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Development Of The Customer Assessment Method: WEB-Page Performance Quality

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Abstract
The article outlines the method of determining the final value assigned by different users and customers to the performance quality of the Web page engaging in advertising and marketing activities. For this purpose, the database structure of customers (Customer Data Base (CDB)) addressing the Web page and evaluating its performance by various means has been developed.

Some sources to be used by customers have been analyzed to assess the activity of the Web page. The methods have been provided to formulate numerical value from the linguistic values given in the text-based sources and customer activity. Customer value matrix (CVM)was formed based on the values given by different customers. Finally, customer values for Web page were assigned by using weight ratios of various sources and customers.

Keywords: Customer activity, customers database, customer value vector, customer value matrix, attitude alphabet, natural separators, customer value.

1. Introduction

It is known that the core of e-commerce is the electronic form of trade. Electronic commerce is known as electronic business. The Financial business in e-commerce is implemented via e-form over the computer network - the Internet and among the business partners. As a result, by saving time with the help of a computer network based on the exchange of goods or services participants can purchase, or sell. [1].

Recently, e-commerce development is characterized by the development of CRM technologies and by the rapid growth of the application of these technologies in the activities of different enterprises. [2]. One of the most important goals of more than 60% of all projects implemented around the world is CRM. The breakthrough of the technology has led to the expansion of trade areas and the development of information

support for the work with customers. However, research shows that despite the fact that firms applying CRM systems have emphasized the significance of these systems, the number of firms and companies operating in the old working style reaches 50% [3-5].

Various requirements are developed for CRM systems to capture the pulse of life and improve business with customers. The requirements for learning the most diverse aspects of customers are being placed. The corresponding correction is carried out in the system to consider these requirements[6].

Studying and taking into account of this or similar customer information ensures the success of CRM systems.

2. Problem Statement. It is known that one of the most important aspects of electronic commerce is related to the organization of advertising and marketing activities on the Web page [7]. In many cases, the results of Web pages' activities are evaluated by the help of the measure of the volume of traffic. The presence of traffic results in the sale of offers of people who places announcements. One of the ways to increase the efficiency of web pages is to generate a customer's value for the page and improve the performance of the page on this basis. Analyzing customers' values for the Web site's activities will, in relevant cases, improve the business strategy [8].

Rules have been proposed to improve customer services, and customers are precious more than anything else [9].

A generalized value from the value that is generated from individual customers on the page should be formulated to improve Web page's performance.

In the article, one of the methods of forming this value was set and resolved.

3. The method of formulation of the generalized customer value.

First of all, the Customer Database (CDB) should be established to address this issue. Information about the customers who visit the Web page within a specified time (for example, in the last year) should be collected in this database. The minimum required content for the information to be obtained in the database can be as follows:

- Customer’s Name (The system can then identify the customer's surname and patronymic);
- Customer’s Age;
- Customer’s Gender;
- Customer’s Occupation;
- Customer’s purpose for visiting the Web page;
- Customer’s linguistic value assessment for the page in the form of the comment;
- Customer’s numerical value for the page, etc.;
- Secret details. Customer’s value given by web page (customer’s weight). Customer's weight is set to 0-1, and 0.5 is set to the first customer;

- Secret details. Customers referral frequency to the page.etc.

If we consider the customer's webpage value as a value vector, we can mark it as a CVV (Customer value vector). This vector can be written as:

$$CPV=(p_1, p_2,..., p_N) \qquad (1)$$

Here p_i -s are the components retrieved from different sources of value vector. Customer value matrix (CVM)results from the values given by M different customers.

This vector

$$CPM = \begin{pmatrix} p_{11}, p_{12},..., p_{1N} \\ ... \\ p_{M1}, p_{M2},... p_{MN} \end{pmatrix} \qquad (2)$$

In this matrix, each row refers to a customer, and the number of rows is equal to the number of the customers visiting the web page for different purposes. But the number of columns is the number of sources of customer values. Let us note some of them:

1) The numerical value is given by the customer on the page;
2) The value generated from the comments of the customer on the page. For this purpose, to provide an option to customers to comment on page and customers should be encouraged to write these comments. The problem of translating attitude (satisfaction, negative attitude, etc.) into the numerical value can be solved. A simple algorithm developed for the content analysis in this article.
3) The value generated from SMS based data from customers;
4) The value generated from email-based data from customers;
5) Values made as a result of periodic surveys created by Web Page itself. The Web page should conduct regular questionnaires to assess its work, give the individual time to collect the answers to those questionnaires and use the retrieved results for evaluating web page performance quality.
6) The value generated from the customer referral frequency to the web page. Etc.

Among these sources, the numerical value written by the customer on the page can be used directly. However, these texts should be analyzed because values to be derived from other sources are textual, and the value given by users and customers for the web page performance should be generated. There are methods and algorithms available in the literature to solve similar issues using numerous words and phrases [10-12]. However, it is necessary to give a simple algorithm to form the value, taking into account the specific features of the problem stated in this article. An example of such an algorithm is given below. It should be noted that customers' comments on the web page, text messages sent in the form of SMS or answers to the surveys through the text are smaller in size. Therefore, these texts can be stored in memory and processed with different algorithms. However, here we propose an algorithm that can be quickly performed.

First of all, the alphabet should be created to form value. For example, we can create positive attitude alphabet consisting of the words, such as "Excellent," "good" "useful," "helpful," and "satisfactory" with weight vectors (p_1, p_2...). To create negative attitude alphabet, we can use the words such as "harmful," "useless," "unhelpful," "bad," "very bad" with the inner weight vector (m1,m2...). The effectiveness of this alphabet created during experiments can be determined and corrected. In the end, we can get alphabet elements of N_l items and arrays with the weight of N_l as well. As a result of the algorithm in the weight vector the maximum element is +10, the minimum element can be written -10 to get a value in the range [-10, +10]. They can be written jointly in a string and real type accordingly as L and P vectors in N_l size. It is possible to note how many times each alphabet element was found when analyzing the current text, by creating the same assistive integer-type T-array. String type Txt array should be created to store the text that is going to generate the value by separating with natural separators (space, comma, etc.). The size of this array is determined during the process of filling. For example, if _l=10, it can be

P=(10, 8, 6, 4, 2, -2, -4, -6, -8, -10) and

L=("Excellent", "good" and "useful", "helpful", "satisfactory", "harmful", "useless", "unhelpful", "bad", "very bad").

Thus, it is possible to generate the value from text-based source via three algorithm blocks.

First Block: Writing the text separated by natural separators to the Txt array, determining the size of the array and writing it into integer type T_c parameter.

The natural separator (N_s) and the number of its natural elements (N_s_c) should be determined to solve the problem. The N_s array can be developed as follows:

N_s=(‘ ‘, ‘,’, ‘!’, ’?’, ‘.’, ...,10, 13). The codes 10 and 13 here are the codes used to go from line to line and return to the beginning of the line. If the text is written to Txb_block array and its number is set to the block_size parameter, then we can find the solution of the problem with the following algorithm.

- Reset Txt array and T_c parameter;
- $i \in [1, Block\_size]$, compare each *Txt_block(i)* byte to the N_s array. In the absence of compatibility
  $Txt[T\_c+1] = Txt[T\_c+1] + Txt\_block[i]$, otherwise
  T_c=T_c+1.

  The Delphi fragment that performs this algorithm can be written as follows:

```
J:=1;
Txt[j]:=’’;
For i:=1 to block_size do begin
Txt[T_c+1]:= Txt[T_c+1]+Txt_block[i];
                    For l:=1 to N_s_c do begin
```

```
                    If Txt_block[i]= N_s[l] then T_c=T_c+1;
    Txt[j]:='';
                                        End;
                                End;
```

As a result, the text to be analyzed is written separately in the form of words in the Txt array and their number in the T_c parameter.

Second Block: Determination of the number of recurring elements of the alphabet in the text(generation of T array). For this purpose, first, reset the number of arrays.

Thus

$\forall j \in [1, N\_l], T(j) = 0$

Then $\forall j \in [1, N\_l]$ and each $i \in [1, T\_c]$ of the L (j) element is checked if it is in

Txt(i) text element. During the testing if

$L(j) \subset Txt(i)$, the corresponding element of the number array is increased:

$T(j) = T(j) + 1$

Let's look at the performance of this algorithm as a Delphi fragment for visualization

```
For j:=1 to N_l do T[j]:=0;
For j:=1 to N_l do begin
        For i:=1 to T_c do begin
        If pos(L[j],Txt[i])<>0  then T[j]:=T[j]+1;
                        End;
                End;
```

As a result, in the T array, the algorithm's alphabet words' recurring numbers are written in the analyzed text.

Third Block: Generating customer value (m_q).To calculate the m_q parameter, by multiplying each number collected in the number array to the corresponding element of P vector we can find the sum of the given values as

$\sum_{j=1}^{N\_l} T(j) * P(j)$. The sum to be normalized should be divided into the sum of the numbers collected in the array $\sum_{j=1}^{N\_l} T(j)$. So, we get the following formula for customer's value:

$$m\_q = \frac{\sum_{j=1}^{N\_l} T(j) * P(j)}{\sum_{j=1}^{N\_l} T(j)} \qquad (3)$$

That is each alphabet element sums by multiplying to the number of its repetitions in the analyzed text. The obtained sum is divided into the sum of the repetitions. This parameter can get the following values:

$m\_q \in [-10;+10]$

Vector P

If $P = (10,8,6,4,2,-2,-4,-6,-8,-10)$ and the numbers retrieved as a result of the analyzing the text are $T = (1,2,0,3,0,0,2,0,0,0)$, then based on the customer value (3) formula we get.

$$m\_q = \frac{1*10 + 2*8 + 3*4 + 2*(-4)}{1+2+3+2} = 3.75$$

If a customer is the m-th in the list of customers who send the text and if the evaluated source is the n-th, we can find value in the CVM array:

$p_{m,n} = m\_q$.

Users do not obtain unique value among the values given to the web page by customers and users, it is obtained indirectly by finding customers' referral frequencies to the page and its assessment. Since this issue is of particular importance, and it is necessary to focus on it.

The Web page traffic can be estimated as approximate from the customers' referral frequencies to page. To set this off, let's take the following::

If we mark the m-th customer's calculated reference frequency with f_m,

And the average traffic size generated during each referral of customer i with v_m, page's traffic size per unit time will be approximately

$$V = \sum_{i=1}^{M} f_m * v_m \ . \qquad (4)$$

This value can not be obtained one by one apart from the frequency of each customer and user's referral. This price can be formulated together, simultaneously and at the same time for all customers from the frequencies of active users.

Whenever a customer visits the page, referral frequency can be calculated for this customer. Thus,

$\Delta t_m = T_m - T_{m-1}$

Here T_m is the last visiting time, T_{m-1} is the time before the last visit. Therefore, m-th customer's j-th calculated visiting time-frequency will be

$$f_{mj} = \frac{1}{\Delta t_{mj}} . \qquad (5)$$

Note: It should be noted that the last current value from other value sources can be taken as a final value. However, while generating the value from the referral frequencies of customers, the last current value cannot be taken as the final value. Here, it is essential to consider how these frequencies change over time. Such solution prevents the occurrence of random value. For the solution of this problem, it is possible to use autoregressive methods and application of various variants of an average floating value in individual cases [13].

For this purpose, by meeting $m \in [1, M]$ requirement, referral frequencies f_m generating customer value can also be defined by exponential law:

$$f_m^j = \alpha f_{mj} + (1-\alpha) f_m^{j-1}$$

By giving various values to α in $0 < \alpha < 1$, the smallest average quadratic difference giving α can be found. To simplify subsequent calculations, we can accept

$$f_m = f_m^j .$$

Let's assume, in the end, in any form random customers' $m \in [1, M]$ frequencies f_m have been found. Because these values are positive, making simple conversions on them it is possible to form customer values that range $[-10,+10]$ in the referral frequencies.

$$m\_q_m = \frac{f_m}{\max\{f_m\}} * 20 - 10 . \quad (6)$$

Customer value generated with the formula (6) is one of the $p_{m,n}$.

By summarizing the above, it is possible to write a general value given by customers to the web page. If weight vectors of the customers and sources are accordingly

$W = (\omega_1, \omega_2, ..., \omega_N)$

$F = (\varphi_1, \varphi_2, ..., \varphi_M)$, then web page value (site value- SV) will be

$$SP = \sum_{j=1}^{M} \omega_j \sum_{i=1}^{N} \varphi_i p_{ij} \quad (7)$$

4. **Summary:** The article outlines the method of determining the final value assigned by different users and customers using various sources to the work quality of the Web page engaging in advertising marketing activities. Some sources to be used by customers have been studied to assess the performance of the Web page here. We developed an algorithm to form numerical value from the non-numerical values given by the users in the text-based sources for the Web page, Customer Value Matrix (CVM) and the method to formulate Customer Data Base (CDB) to store the information about customers.

Created algorithms and methods can be successfully used by Web pages that want to evaluate customer activity, engaging in online business advertising activities. The evaluation of Customers' attitude toward the Web page can play a decisive role in improving business performance.

References

[1]. Aliguliyev, R., Aliyev, A. (2002). "Economic characteristics of information technology", Baku, Elm [«Экономические особенности информационных технологий», Баку-Элм], 33-35, 37-40.

[2]. Injazz J. Chen and Karen Popovich.(2003). Understanding customer relationship management (CRM). People, process and technology. Business Process Management Journal, Vol. 9 No. 5, 672-688.

[3]. HishamSayedSoliman. (*June 2011).* Customer Relationship Management and Its Relationship to the Marketing Performance. *International Journal of Business and Social Science Vol. 2 No. 10;166-182.*

[4]. Oliver Mack, Michael C. Mayo, AnshumanKhare. (2/2005). A Strategic Approach for Successful CRM: A European perspective. Problems and Perspectives in Management,98-106.

[5]. Akbarov, M.G. (2011) Electronic commerce. Baku: "University of Economics" Publishing House [Elektronkommersiya. Bakı: «İqtisadUniversiteti» Nəşriyyatı],212.

[6]. http://www.successwithcrm.com/blog/smarter-action-oriented-crm-data-the-stuff-that-really-counts.

[7]. Hashimova, K.K. (2014). Advertising problems in the Internet and their solution methods. Express-information, Baku, "Information Technologies" publishing house [İnternet mühitində reklam problemləri və onların həlli yolları. Ekspress-informasiya, Bakı, "İnformasiya texnologiyaları" nəşriyyatı],58.

[8]. LIus G. Renat, CarlsCabre. (may 2007). How to improve a CRM strategy. IESE Business School, University of Navarra. WP no 690, 26.

[9]. http://www.portafolio.co/economia/finanzas/10-mandamientos-servicio-cliente-236540

[10]. Bing Liu. (May 2012). *Sentiment Analysis and Opinion Mining*, Morgan & Claypool Publishers, 168.

[11]. OuyangChunping, Liu Yongbin, Zhang Shuqing and Yang Xiaohua.(2015). Opinion Objects Identification and Sentiment Analysis. International Journal of Database Theory and Application Vol.8, No.6, 1-12.

[12]. Xing Fang and Justin Zhan. (2015). Sentiment analysis using product review data. *Journal of Big Data*,2:5, 14

[13]. Alakbarov,R.,Pashayev, F.,Hashimov, M. (January 31, 2016). Development of the Method of Dynamic Distribution of Users' Data in Storage Devices in Cloud Technology. // Advances in Information Sciences and Service Sciences (AISS), Vol. 8, Number 1.

[14]. Thomopoulos, N. T.(1980). Applied Forecasting Methods. Prentice-Hall, New Jersey.,369.