

# Data Mining for Advanced Customer Management

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## 1 Position of the problem

The financial sector is under a complete process of transformation regarding strategic and tactical customer management.

The main cause of this is the use of quantitative methods (data mining) for data management. This is done in order to extrapolate behavior patterns and to forecast possible conducts to define more effective business plans.

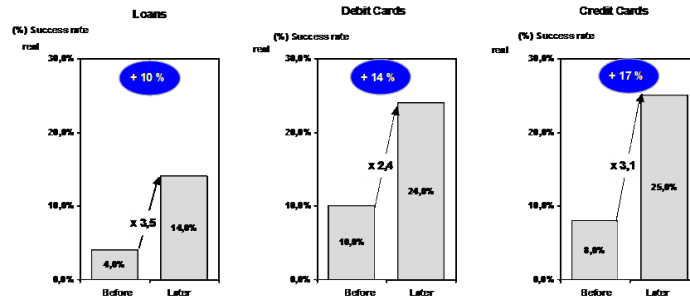
All of this is quite new when talking about marketing and business strategy, but it is not so if we focus on risks management, in which these methods have been previously applied to forecast the ability of payment or default of customers. Obviously, the existence of a regulator, like the Bank for International Settlements in Basel, and regulations, i.e. Basel I and II, has allowed this development.

If we make a closer analysis, why do we think that the current application of these techniques has been terribly underused in the business area? Moreover, why do we lately notice a significant change in trends? The following reasons might answer the questions:

- Human factor: there used to be a way of thinking in commercial areas that business knowledge was enough to identify possible customers to target for cards, funds, pension plans, etc. Strong investments in advertising and the idea that ‘the more customers we contact, the more successful our campaigns will be’, is something that, until today, has been followed by many organizations. These organizations continue to define their business strategy as focused on a ‘product’ vision, without thinking about adapting it to existing and potential customer segments.

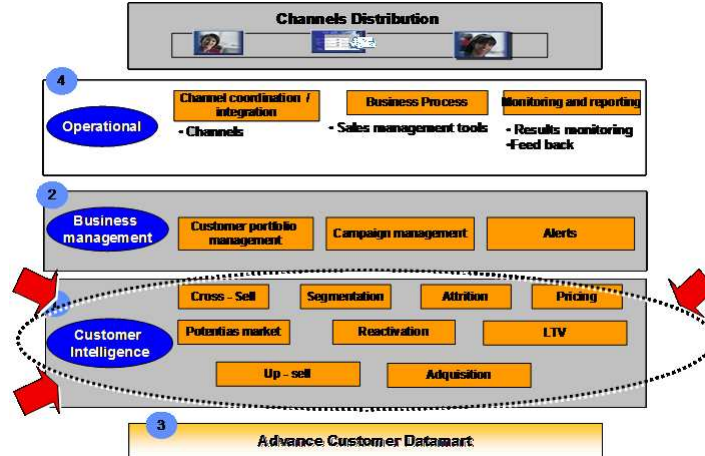
Results are the best way to convince others of the previous statements. Increases in the rates of sales obtained, thanks to the application of data mining techniques, is the trigger of this trend change.

- Distrust in unknown techniques: when a commercial or marketing director hears about algorithms of segmentation, distances, neuronal networks, etc., they may have two different reactions. On one hand, there is an admiration for the unknown, but on the other hand, they may worry about not being able to understand or explain WHY a customer has been proposed as a target of a specific business action to the sales network



The easy interpretation of results and the discovery of hidden behavior patterns are some of the keys to present data mining as the differentiating element when designing an advanced strategy in customer management.

- Department initiatives: the truth is that, currently, only a few companies have a specific structure of analytic and commercial research from the organizational point of view. Up to now, several department initiatives have been developed in order to detect ‘who are the potential purchasers of a product?’ or ‘what customers will cancel our products in the future?’ However, there are few companies that have redefined an advanced commercial strategy and created more proactive and dynamic commercial models based on the systematization of the acquired knowledge to make it regularly available for commercial networks.

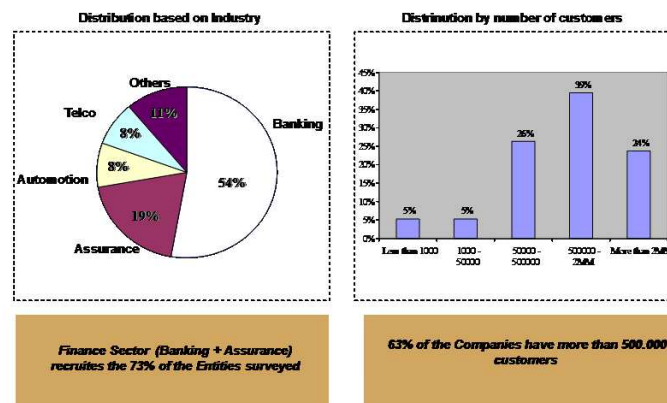


- Technology as an easy creator: up to now, any project with data analysis meant long processes of previous handling. Design and construction of advanced information data marts, with the added information of past behavior

of customers, allows us to remarkably speed up these activities, reducing significantly the amount of time and resources necessary to develop a predictive model.

However, tools have been developed that significantly reduce the amount of time to compute the mathematical algorithms needed for processing millions of records.

Next, we present the results of a survey performed over 120 Spanish companies. The results are represented in a quantitative way and reflect the current Status of Companies in Advanced Customer Management Field



#### Main Remarks

... There is a still long way to go ...

*Only 33% of the companies declare that they have a coordinated effort for customer management.*

*The financial sector (banking) is the most evolved in 'Advanced Customer Management'. There are significant differences with other sectors, such as assurance, which still stands out with a product/channel focus.*

*Currently, nearly 40% of the companies do have integrated customer information.*

*Not even 5% of the companies have calculated the following information regarding their customers: attrition risk, potential value, tendency of purchase, decision unit to which they belong, etc.*

*Only 13% of the surveyed companies declare to be applying business intelligence, (data mining) as a method to define and apply strategies and specific commercial actions. 95% of this 13 % belong to the banking sector.*

*The concept of commercial planning is mainly spread out, but the availability of management is still very limited on the companies' side.*

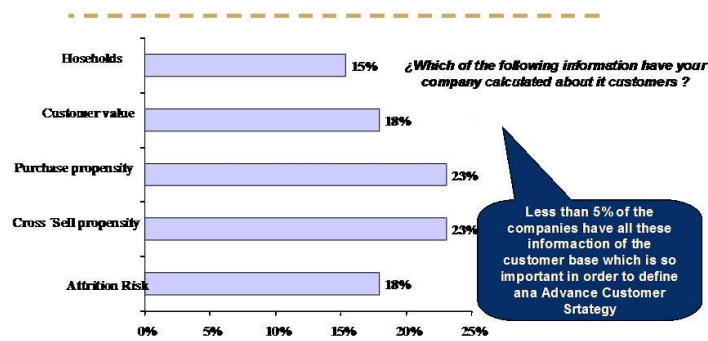
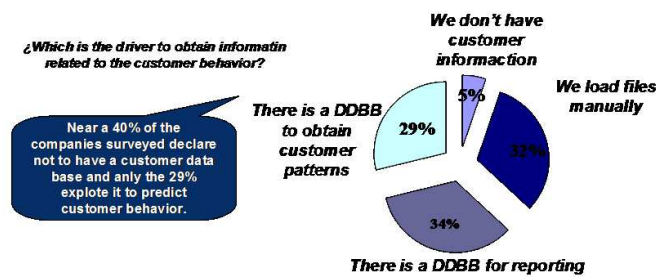
Uniquely, 8% of the companies take less than a week to design and start up a commercial campaign.

Only 34% of the surveyed companies have defined specific commercial plans for client clusters.

61% of the companies currently do not send unique selling propositions about a specific target to their commercial nets.

Their target selection systems are still based on products. Just the 3% answered that they are customer focused.

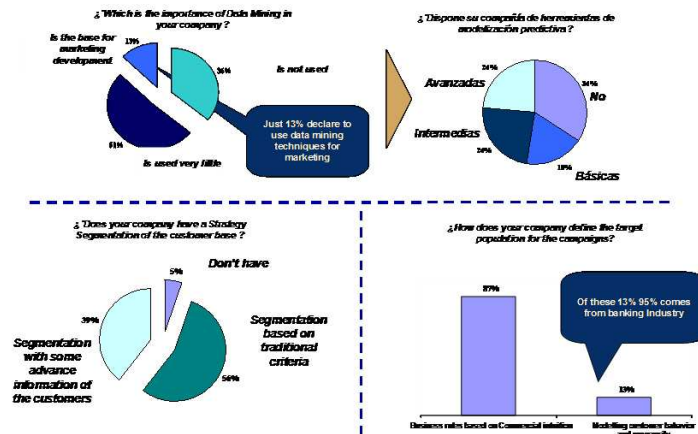
Related to customer intelligence, the answers were:



In my point of view, the market conjuncture and the survey results prove that this trend is unstoppable

Advanced customer management is turning itself into an essential element in order to outline and receive continued growth in income.

Banking has historically been the industry that starts more impressive transformations in the world of business than any other. It is not different in this occasion. The banking sector is on a total revolution in reference to its own redefinitions of the commercial strategies of approach and customer management; and they have already been followed by other sectors such as telecommunications, the hotel industry, utilities, etc.



The advantages are obvious; the only requirement is an understanding of the underlying analytical techniques, and the conviction and implication of the whole company for change.

The first model to think about in order to define advanced customer management is, from my point of view, a strategic customer segmentation that allows the setting of commercial strategies attending to customer profiles instead of the company products catalog.

It is an almost definite fact that all financial entities currently have customer segmentation, but these are defined by traditional parameters such as activity or type of client (individual or company). The information that is currently known about customers allows inferring behaviors or values that are important in defining an advanced customer management strategy. This is the case in their income level or their potential value.

The next pages detail the methodology used to calculate the values and the business applications underlying segmentation.

## 2 Practical Case: Strategic Customer Segmentation

The segmentation proposed is compounded for magnitudes such as age, rent level, potential value, and customer connection.

These magnitudes clearly define the reasons for specialized commercial strategy.

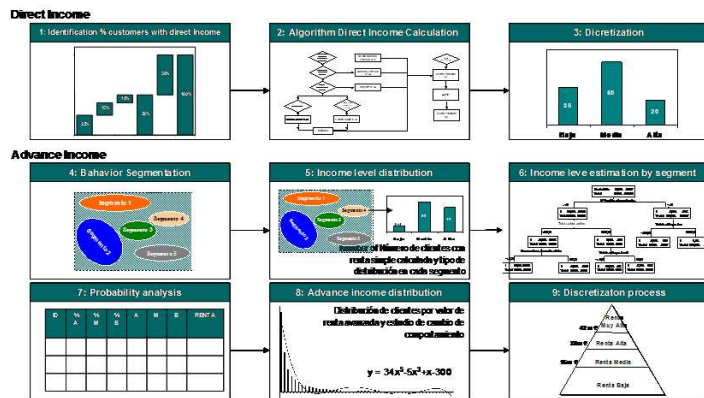
- Age: there is no doubt that age conditions different behaviors or attitudes in customers.
- Income level: the customer's income level is, in banks, one of the main parameters used to define a customer profile and what they are expecting to receive from the entity.
- Customer value: understood that future expected fluxes of profitability, incomes, etc., it fixes the investment for each type of customer.

- Client connection: this links the customer relationship and loyalty level with the entity.

We are now going to show in detail the methodological process to calculate the income level and the potential value of the previous parameters.

### Income Level

The procedure to calculate a customer’s income level has several steps:



a. - Direct Income Calculation:

There are a certain percentage of customers for whom the income calculation is obtained directly from derived transformations of other variable values. For example, payroll or pension, recurring incomes, etc. . . . On average, in the Spanish Banking Sector is able to calculate income level by this process for 40% of the population.

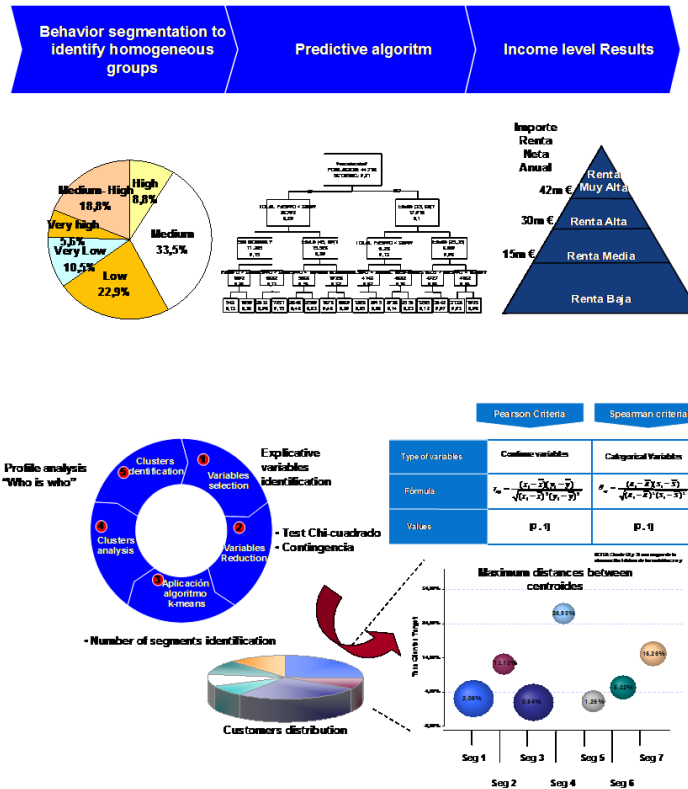
b. - Advance Income Estimation:

For the other 60% of the population, the income calculation is obtained by statistical inference. They assign to each customer, whose rent is unknown, the same rent interval of those others with which the distance in behavioral terms is lowest.

This is calculated with the following:

b.1. - Behavioral clustering:

By vote algorithm (condorcet) or a distance-based algorithm (mainly k-means), we are able to identify, through an iterative procedure defined in five steps, customer segments with similar behavioral. This previous step is essential in order to set a predictive algorithm to assign each customer a winning probability of having a certain income level.



b.2. - Forecasting classification

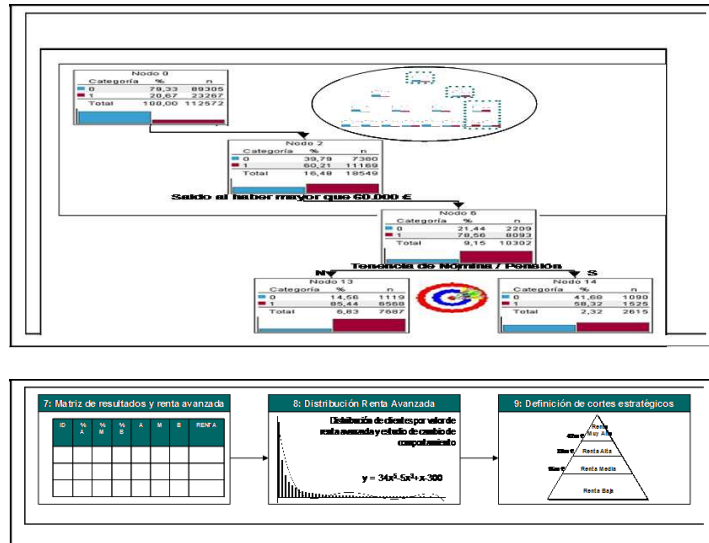
For each of the identified segments and desired levels of income forecast (i.e. low, medium, high), a forecasting algorithm is created (i.e. Chaid, RRNN) that will determine the probability that a customer belongs to each of the categories.

*Customer niches are identified with high probabilities of belonging to a specific group.*

b.3. - Distribution and transformation analysis

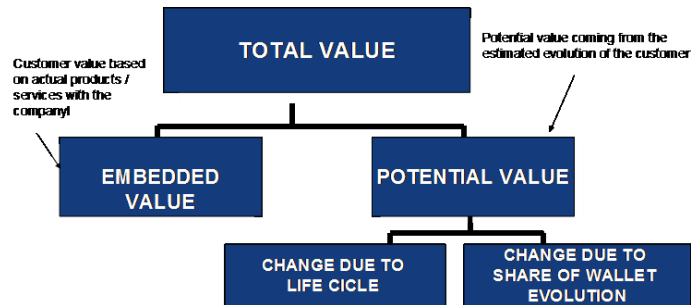
Once the probability of belonging to each level of income for each customer is calculated, a comparison of the income distribution over the population will be performed. This income will be calculated with direct methods, whose final value has been forecasted by data mining.

Using classification and weighting criteria, we are finally able to assign to each customer the 'income band' of major probability.



### Customer value calculation

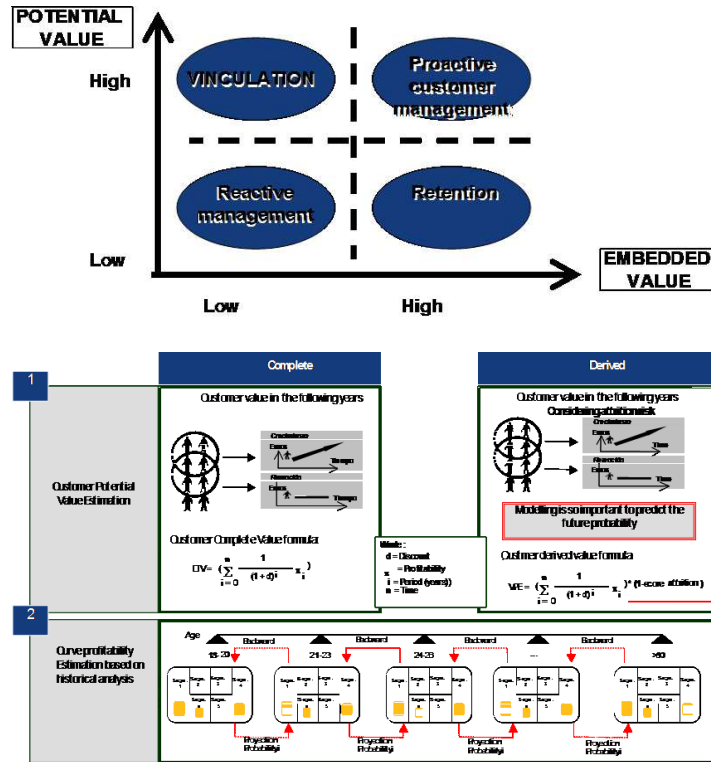
The methodological procedure of the customer value calculation is developed by taking into account the present positioning of each customer and the future projections derived of the potential increase.



From a strategic point of view, the breakdown of the total customer value into the present and potential value will allow the definition of differential commercial strategies.

There are two variants in the potential value calculation: complete and derived, understanding that derived is the value of the customer, also considering the possible risk of attrition.





Each customer’s micro segment, the evolution of profitability curves, should be evaluated in a quantitative way. They should be inferred based on the evolution of a customer’s collective, which in the past had a similar behavior to them in the present moment. In this sense it is necessary the use of clustering algorithms as well as Markov streams, due to the probability that each status is conditioned by the previous one.

### Conclusions of the strategic segmentation

Strategic segmentation is, as we have seen, the starting point for the definition of an advanced customer management strategy.

We have proven with this example how data mining techniques allow for the calculation of advanced customer information, which supports a more specialized decision, and, therefore, more efficient business management. It is considered as the most necessary driver to improve business efficiency and obtaining a continuous income increase.