Real-Time Marketing for Banking Sector

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Abstract

In today’s competitive environment, marketing has become increasingly critical to business success across all sectors. The fast paced technology evolution has made effective marketing an extremely challenging task because consumers nowadays have access to information on a global scale and thus are more informed and knowledgeable. The challenge is even more pronounced in the financial sector due to the mistrust of the capacity of financial institutions in the current economic environment. In order to survive and thrive in the financial crisis, it is of great importance that these institutions conduct more focused marketing campaigns and promote their products to appropriate segments, at the right time and in the right place.

During the past few years, Real-Time Marketing has become increasingly popular as an important marketing tool to provide relevant and updated information in a timely manner which allows companies to proactively respond to consumer needs, requirements and complaints.

This dissertation presents a methodology based on this concept, which aims to improve the quality of service marketing in banking sector. The proposed methodology is based on the integration of four linked blocks: Data Source; Configuration Module; Marketing Rules Engine; and Performance Visualization and Alert System. By chaining these blocks, it is expected that real-time marketing information flow can be generated. The Methodology has been applied to two business scenarios simulated with real data from a Portuguese bank.

Keywords: Real Time Marketing, Decision Process Support, Key Performance Indicators, Marketing Rules Engine, Alarmist Management, Forecasting Behavior.
1 Introduction

Marketing is playing an increasingly important role in business success in today's competitive environment. This is driven by fast and continuous development in Information and Communication Technology, such as the Internet, wireless networks, high speed digital networks, analytical software, and smart phones, which are increasingly capable and adapted, enabling communication and data transfer without restrictions of time and place. For example, social networking sites are now the major "meeting points" for not only individuals but also businesses and their current and potential customers. More and more businesses have started using social network tools in order to quickly and dynamically interact with customers. According to Grupo Market [1], in Portugal 3 million people has used social networks in 2011.

Today, people can browse products and services information online and make purchases in a global marketplace, 24 hours a day, 365 days a year [2]. In addition to technological innovation and globalization, other forces also drive the redesign of business strategies, for example, the deregulation and privatization occurring in various economies [3]. Therefore, organizations should be constantly updated with real time market information to ensure that they can receive, analyze and act on a flow of information that describes dynamically the market environment and its internal operations [4].

Since the beginning of the current economic crisis in 2008, the importance of marketing has become even more pronounced in the financial sector, due to the mistrust of the capacity of financial institutions. These organizations should conduct more focused marketing campaigns and promote their products to appropriate segments, at the right time and in the right place to survive in the crisis and to stay ahead of the competition. This requires a mechanism that is agile enough and economically viable to manage marketing campaigns and to monitor and identify potential events and trends in a given context, automatically. Without such a mechanism in place, businesses could face loss of business opportunities and low level of customer satisfaction. In Portugal, even in highly regulated industries like the banking industry, 46,795 complaints were made by bank customers between 2008 and 2010 [5] [6]. Contributing to this reality are the high costs associated with operation of Information Systems (IS) which in the time of economic downturn prevents their adaptation to business needs. The inadequacy of the data models used in marketing support is also a constraint preventing prompt querying, reporting and data analysis in order to respond to dynamic business objectives [7].

Against this backdrop and with the aim of improving the performance of the processes of Relationship Marketing the concept of Real-Time Marketing has gained a lot of attention in recent years. This type of marketing aims to create a process to provide relevant and updated information in a timely manner so that companies can proactively respond to consumer needs, requirements, and complaints.

This paper presents a methodology which aims to improve the quality of marketing activity in the banking sector, taking into account the concept of Real-Time Marketing. The proposed methodology is based on the integration of four linked blocks: Data Source, Configuration Module, Marketing Rules Engine; and Performance Visualization and Alert System. By chaining these blocks, it is expected that
real-time marketing information flow can be generated which begins with the acquisition of data from their sources and ends with the updated data with the result of actuation of the mechanism proposed.

The Methodology has been applied to two business scenarios simulated with real data from a Portuguese bank to demonstrate how the new methodology can help the bank accelerate and improve the process of decision making in marketing. This paper is produced as part of a pilot project for Deloitte Portugal.

The remainder of this paper is organized as follows: Section 2 discusses related work; Section 3 presents the research methodology used; Section 4 explains the proposed methodology to address the problems mentioned earlier; Section 5 discusses the case study; and finally Section 6 summarizes the paper and elaborates on future work.

2 Related Work

This section outlines some important topics on the concepts related to marketing and the current practices and trends with regard to issues related to this research.

2.1 Market Segmentation

Segmenting the market is to divide it into groups with similar characteristics or interests. The data used in this process can be obtained from internal sources such as direct channels and legacy systems or from external sources such as reports by accredited entities. A study by Deloitte Portugal [8] in 2010 predicts that by 2020 there will be an increased degree of utilization of all dimensions used in segmentation process, with a particular emphasis on behavioral and psychographic dimensions.

2.2 Shared Services Centre

In many organizations, marketing function has been decentralized which makes it difficult to obtain an overview of marketing activities and to manage it effectively. To address this problem, many organizations have invested on Shared Services Centers. Shared Services centre typically refers to a business unit that provides a shared business function among others where it was previously handled by different business units separately. Cost saving is usually the main reason that an organization will opt for shared services because it standardizes the whole process and thus makes the business function more efficient.

2.3 Customer Relationship Management

Customer Relationship Management (CRM) is a set of processes, software and methodologies used by organizations to better meet the needs and behaviors of customers in order to create strong relations with them. The cost of gaining new customers can be up to five times more than keeping a customer, due to advertising costs, explanation of procedures and opening processes. The CRM architecture can be
broken down into three categories: Operational CRM, Analytical CRM and Collaborative CRM [9], each of which serves different purposes but closely related to each other at the same time.

Measuring and valuing customer relationships using indicators, such as churn rate, life time value and retention rate, plays an important part in an organization’s marketing strategy. By obtaining accurate value of these key indicators, organizations can benefit from significant cost reductions in their direct marketing process, especially in customer acquisition and retention. This approach has greatly improved the traditional marketing techniques which focus on key elements of the “marketing mix” [3] - product, price, promotion and place - without taking customer relationship into consideration.

2.4 Business Intelligence Systems

To stay ahead of the competition in today's competitive market environment, it is crucial for organizations to operate in a system with a high level of analytical capability to help understand market demand and to forecast growth, competition, trends and customer needs. As a result, many organizations are adopting Business Intelligence (BI) tools and systems to support their marketing practice. These systems have complex infrastructures in order to collect, transform, analyze, manage and present data, and provide companies with accurate and current information to help them make sound business decisions. However, it should be borne in mind that many of the infrastructure data can be "old" and thus could result in a poor quality decision.

2.5 Dashboards

Dashboards are interactive interfaces available to business users to give specific information about the state of the business, typically through Key Performance Indicators (KPIs). The visual elements like graphs and charts focus user attention on the key trends, changes and deviations. The interfaces of the dashboards are today very important to support the activities of marketers, monitoring, for example, the effectiveness of campaigns and levels of customer satisfaction. The following are examples of some typical marketing KPIs [10]:

- Number of new campaigns
- Number of new customers
- Number of complaints
- Life time value variation
- Retention rate variation
- Market shares changes

2.6 Related Projects

This section presents some interesting and innovative projects or research conducted recently in the marketing field.

In year 2007 to 2009, Dutch bank ING Bank has to rebuild its marketing technology infrastructure because many of their marketing campaigns were not relevant to the bank's customers [11]. The bank's organizational structure, processes, applications, and their heavy reliance on direct mail failed to meet the
needs of the multichannel bank with a strong Internet focus. By implementing a centralized campaign management program that creates personalized marketing campaigns in real time which are delivered in multiple channels, ING has significantly increased the average campaign response rates and expect to reduce direct marketing costs by 35% per year.

A Master dissertation [12] at Instituto Superior Técnico titled “Location Based Targeting and Ranking for Online Advertising” studied the techniques of retrieving geographic information for geo-referenced advertising taking into consideration not only its thematic content but also its geographical context. As main conclusion, it was shown that geo-referenced advertising can be addressed through decomposition, study and optimization of the following three tasks independently: (i) determine the geographical scope of web pages, (ii) classify Web pages according to their geographical interest, and (iii) determine which ads are most relevant to a given page. Banking sector can also benefit from geo-referenced advertising. Bank Web pages can be tailored to different geographical interest and in fact geographical information can be applied to all channels of contact.

There are also some projects investigating flows of social data on the Web. An example is the tool Mood of the Nation, developed by researchers at the University of Bristol (UK), to identify emotional standards of happiness, sadness, anger and fear, based on data from published content on Twitter, geo-referenced by users UK. This kind of information provides a valuable external resource for marketers to understand the behavior of the mass population to help them target the right people at the right time.

3 Research Method

Case Study Research has been used as the research method for this research because it is the main qualitative methodology for research in IS when the object of study focuses on organizational rather than technical issues. It has also been widely used in marketing [13]. The study was conducted in cooperation with Deloitte who provided a professional internship in the area of financial services consulting and technology integration. The ultimate goal is to demonstrate how the proposed methodology can help Deloitte clients, in the financial services sector, to improve the process of decision making in service marketing and produce more accurate campaigns.

4 Proposed Methodology

This section proposes a methodology developed to improve the quality and effectiveness of marketing in banking sector supported by real-time information systems. The methodology aims to mitigate some of the problems discussed earlier, particularly: data models not sufficiently flexible to support marketing activities, gap of business and timing context elements to execute campaigns, and gap in analysis and alert mechanisms to predict customer behaviors and market trends. The goal is not to implement a disruptive change in the way the organization manages its marketing process, but to provide more value to this service through the creation of a continuous and real-time information flow. Figure 1 outlines the
proposed methodology as block diagram ordered as follows: Data Source; Configuration Module; Marketing Rules Engine; and Performance Visualization and Alert System.

Figure 1 – Proposed Methodology: Real-Time Marketing for Banking Sector.

4.1 Data Source Definition

At the first stage, a Marketing Data Mart (DM) should be built as the central data source for the continuous real-time information flow. To define data model requirements, the 4-step dimensional design process proposed by Kimball [14] has been applied: Business Process, Grain, Dimensions, and Facts. The core business processes in the banking sector have been identified as: client, account and event. The grain should always be 1 in order to achieve an individual characterization for each case. Fact tables are built for each process with shared dimensions in time, location and people. The main sources of data to Data Mart should be the following:

- **Data Warehouse (DW)** – to get organization business data;
- **External Sources** – to get external data that can improve the vision of the business and help identify market trends (e.g. statistical data of population, market forecasts and flows of social data on the Web);
- **Operational Systems** – to get data that are not updated as often as necessary in the DW.
4.2 Configuration Module

This block contains the necessary components to characterize the context of a marketing campaign, which are:

- **Context of the campaign** – to define the basic parameters needed to be taken into account when planning campaigns such as name, start date, end date, objectives and type of analysis;
- **Internal and external indicators** – to choose which indicators to use for analysis and monitoring of the campaign according to the data model;
- **Resources** – to identify resources to be included in the campaign such as human resource, financial resource, and facilities;
- **Actions** – to get the actions envisaged under the action campaign.

Marketing Data Mart is used as source and each configuration created is saved in parameterization tables.

4.3 Marketing Rules Engine

This engine runs on the Marketing Data Mart and uses the information defined in configuration module as the basis for creating rules. Two key components should be highlighted:

- **Create new indicators** - combine existing indicators which can be assigned different weights and thresholds;
- **Create customized marketing rules** - define rules which trigger alerts in accordance with the variation (%) in time of the chosen indicator.

For each rule, 4 configurations should be specified: location type (e.g. country, district, and city), location name, alert type and its priority to be triggered. Dynamic queries are then created under the data model with the underlying logic to calculate key performances indicators assessed against the rules.

4.4 Performance Visualization and Alert System

To display the status of each rule, dashboards are suggested to be applied to provide an overview of the indicators being tracked. The alert system aims to warn marketers of the existence of certain events identified by the marketing rules engine, which means the triggering of a rule.

5 Case Study

In order to validate the proposed methodology, two business scenarios are presented which intend to simulate the applicability of the methodology in real life. A DM was first created by applying the proposed data model and using a segment of the database of a Portuguese bank as data source. To provide context configuration and marketing rules a web application was developed. Finally, results generated by
using customized rules and new indicators have been compared with the results using marketing standard rules and single indicators.

**Scenario 1**

This scenario intends to track the behavior of young working customers in 2008. To achieve this, the balance of their current account (Indicator A) was monitored using the following rules:

- Standard rule with 500 as lower threshold and 2000 as upper threshold;
- Customized rule to detect monthly variations exceeding 40% and less than -25%.

Figure 2 outlines the tracking of indicator A using both rules.

![Figure 2: Balance Amount Indicator from Current Accounts of Young Workers Customers in 2008.](image)

As can be seen from the graph, 5 alerts were triggered in total. The 4 alerts marked with "MTR", were triggered by customized rule which intends to detect patterns in the variation of the indicator. The remaining one alert generated during November was triggered by the standard rule as the indicator exceeds the upper threshold.

**Scenario 2**

This scenario intends to track the loyalty of middle-aged customers in May 2008. To achieve this, a new indicator (Indicator B) was created taking into account two single indicators - the number of complaints made and the account balance. Figure 3 shows how Indicator B is calculated.

Parameters used are explained as follows: i – single indicator, O [i] - Optimal Value, C [i] - Critical Value, V [i] - indicator value, w [i] - weight, K [i] - contribution in the new indicator.

\[ m = \frac{1}{(|O[i] - C[i]|)} , \quad b = 1 - m \times \max(O[i], C[i]) \text{ or } b = -m \times \min(O[i], C[i]) \]

The value of the new combined indicator is \( \sum_{i=1}^{n} K[i] \), where \( n \) is the number of single indicators the new indicator combines.
In this scenario, the parameters are set as follows:

- **Indicator 1**: Number of complaints. Optimal Value = 5, Critic Value = 20, Weight = 60%
- **Indicator 2**: Account Balance. Optimal Value = 6000, Critic Value = 1500, Weight = 40%

Using the new indicator a customized rule was created to detect if every other days variations exceed 30% or if daily variations are lower than -20%. Figure 4 outlines the tracking of this rule.

9 alerts were triggered. Four alerts (red) were caused by daily variations being lower than -20% and five alerts (green) caused by variations exceeding 30% every other days.

Figure 5 and Figure 6 show the tracking of the number of complaints and account balance as separate indicators.
Looking at each indicator individually, two alerts would be triggered due to the number of complaints being higher than 20 and 5 alerts would be triggers because the account balance has exceeded 6000.

**Discussion of the Results**

As can be seen from the case study, using customized marketing rules with the variation in time can greatly help marketers recognize and anticipate customer behavior. The 4 alerts triggered by the customized rule may indicate a good time for new business opportunities whereas they cannot be identified using the standard rule.

The ability to create new indicators from other existing indicators also appeared to be able to provide valuable information for marketers. If two or more indicators can influence the same objective, then, as demonstrated in scenario 2, they can contribute to the creation of a global indicator related to the goal. For example, on day 16 although none of the indicators have reached their thresholds to launch an alert, the combination of both results indicates a poor performance that should cause concerns.

**6 Conclusion and Future Work**

The Methodology presented aims to create a continuous flow of real-time information to help marketing to face today's challenges. The creation of indicators and customized marketing rules give greater autonomy to marketers. The combination of different indicators in a global indicator allows marketers to obtain a more global view on certain objectives. Customized rules especially with variation in time help forecast customer behaviors. Using a Data Mart adapted to marketing needs allows using dynamic querying to create new indicators and customized rules.

In the future, the methodology could be tested in other sectors. The use of tools that illustrate graphically the dependency relationships between the indicators e.g. dendrograms [16] could be useful to detect new market trends. The use of advanced predictive models in marketing rules and real-time decision tools for customer interaction are also relevant subjects.
7 References


