

$$E = (Dm)^2$$

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Abstract

Banca Popolare di Milano's objective for this project is the rapid implementation of a "listen-and-answer" approach to customers' needs and behaviour.

You could define this approach as Database Driven Direct Marketing; i.e. an efficient management of Customer Relationships based upon the following tenets:

- 1. a dedicated data infrastructure, organized in a customer centric fashion, containing all the key anagraphic, demographic and behavioral information upon which you can differentiate your customers in segments;*
- 2. the tools and the competences required to analyze your customers, drive and measure your CRM Campaigns and produce a Profit and Loss statement for your marketing activities;*
- 3. the set-up and training of a dedicated team for CRM Management, driving the Marketing Campaigns and customer interaction;*
- 4. the integration of this application with the current CRM application in order to deliver all of the above to 1.2 Million Customer via a network of 450 Branches and over 4.000 strong Sales Organisation in the most **Efficient** and **Effective** manner.*

*The Marketing **Datamart** for **Datamining** is one of the Bank key components for adding value to our on-going implementation of a new Customer Centric Sales re-organisation.*

The Datamart is based on SAS Warehouse Administrator, the strategic platform used in BPM for data management, which seamlessly integrates with SAS Enterprise Miner, the tool of choice for creating our "Business Intelligence" Marketing factory.

1. Introduction

From a general point of view the goal of the marketing departments of Italian banks is, today more than ever, to increase the average profitability level per customer. To gain a competitive advantage, banks have the opportunity to exploit the enormous amount of data at their disposal to get to know their customers better: To understand their preferences and needs in order to increase their loyalty and motivation.

From a concrete point of view data mining activity should supply the marketing decision makers with operative tools for the evaluation of client potential, the planning of an integrated offer, for the selection of Campaign targets and for cross selling. But the opportunity and capability of deriving the right decision at the right time is just one side of the apple: the existence or the construction of a well integrated Contact and Campaign Manager is a required element "to sell" the Business Intelligence Factory's production.

2. Presentation of BPM and Nunatac***2.1. Banca Popolare di Milano (BPM)**

Established in 1865 as a regional bank, Banca Popolare di Milano is now an Italian nationwide bank ranked 13th in Italy and 234th in the world by the Bankers Almanac 2000. BPM is a co-operative bank with more than 114.000 shareholders, 482 branches, over 1.2 Million customers and 6460 employees.

The BPM group offers a full range of banking services to both consumers and corporates and it is one of the most innovative institutions with new channels (Call Centre, Internet Banking and PC Banking).

2.2. Nunatac

NUNATAC is a European Quality Partner of the SAS Institute, composed of a group of professional consultants with statistical, computing and marketing skills.

The defining characteristic of NUNATAC is the combination of specific abilities and a well developed "know-how" in the field of Database Marketing.

Over the course of the last 7 years, Nunatac has developed vertical market capabilities in the following sectors: Banking, Insurance, Mail Order and the Automotive Industry.

3. BPM's Marketing Strategy: the new listen and answer approach.

The new Marketing Strategy to listen to and answer our customers was approved three years ago and it originated one of the biggest change management projects ever seen in BPM. The Sales and Marketing Division is currently being re-organized in order to better serve and meet our customers' requirements.

The re-organisation effort, called PRO (Professionalism, Relationships, Objectives), is a wide reaching project with investment of over 100 man years, involving over 4400 people and with investments of several million Euro.

In order to meet our customers' needs and to support our new organization the following key objectives have been identified for the Marketing Group:

- a) Focus on current customers (decreasing attrition and increasing customer loyalty) by "listening" and measuring their behavior.
- b) Listen to our customers' specific needs and driving a segment centric marketing approach (Investors, mass market, small business etc.) in all our marketing initiatives and campaigns.
- c) Driving cross-selling activities: increasing the type and mix of products sold to our current customer base with particular regards to products with the highest value adding component and profitability for the Bank.
- d) Giving concrete answers to the increasing infidelity of customers, whilst reducing the time to market for new products and initiatives.

4. Goal of the Project: to implement a Business Intelligence Factory in the most Efficient and Effective manner

The Mission for the CRM and Data Mining Team in the Marketing Department is to "Analyze and add value to the Marketing information assets in order to identify commercial opportunities which are: feasible, coherent with our objectives and measurable".

We are a service oriented team whose primary business need is to satisfy the expectations of our internal customers as well as our end customers at large. We quickly identified the key variables, which determined the degree of satisfaction of our internal customers, i.e.:

- a) High-speed delivery of information for Decision Support
- b) Support for multiple marketing campaigns within a tight schedule
- c) Overall quality of our services.

In order to deliver on these key variables we have set out a cross-functional team with our MIS Department, the primary objective was to work on a nine-month schedule in order to deliver the first release of a full "information factory".

The key "rules" for the project were as follows:

- a) Clear and common objectives, documented and shared in the most appropriate manner with specific time horizons
- b) Speed & Results: quick incremental delivery - the first "temporary" datamart was delivered in 60 days.
- c) Quality - get the best product and the best partners, ROI will follow.

In order to build a "lean" Business Intelligence factory meeting the criteria of efficiency and effectiveness we defined the key parameters for the project, which are:

- a) Security - given the confidential nature of the information we process
- b) Data quality
- c) Openness and conformity to company standards: in order to support and improve the system over time
- d) Scalability- as we will gather and analyze more information over time
- e) Independence- we do not want to impact on other operational systems
- f) Ease of use - to guarantee users' independence
- g) Richness of functionality - in order to guarantee the effectiveness of the Data Mining Group
- h) Performance and reliability: to guarantee the efficiency of the Data Mining Group.

Based upon this principle the cross-functional team moved quickly into an extensive evaluation phase of application, tools and partners, which lead us to choose SAS Institute and Nunatac to work on the project outlined in the following sections.

5. Project Description: BPM's Marketing Datamart for Datamining

5.1. General features

BPM's Marketing Datamart for Datamining is the project of the bank aimed at providing the Sales and Marketing Division with the necessary data and appropriate tools for reaching the best informed decisions.

The ground on which this project was based was very fertile, in that:

- Management had already invested in a Marketing Information System (MIS) dedicated to central and local campaign management and business reporting;
- The extremely important matter of identifying a unique, company-wide definition of a customer had already been dealt with and was no longer an issue;
- The company was ready to move on to bigger and better things.

Fig. 1

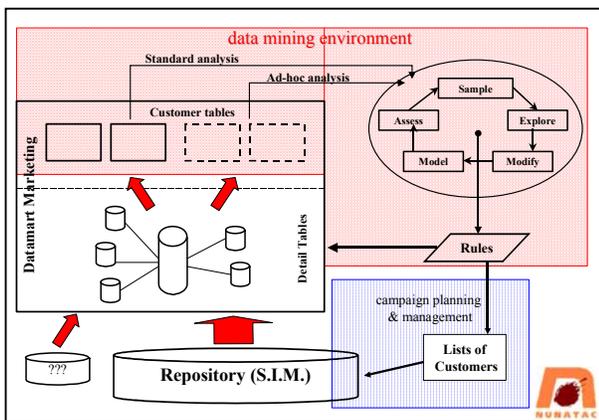


Fig.1 represents the general structure of the project where the MIS is both the starting and ending point of the loop. It is the Marketing Datamart's main source of data and, at the end of the cycle, it manages contacts with the customers identified by the data mining portion of the process.

To guarantee the maximum flexibility, data miners have two levels of detail at their disposal. Standard

analyses, such as Behavioral Segmentations, are based on predefined Customer Tables. While ad-hoc analyses, such as Scoring Systems for specific campaigns, often have to create their own Customer Table on the fly, extracting and transposing detail data.

5.2. Logical Data Model

The detail tables of BPM's Marketing Datamart play the role of an historical repository from which to gain a better knowledge of customer profiles. In this detailed data structure you have to collect all the pieces of information about each single account, each single contact between the bank and the client, over a significant series of periods (e.g.: 36-60 months).

That means the detailed tables are not the proper input datasets for a customer centric data mining activity. In fact, in order to perform this activity, you have to deal with denormalized datasets where:

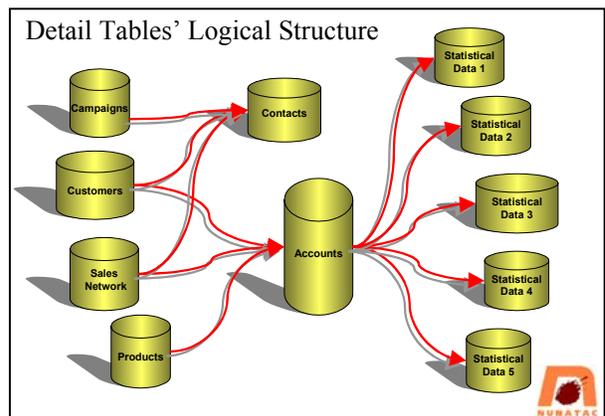
- one customer corresponds to one record,
- columns summarise the different relevant aspects of the client's characteristics and behaviours.

We call such datasets Customer Tables.

The Logical Data Model of the Datamart detail structure attempts to reach an ideal compromise between:

- adherence to the business model,
- consistency and integrity,
- the opportunity to keep track of history,
- maximum granularity,
- access simplicity and data extraction efficiency.

Fig.2



Customer Tables are thematic tables, organized by customer identification code. They contain summarized data regarding:

- the analysis variables, in the data warehousing terminology the facts, e.g. the number of account transactions;
- the class variables, the dimensions, e.g. account classification by product type;
- the interaction between facts and dimensions;
- the fixed time lag for summarizing the data.

A critical step in designing a customer tables is deciding the level of the interaction between facts and dimensions to control the level of granularity.

A very simple example: we consider one fact, e.g. the purchase of a financial product and we suppose that three dimensions may describe the investment:

1. The time to maturity: short, middle, long;
2. The risk level: stock only, stock balanced, bond balanced, bond only, cash;
3. The country: Home Country, Europe, U.S.A., Pacific Area, International, and Emerging Markets.

If we design the customer table considering all the interactions between the dimensions, we will create a table with $3*5*6=90$ variables (for one single fact!). Thus it's very important to design a data structure where the trade-off between information intactness and data granularity is mediated.

5.3. A functional view

We have already described the Customer Tables as thematic tables organized by customer identification code.

In a marketing data model for the banking sector we might have: a customer table for personal data, one for clients' portfolios, one for statistical data about products and services usage, one for contacts and promotions and so on.

Once the tables have been designed and the data is ready, it's possible to start the data mining activity. The results obtained by Behavioral Segmentation or by the estimate of a Scoring Model can be assigned to each customer and used for business purposes.

But, in the new "listen and answer" BPM's approach this is not enough.

In this culturally and technologically innovative context, what was once the estimate of a Scoring Model, have to become an opportunity to implement decision-making processes for the optimization not of a campaign, but the dozens of campaigns expected to come out of the future marketing plans.

In other words, if the Marketing Datamart's objective is to support decision-making processes on an industrial level, is it then possible to translate the

successive phases of this process into logical entities, which are clearly identifiable and repeatable?

What we mean is that Database Marketing activities, centered on a purpose built database, follow a precise, logical sequence of actions.

In relation to this sequence, the Database Marketing operation begins with the identification of the business issue to which an appropriate solution is required.

The business objective must therefore be translated into analytical terms and into the availability of the data needed to provide a non-trivial answer to the problem.

When we possess a significant and appropriately organized information base, we then proceed to the actual mining phase.

The results of the analysis, after having been validated, must subsequently be implemented within the company's productive process and must be compared with traditional decision-making criteria.

The final and decisive phase involves the measurement of the results obtained on the market following the action just undertaken: it is only through this procedure that we can capitalize on the experience and feed the information wealth of the database.

According to this industrial-level vision of decision-making processes, the BPM's Marketing Datamart for Datamining have to support data miners with:

1. Ready-to-use Customer Tables designed to perform standard analyses, such as Behavioral Segmentation or Customer Attrition;
2. Temporary Customer Tables, to be extracted dynamically from the Detail Tables by data miners, through a metadata user-friendly interface;
3. Enterprise Miner Templates as macro flows that act as guidelines for the realization of specific Database Marketing projects, from the tactical Scoring Systems to the more strategic Segmentations.

5.4. A technical view

Our Data Mining solution is based on a three level (or tier) architecture.

At first level we have our Operational Marketing Database (OMD), a wide data collection stored in a MVS-Mainframe DB2 dbms, integral part of our Marketing Information System (MIS).

The MIS is a client-server application based on the OMD. Through its five cooperating modules (Customer, Product, Campaign, Contact and Statistical Data), it offers a range of instruments to support the still in progress re-organization of the Sales and Marketing Division called PRO.

Both the "day by day" activity of the sale network and the links between MIS and Bank's Legacy Systems produce a large amount of data managed by the OMD (over 25 Gigabytes).

At second level we meet the Marketing Datamart, the core of the whole Data Mining system.

Once a month data are retrieved from the OMD and transported to a Unix workstation; after that, some batch processes work together to transform, join and load up data in the Datamart Detail Tables.

Our goal in Datamart definition was to realize a database strongly focused on the customer. To obtain this, the pre-loading batch processing is designed to manage big data quantity (at present time up to 70 million of records).

SAS software is strongly involved at this level: the whole data migration from OMD to Datamart is driven by SAS Warehouse Administrator and the data transformation programs were developed using basically SAS/Connect, SAS/Base and the SAS/WA automatic-generated code.

At third level we find the network: the Data Miners' PCs can link to the Unix server through the Tcp/Ip technology.

Using the Internet communication protocol we can offer Data Miners two advantages:

1. They can easily access the Datamart tables and follow the path of their analysis;
2. They have the possibility to export the data mining flows in Html language and share results with other Bank offices.

Both the Enterprise Miner components (the server one on the Unix workstation and the client one on the PCs) play a leading role in the Data Mining group activity.

6. Timing and Resources

At present, Release 1.0 of the Datamart has been implemented in production.

So far, the human resources involved and the efforts put in the project by BPM, SAS Institute and Nunatac can be summarized in that:

Work Group

BPM: 1 business analyst, 1 IT analyst, 1 data miner;
SAS Institute: 1 IT analyst, 1 SAS/WA programming analyst;
Nunatac: 1 database marketing specialist, 1 data miner.

Time efforts

Needs analysis: 25 man-days, performed by BPM;
MIS data auditing: 35 man-days, performed by BPM;
Evaluation of application tools and partners: 30 man-days, performed by BPM;

Datamart Release 1.0: 110 man-days (SAS & Nunatac consultants), 70 man-days (BPM).

7. Conclusion and Future Developments

At the time of writing the project is close to its first major Milestone, i.e. the delivery of Phase One. It is still very early days for writing the "conclusion" for the project and we look forward to share the updated results in Dublin. Therefore this section will be limited to what we have learned and achieved thus far.

7.1. Lessons Learned

- a) Data Mining is spelt with a capital "D" and a small "m". Simplistically, the amount of time and effort you need to allocate to the correct identification, acquisition and storage of your data is vastly superior to what you need to allocate to Mining if you use a good Enterprise-class data-mining tool.
- b) A cross-functional team of Marketers and MIS, with clear and common objectives is key in order to drive the process through the organization over time and without losing focus.
- c) Buy the best skills in the market. Even if you have depth of experience and competences within your team good partners will still add substantial value to your project.

7.2. Key Achievements

- a) By moving quickly and incrementally we have managed to deliver simple and effective descriptive projects, which have satisfied our customers over the course of the last eight months and managed to sustain the level of "management buy-in" for the whole project.
- b) By selecting good partners and proven technology we have managed to hit all the milestones we have set in project.
- c) Invest in people. In our market there is scarcity of good Data Miners, we have selected a team of young professional within the Bank with a mixed background (IT & Sales). By investing heavily in training and coaching we were able to build a "competitive" team in six months.

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