has a specific goal value. If the subscriber reaches 3 goals then the goal percentage is 30%. Goals can be visiting a specific url/web page or completion of a purchase. If there are multiple goals for each broadcast or campaign, the overall rate can be weighted.

G. Purchase Log

Before segmentation every subscriber is marked as a general subscriber. Basic data about each general subscriber is recorded into database. This raw data are used for further segmentation Purchase logs are an important metrics for determining the rating of subscribers. The subscribers who have already spent money on products are likely buy more in the future. Purchase history can be a valuable predictor of a consumer's next move. By looking at what the subscriber has purchased in the past and what they are using now, email campaigns can be customized to suggest a personalized next step. For example, if the customer just bought a new mobile phone, sending emails about specific specials for phone cases and screen protectors can help direct the next purchase. Purchase logs can be divided into different sectors such as: Product type, Product price, Date & time of purchase, Product refund rate.

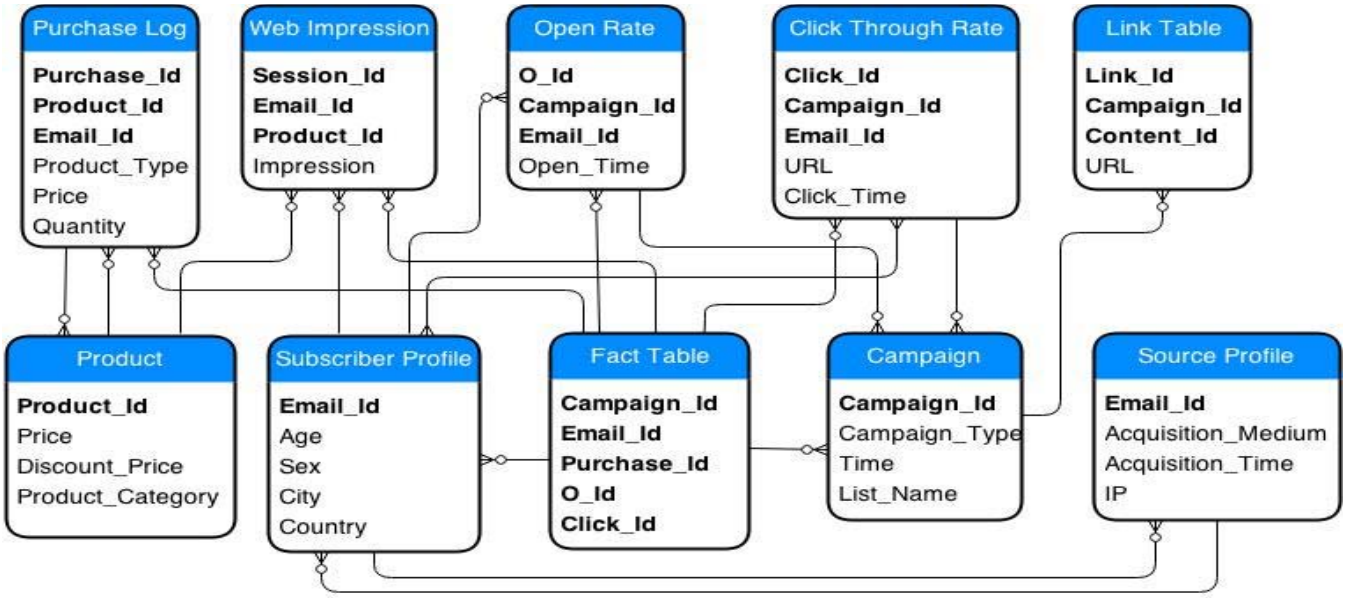

Figure 2. Sample Database Schema

H. Fact Constellation Schema & OLAP Cube

Because of analyzing the large volume of subscriber history data, we consider Online Analytical Processing (OLAP) for analyzing, segmenting and predicting sales process.

We consider using snowflake schema as we are tracking a variety of actions of each subscriber. The reasons behind choosing this schema are: a) easier to maintain change b) dimension table is relatively in size and it reduces space. This schema also provides the flexibility to add new tables and attributes without compromising current structure of the database. For example; if we want to count total time of user spend on the website or on a specific page we can add data in a separate table. A sample of the database schema is shown in figure 1.

In this schema various modifications can be implemented. The number of fields can be increased based on modification of a component. It is important to be careful to minimize the redundancy of the database schema.

I. Clustering and subscriber segmentation

Once we have completed the first component of the model, collecting subscriber data, we begin the second part, clustering and segmenting this data. Various methods can be used to analyze the data. We will focus on one of them in order to segment and cluster subscribers. Clustering subscribers is useful because we are looking for a group of similar people with different dimensional values. We are not looking to segment subscribers by their gender, location or response rate but by the similarity of their activities throughout marketing campaigns. For example, we are not looking to segment subscriber list consisting only buyers but also subscribers who has shown interest on the products.

J. Clustering Algorithm (MKC)

To segment subscribers based on interest and activities, we used Modified K Means Clustering Algorithm.[10] We consider subscribers' Open Rate (or), Click through Rate (ctr), Purchase Rating (pr), Impression on products (ip) for clustering subscribers. Purchase Rating is a rating based on subscribers' purchase history. For example, if a subscriber purchases one product after receiving 5 emails about the product, the rating will be 20% for that specific product. Impression on products (ip) is a rating based on weighted calculation of each product for each subscriber. For example if a web page containing four products is visited by a subscriber, then the subscriber will have impression records on each product. For the algorithm, the selection of subscribers is based on product campaign and impression. For instance, we can select the set of subscribers who have received a particular product campaign ad via email or have impression records on a database.

K. Report, Statistics, and Prediction

Analyzing the whole market process and ROI depends on the entire process of the system. The analysis starts with the Subscriber acquisition (reference III.A). Profiling the initial process with important data like total advertisement cost, acquisition channel/medium will give insights to marketers about marketing campaign. For example, if a certain channel/medium gain subscribers more than other channels/mediums, marketers can focus on building their campaign based on that channel/medium. Profiling acquisition channel/medium will also help marketers to know about their subscribers' activity habit. Marketers can also compare different campaigns. Because of detailed segmentation and profiling, marketers can also gain information about the forecast of future sales in a different niche. For example, a sales log database will have data about the purchase history of

a product, time of purchase, frequency of purchases, number of sales, etc.

L. Research Design

To conduct the research we approached an internet marketer, who has been doing internet marketing for five years, to volunteer in our research. The person has a list of several thousand emails of subscribers. We had access to the person's marketing website and only specific databases for our research purpose. We have created our own database according to the snowflake schema. We also added custom JavaScript and PHP scripts on the pages of the website. The scripts were inserted to track the customer activity throughout a visiting session. The person also sent email campaigns with our own custom tracking script to track the number of emails opened. We created custom link with subscriber's email at the end of the URL to track a session. For example consider the link: www.example.com/?e=XYZ@gmail.com&session=name&campaign=promo. Here the link has variable of e which contains a subscriber's email. When the subscriber clicks on the link the website load with the subscriber's email and a cookie is created containing the subscriber's email. Then the email cookie [20] is used to track activities throughout a session. For example when a user click on a links to or visits a page then the tracker script triggers an action and stores the event action in the database along with the email. Sample database syntax:

INSERT INTO web_impression (session_id, email_id, product_id, impression) VALUES ('XZV', 'XYZ@gmail.com', '1').

IV. EXPERIMENTAL RESULT

To test the effectiveness of our proposed model, we have conducted a marketing experiment. We have taken an email list of 417 subscribers who are generally interested in "online marketing" niche. This niche has different other sub-categories, such as building a responsive list, generating high web traffic, affiliate promotion, etc. After sending 27 promotional emails to the subscribers for different sub-category courses, we were able to gather data about subscriber activity. Then we analyzed the data and made clusters of subscribers based on their interest and activity history. We sent a personalized email campaign to our clustered subscribers afterwards.

Figure 3 shows the overall open rate and click through of total subscribers of January 2014 to July 2014. We collected data of subscriber activity from January to March. These data consists of number of emails opened by subscribers, individual subscriber's activities throughout a marketing campaign, clicking links of promotional offer, visiting specific web pages etc. Then we created clusters of similar subscribers based on their activity data. In order to create clusters first we ran database queries of subscribers associated with products that we want to send promotions for. Then we ran the algorithm based on subscribers' four activity attributes (Open Rate (or), Click through Rate (ctr), Purchase Rating (pr), and Impression on products (ip)). After processing the list of subscribers we got three clusters of subscribers. We started to send personalized email to the very subscribers from April to July. The overall open rate (Averages of Percentages of email

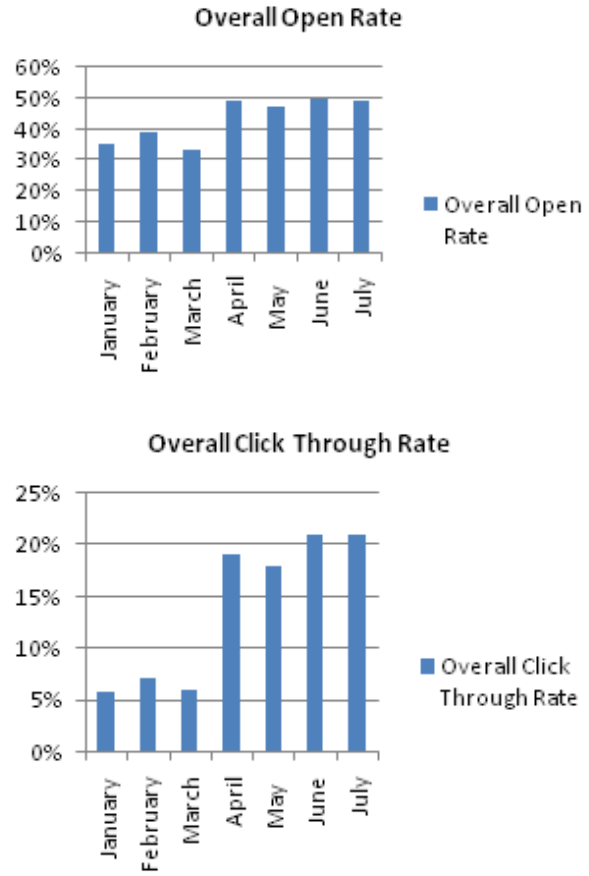

Figure 3. Overall Open Rate and Click through Rate

opened by subscribers) had started to improve from April. The highest overall open rate (50%) was recorded in June. At the same time overall click-through rate was also improved.

Figure 4 shows the number of products sold in between January to July. The trend of sold products helped us to track the performance of our model. Also in June we had highest ROI of 77.8%, which is very significant.

At the end of our experiment, the overall percentage of activities such as open rate and click rate (reference III.D) were increased as much as 10%. We compared the ROI of the campaigns before and after using our model. Relevant clustering helped us to personalize the campaign contents and funnel, and we were able to increase ROI as high as 43%.

V. CONCLUSION

Our research proposes an efficient and scalable model for effective Email Marketing. Tracking subscriber web interaction data and email activity helped us to get more insight into prospective subscribers. Considering a variety of aspects and narrowing down the huge set of important data into a few clustering factors rendered the segmentation more efficient.

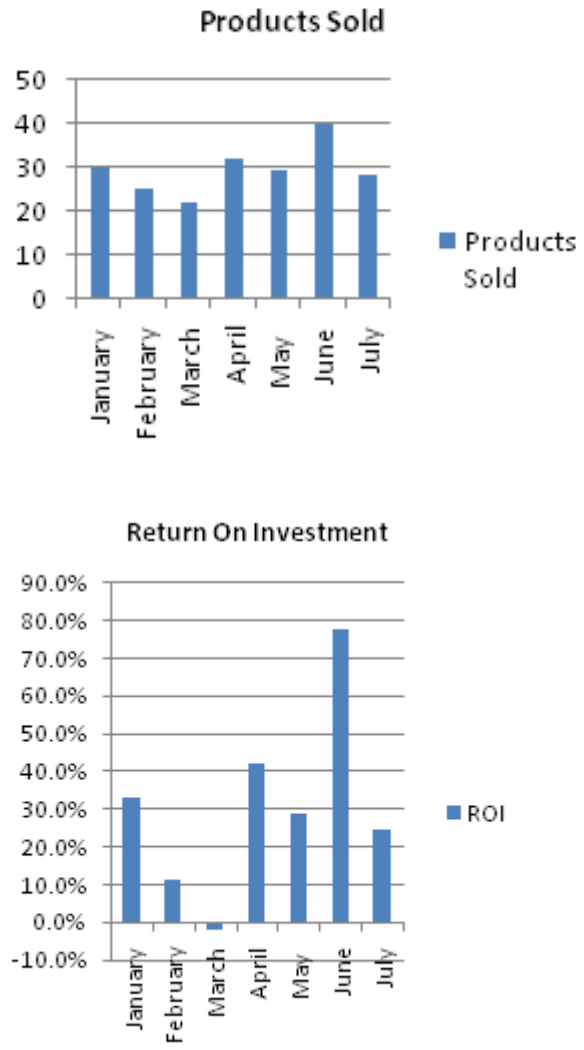

Figure 4. Products Sold and ROI of January to July

This model is also scalable to need and market requirements. Modifying a sub-component like Web Interaction may help marketers to gain more insight about subscribers. For example, a certain page can contain discount products. If the overall impression ratings of discounted products are higher than regular-priced products, then we can assume that subscribers are more interested in discounted products. Also testing various contents and structures of a page may increase or decrease the amount of overall subscriber activity and ROI. All these factors can be integrated onto the system and database. Using the Modified K Means Clustering Algorithm also increased the efficiency of segmentation. Moreover the availability of huge set of data empowers the overall marketing performance. We were able to test our email campaign according to the relevancy of our subscribers' interest and we were able to achieve higher ROI in test run. In future, we will extend our clustering approach, considering not only open rate, click through rate, impression on products or purchase history, but also the pattern of activities in the marketing funnel. We will also consider the facts of activity patterns such as seasonal data log, and product type.

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REFERENCES

[1] Radicati Team, 'The Radicati Group, Inc. Email Market, 2014-2018', Radicati.com, 2014. [Online]. Available: http://www.radicati.com/?p=12482. [Accessed: 24- Nov- 2014].

[2] Benchmarkemail.com, 'What Is Email Marketing? - Benchmark Email', 2014. [Online]. Available: http://www.benchmarkemail.com/resources/email-marketing-articles/what-is-email-marketing. [Accessed: 24- Nov- 2014].

[3] D. Ryan, Understanding digital marketing. [S.l.]: Kogan Page, 2014.

[4] Marketingsherpa.com, 'New Survey Data: Email's ROI Makes Tactic Key for Marketers in 2009'. [Online]. Available: http://www.marketingsherpa.com/article/emails-roi-makes-tactic-key. [Accessed: 24- Nov- 2014].

[5] Emailmarketing.comm100.com, 'The Top10 Benefits of Email Marketing', 2014. [Online]. Available: http://emailmarketing.comm100.com/email-marketing-ebook/email-marketing-benefits.aspx. [Accessed: 25- Nov- 2014].

[6] S. Jenkins, *The truth about email marketing*. Upper Saddle River, N.J.: FT Press, 2009.

[7] GetResponse, 'Email Marketing Secrets Guide', 2008. [Online]. Available: http://www.getresponse.com/documents/core/white-papers/Email_Marketing_Secrets_Guide.pdf. [Accessed: 24- Nov- 2014].

[8] Adestra, '2014 Email Marketing Census - email is number 1 for ROI', 2014. [Online]. Available: http://www.adestra.com/resources/downloadable-reports/2014-email-marketing-industry-census/. [Accessed: 25- Nov- 2014].

[9] Business.ftc.gov, 'CAN-SPAM Act: A Compliance Guide for Business | BCP Business Center', 2014. [Online]. Available: http://www.business.ftc.gov/documents/bus61-can-spam-act-compliance-guide-business. [Accessed: 25- Nov- 2014].

[10] R. P. D. Nath, H. Lee, N. K. Chowdhury, and J. Chang, "Modified K-means clustering for travel time prediction based on historical traffic data." in *Knowledge-Based and Intelligent Information and Engineering Systems*, Springer Berlin Heidelberg, 2010, pp. 511-521.

[11] S. Hedley. "A brief history of spam." *Information & Communications Technology Law* 15, no. 3, 2006, pp. 223-238.

[12] I. Sager. "Before IPhone and Android came Simon, the first smartphone." *Bloomberg Businessweek*. Bloomberg LP ISSN, 2012.

[13] R. Rettie. "Email marketing: success factors.", 2002.

[14] M. Vriens, H. van der Scheer, J. Hoekstra and J. Roelf Bult, 'Conjoint experiments for direct mail response optimization', *European Journal of Marketing*, vol. 32, no. 34, pp. 323-339, 1998.

[15] J. E. Phelps, L. Regina, M. Lynne, D. Perry, and N. Raman. "Viral marketing or electronic word-of-mouth advertising: Examining consumer responses and motivations to pass along email." *Journal of advertising research* 44, no. 04, 2004, pp. 333-348.

[16] Econsultancy, '41% of email is now opened on mobile devices', 2014. [Online]. Available: https://econsultancy.com/blog/62268-41-of-email-is-now-opened-on-mobile-devices. [Accessed: 25- Nov- 2014].

[17] M. Taylor, 'Email Marketing Software & Services - Which One's Best?', Venture Harbour, 2014. [Online]. Available: http://www.ventureharbour.com/email-marketing-software-tools-one-best/. [Accessed: 25- Nov- 2014].

[18] Google Developers, 'Tracking Site Activity', 2014. [Online]. Available: https://developers.google.com/analytics/devguides/collection/gajs/asyncTracking. [Accessed: 25- Nov- 2014].

[19] Han, Jiawei, and M. Kamber. Data Mining, Southeast Asia Edition: Concepts and Techniques. Morgan kaufmann, 2013.

[20] Allaboutcookies.org, 'All About Computer Cookies - Session Cookies, Persistent Cookies,How to Enable/Disable/Manage Cookies', 2014. [Online]. Available: http://www.allaboutcookies.org/. [Accessed: 25- Nov- 2014].