Database Marketing Tools for SMEs

The case of RFM Model

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Abstract— S_mall and medium-sized enterprises (SMEs) are the engines of global economic growth. In the today competitive environment consumers demand a more personalized treatment and products and\or services that better meet their needs. SMEs can successfully remain in the global market if they can respond to the customer needs. Notwithstanding Database marketing is a crescent usefulness tool, which SMEs would benefit from marketing campaigns to enhance market visibility, global positioning, and strategic advantage in the new economy, many SMEs don't have tools for the extraction of knowledge from their databases. This paper presents an inexpensive alternative for SMEs, to knowledge extraction from marketing databases, using RFM model, to guide the development of marketing activities._

Keywords:ve Advantage; Database Marketing; RFM Model; SMEs

I. INTRODUCTION

Small and medium sized enterprises can gain a competitive advantage and a sustainable business by adopting the appropriate tools. Marketing and sales will be successful if supported by appropriate databases (DB). DB properly harnessed, can bring competitive advantage of an organization over its competitors, which are an essential factor of success in today's competitive global market. To survive in the global market, with an aggressive competitiveness, a key factor for SME's is focused on the customer, particularly in its acquisition and retention.

Marketing decisions, aim to define the best strategic plan to approach the market, deciding which type of product \ service offering, which the possible target group to reach, thus opting for the best publicity campaign.

These decisions are possible only on the basis of analysis of information and data available.

The basic principles of marketing are applicable to large and small businesses [1]. Marketing in small businesses can be categorized in three levels (Fig.1): culture, strategy and tactics [2]. At the base of the pyramid, we have the culture, which represents the analysis of consumer needs. Tactics appears in the middle level, sustained by the analysis of the 4Ps (Product, Price, Place, Promotion) to influence the performance and growth. At the highest level, strategy promotes the development to enhance actual and potential market position.
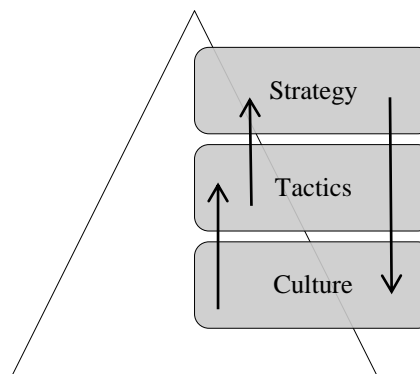

Figure 1. Categorization of marketing in small and large businesses.

Some authors have mentioned the lack of ability of SMEs to make strategic marketing decision [3, 4], which is justified in the way of acting managers, taking most decisions alone, so the decision making is according to personal and business priorities at any given time.

This paper is organized as follows: after this introductory part we are providing some backgrounds of marketing database marketing and RFM model; then is presented a guide for customer segmentation through the practical application of customer segmentation using the RFM model; finally we draw some conclusions about the importance of using RFM model in SMEs as competitive advantage.

II. BACKGROUND

Traditionally, marketing planning and its execution were hampered in SMEs by different obstacles: financial constraints, lack of marketing expertise, small size and scarce use of specialists [5]. Recent in marketing literature, contribution claim that the absence of marketing strategies and formal planning in SMEs should not be interpreted generally as being an absence of marketing [6]. The SMES have specific forms of marketing, differentiated from the usual conventional and structured way on large companies [7].

Organizations should develop their strategies in order to acquire competitive advantage over their competition. The concept of competitive advantage was initially treated by Ansoff [8].

Competitive advantage can be understood like searching for a unique opportunity that will give the company a strong competitive position. Markets become more competitive and many organizations understand and recognize the importance of keeping existing clients. The benefits associated with customer loyalty are widely recognized in business.

Researchers argue that customer loyalty is fast becoming "the currency market of the XXI century". This is a vision that supports the need for strategists, entrepreneurs and marketers to adopt a customer-centric vision [9, 10, 11, 12].

A. Database Marketing

The basis of Database Marketing (DBM) is that part of the communication of organizations with their customers is direct [13]. Nowadays database marketing approach is differentiated by the fact that much more data is maintained in databases, and are used in more sophisticated ways. In marketing perspective, the DBM is an interactive approach to marketing communications, which uses addressable communication media, such as mail, Internet and telephone [14, 15], or DBM is a strategy that is based on the premise that not all customers are equal, and the collection of data, maintenance and analysis of detailed information about customers and marketers can modify marketing strategies [16]. DBM involves gathering information about past, current and potential customers, to build a database that improve the marketing effort. DBM is the art of using the data collected, to create new ideas to make money [17, 18], or add other user information (transaction history, lifestyle, etc.) in a database, and use them to create customer loyalty programs, to facilitate contacts and to enable marketing planning [15, 16, 19]. Some authors refer DBM as a marketing tool oriented to databases, that increases the focus of the strategies of the

organizations [20, 21, 22]. We can say that DBM is the process that uses the data stored in database marketing, in order to extract relevant information to support marketing decisions and activities by understanding customers, which will satisfy their needs and anticipate their desires.

B. RFM Model

There are several direct marketing response models using consumer data, among them, one of the classic models, known as RFM model, this model identify customer behavior [23, 24], determining the probability of consumers responding to a direct marketing promotion based on the recency of the last purchase, the frequency of purchases over the past years, and the monetary value of a customer's purchase history [25, 26], and is a good model for SME's.

The RFM model is a model used to analyze and predict customer behavior [27], and is the most frequently adopted segmentation technique, focuses on the three behavioral variables: recency, frequency, and monetary value, which are combined into a three digit RFM code, covering five equal quintiles. Recency represents the time period since the last purchase; frequency is the number of purchases in a given period of time; while monetary is the amount of money spent in this time period [28]. These three variables are considered powerful predictors of future behavior and are the basis of database marketing These variables can be used to segmenting customer's behavior from databases. Recency enables the prediction of future value, while frequency and monetary value enable the estimation of the current value. The combination of these three dimensions (RFM) combines analysis of current and future customer value. The higher the RFM score, more probable it is for a customer to respond to a marketing action. Then, organizations may maximize the return on campaigns and minimize marketing costs.

III. RFM MODEL APPLICATION

The RFM model, allows the quantification of customer behavior through the development of a quantitative framework and allocating customers by behavioral patterns, and subsequent grouping segments, promoting perform an economic feasibility analysis at the level of future promotional investments SMEs can use RFM analysis to determine whether and how to invest in their direct marketing customers. The RFM model only works with data from existing customers. The basis for its operation is the purchase customer history, the customer database, represented in Fig.2. We can export customer data and their transactions to a spreadsheet.
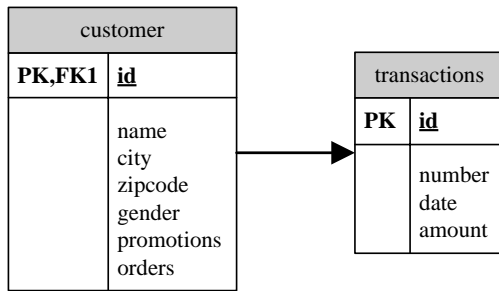
Figure 2. Customer purchase history

Recency, frequency and monetary value analysis are calculated separately. Posteriorly, variables are grouped together and used to segment DB in RFM cells. In this application example we will use customer data purchase history from the first 2014 quarter of a small firm, for further segmentation by customer value.

A. Recency

Customers who have bought recently are more probability to respond to a new offer than someone who has bought long time ago. We should follow the following steps:

1) We calculate in customer worksheet the most recent purchase date in every records. We have to sort the transaction worksheet from more recent date to oldest.

2) Then let us calculate the latest date by comparing the *id* in worksheet customer, with all customers (*id*) in transaction worksheet, and returned the most recent date, which shall be calculated starting in the begin cell and replicate to the last cell, using the formula (Table 1):

$$=VLookup(id;transactions!date(range);3;0).$$

3) Now ordered the databases from the most recent date, and calculate the number of days between the analysis date (01-May-2014) and purchase date (*nDays*), starting in first record and replicate to the last one using the formula (Tab.1):

$$recentDate = analysisDate - recentDate.$$

TABLE I.   CUSTOMER ORDER BY MOST RECENT PURCHASE DATE

id	promotions	orders	recentDate	nDays
10898	15	15	26-04-2014	5
10987	10	10	12-04-2014	19
10137	7	7	13-04-2014	18
10042	8	8	23-04-2014	8
10573	9	5	14-04-2014	17
10734	5	5	26-04-2014	5
10601	7	3	20-04-2014	11
…	…	….	….	….
10920	2	2	05-01-2014	116

From the first to the last customer data record

To calculate the recency value, we need create the following auxiliary formulas, using spreadsheet option "Definition names", to calculate the recency score (Tab.2):

$$analysisDate = 01\text{-}May\text{-}2014$$

$$maxDays = Max((nDays)$$

$$minDays = Min((ndays)$$

$$rangeDays = maxDays-minDays$$

$$quintileR = rangeDays/5$$

$$qR5 = minDays$$

$$qR4 = qR5 + quintileR$$

$$qR3 = qR4 + quintileR$$

$$qR2 = qR3 + quintileR$$

$$qR1 = qR2 + quintileR$$

4) Based on created formulas, starting in first cell we can create the formula to recency score calculation, comparing nDays with the quintile score distribution:

$$rScore = If(nDays >= qR1;1;$$
$$If(nDays >= qR2;2;$$
$$If(nDays >= qR3;3;$$
$$If(nDays >= qR4;4;5$$
$$)$$
$$)$$
$$)$$
$$)$$

Now, every customer in the database is classified either a 5, 4, 3, 2, or 1 in terms of recency (Tab. 2).

TABLE II.   RESPONSE BY RECENCY AND FREQUENCY QUINTILE

id	…	recentDate	nDays	rScore	fScore
10898		26-04-2014	5	5	5
10987		12-04-2014	19	5	4
10137		13-04-2014	18	5	3
10042		23-04-2014	8	5	2
10573		14-04-2014	17	5	2
10734		26-04-2014	5	5	2
10601		20-04-2014	11	5	2
…	…	…	…	…	…
10920		05-01-2014	116	1	1

B. Frequency

The frequency represents the number of iterations between the customer and the organization in a given period. To calculate the number of customer purchases we use the following formula:

$$nPurchases = CountIf(transactions!\$id;id)$$

We need need create the following auxiliary formulas, using spreadsheet option "Definition names" to calculate the frequency score (Table 3).:

$$maxPurchases = Max(nPurchases)$$

997

$$minPurchases = Min(nPurchases)$$

$$rangePurchases = maxPurchases-minPurchases$$

$$quintileF = rangePurchases/5$$

$$qF5 = qF4+quintileF$$

$$qF4 = qF3+quintileF$$

$$qF3 = qF2+quintileF$$

$$qF2 = qF1+quintileF$$

$$qF1 = minPurchases$$

Now, we can create the formula to frequency score calculation, comparing nPurchases with the quintile score distribution:

$$fScore = If(nPurchases>=qF5;5;$$
$$If(nPurchases >=qF4;4;$$
$$If(nPurchases>=qF4;3;$$
$$If(nPurchases>=qF2;2;1)$$
$$)$$
$$)$$
$$)$$

Then, the division is made into quintiles numbered from 5 to 1.

C. Monetary value

The database before the data are separated into quintiles must be ordered by the total value of purchases per year, per month or on the timeline indicated for the business. We then quintiles, ordered 5 (spend more) to 1 (spend less).

To calculate the customer total amount we use the following formula:

$$tAmount =$$
$$SumIf(transactions!id(range);id;transactions!amount(range))$$

To calculate monetary score, we need create the following auxiliary formulas, using spreadsheet option "Definition names":

$$maxAmount = Max(mScore(range))$$

$$minAmount =Min(mScore(range)))$$

$$rangeAmount =maxAmount-minAmount$$

$$quintileM=rangeAmounts/5$$

$$qM5 = qM4+quintileM$$

$$qM4 = qM3+quintileM$$

$$qM3 = qM2+quintileM$$

$$qM2 = qM1+quintileM$$

$$qM1 = minAmount$$

Based on previous formulas, we can create the formula to monetary value score calculation, comparing tAmount with the quintile score distribution:

$$mScore = If(tAmount>=qM4;5;$$
$$If(tAmount >=qM3;4;$$
$$If(tAmount >=qM2;3;$$
$$If(tAmount >=qM1;2;1)$$
$$)$$
$$)$$
$$)$$

Then, the division is made into quintiles numbered from 5 (greater total amount) to 1 (smaller total amount).

D. RFM score

The RFM analysis depends on RFM scores, but the real power of the technique comes from combining them into a three digit RFM, which is performed through the concatenation of the three variables. The RFM ranges from a maximum score of 555 to the minimum score of 111. And the formula is:

$$RFM=fScore \text{ \& } rSore \text{ \& } mScore$$

The higher the RFM score, more important and profitable the customer is to the business, now and in the future. Customers with higher RFM rankings, will be probably those who will continue to buy and to respond positively to marketing promotions.

Customers with lower RFM score, will be probably those who do not will continue to buy and to answer promotions. Customers with high RFM score represent future business potential, because the customers are interested in doing business. With RFM we can decide who to promote to and predict the response rate and increase customer loyalty and profitability (Tab.3).

TABLE III.　RFM SCORES

rScore	nPurchases	fScore	tAmount	mScore	RFM
5	10	5	$ 5.780,00	4	554
5	7	4	$ 3.710,00	3	543
5	5	3	$ 3.294,00	2	532
5	3	2	$ 1.709,00	1	521
4	1	1	$ 270,00	1	411
3	1	1	$ 700,00	1	311
2	1	1	$ 685,00	1	211
1	1	1	$ 618,00	1	111

IV. CONCLUSIONS

The RFM model revealed interesting customer segments that could be targeted using appropriately designed marketing campaigns. We believe that RFM model will provide significant business value for SMEs. This model is known and appreciated for its simplicity,

since it can be used without requires specialized statistical software, and also their results are easily understood by users. This paper provides a comprehensive review on the application of RFM model to customer segmentation. In the absence of other targeting techniques, RFM model can lead to an increased response to promotions. The RFM score can be applied indiscriminately to any business or activity and, having only to be set. This model helps marketers visualize and quickly identify the most valuable customers, which will allow developing a marketing effective strategy.

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