THE BORDER BETWEEN BUSINESS INTELLIGENCE AND PSYCHOLOGY- SEGMENTATION BASED ON CUSTOMER BEHAVIOR

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Abstract:
In today's economy, marketers have been facing two challenging trends: fierce competition between companies offering essentially similar products, and dealing with customers that are increasingly informed and demanding, but less and less loyal. Under these conditions, it has become imperative for managers and for marketing professionals to invest in business intelligence in order to find patterns in the consumers' behavior that could predict their future buying decisions. In this report we have presented how Decision Support Systems, data analysis and customer segmentation can help companies to know their customers better in order to predict (and influence) their future actions. At the same time, we have argued that Business Intelligence should meet psychology and neurology halfway, and accept that there is a very high emotional subconscious component that produces a high degree of unpredictability in consumers' behavior.

Keywords: DSS, business intelligence, consumer behavior, segmentation, buying decision process

Introduction

Mass marketing via mass media typically produces relatively low returns (response rates less than 1%), if they're measured at all. Many firms have turned to targeted marketing to increase response rates. As the level of marketing sophistication and "science" increases in the marketing process, response rates can rise dramatically. Simple product marketing with basic demographic information can increase response rates from 3% to 4%. Segment-driven marketing based on customer value can help target high-value customers, but doesn't increase effectiveness tremendously. Needs-based marketing involving the customer life stage and lifestyle can improve response rates up to 20% or better. Customer-driven marketing based on events triggered by customer interactions/transactions can improve response rates up to 30% or more.

Customer segmentation has moved through numerous phases categorized into three general approaches.

Product-based - This approach segments customers according to what they're buying.

Value-Based - In recent years, enterprises have increasingly focused on growing their understanding of customer profitability, enabling the creation of customer value-based segments such as "gold" and "platinum", or high-net-worth individuals. This approach segments customers according to who is buying.

Needs-Based - This is driving growing interest in segments based on customer needs, effectively creating

segments based on why customers buy certain products.

From a needs-based point of view, companies spend millions every year to research consumers' preferences and buying intentions and, based on research results, they spend other millions to develop new products, launch special offers or open new sales outlets. And, more and more often, the new products or special offers end in failure – marketing studies have shown that 80% of all new products and services fail within 6 months or bring much lower sales than the anticipated profit (Zaltman, 2007, p.29). Why didn't the consumers buy the product about which they had said in a focus group that they would buy it if it existed? What is influencing and determining people's buying behavior? Is the buying decision process 100% rational, as we would like to think because we wish to be able to explain and predict it? Do managers have to understand not only the dynamics of clients' conscious cognitive process, but also and especially the unconscious one? (Zaltman, 2007, p.31)

To deepen the concepts behind the customer behavior and segmentation the intrinsic link between the temporal evolution of the marketing and information systems must be emphasized.

Decision Support Systems

In the process of finding solutions and taking decisions that will lead in a reasonable manner to proper results, the first place consists of the searching process based on strategies put into work in the voluntary selective attention that involve restricting the "search area", as the evolving of the appropriate development of searching process. Management decision is the choice of action for one or more goals.

R.T. Clemen remarks that the decision context is the framework of events that determine the set of objectives that actually matters (and nothing more or less) for a decider at the time of drafting the decision, even if the values remain relatively unchanged (Clemen, 1996).

Even if some simple patterns could be achieved based on generic or structured data, a depth and systematic analysis that involves semi-structured or unstructured data could show more complex patterns and trends that involve using of a specific class of information systems – Decision Support Systems (DSS), systems for collecting and analyzing the information in order to assist managerial decision.

The objective of a DSS is to minimize the effects of the limitations and constraints in solving of a large and complex area of decisional problems by implementing automatic processes of decision support (Filip, 2004, p.5).

It is important to notice that even if the decision support systems have an important role in the processes of decision the manager should initiate the process by choosing the appropriate set of questions, only in this way problems are identified and resolved.

Business intelligence is a term used to describe an integrated set of methods, applications and processes used to capture, collect, integrate and analyze data to present information used for management decision; is referring to modern data driven decision support systems using leading edge information technology like data warehouse or data mart, ETL-extract, transform and load tools, data query and analysis tools, data presentation and visualization tools.

From a historical perspective P. Keen and S. Morton allege that the concept of decision support systems evolved from the theoretical studies of organizational decision making done at the Carnegie Institute of Technology during the late 1950s and early'60s and the technical work on interactive computer systems, mainly carried out at the Massachusetts Institute of

Technology in the 1960s (Keen and Morton, 1978).

O'Brien defines DSS as those IT systems which are based on the use of analytical models, specialized databases, judgment and intuition of the decider and a process of interactive modeling which supports the semi-structured or unstructured decisions took by managers (O'Brien, 2004). The main objective of the decision support systems is to improve modalities for the decision adoption or creating a preparatory study for taking the best decision where the activities to be developed for this purpose are not programmable.

Howard Dresner notice the fundamental importance of a business intelligence system: Doing business is information-intensive. Enterprises are being pushed to share information with increasingly more audiences. The business intelligence imperative insists we elevate BI to a strategic initiative now, or risk disaster! (Dresner, 2001)

The dichotomy between transactional systems and business intelligence systems is shown by the data types existing in such systems. While the transactional systems load current transactions and keep a relative small log, a data warehouse works with large volumes of historical data which are then summarized.

The architecture of a business intelligence framework involves two environments: data warehouse itself and analysis component.

Data is extracted from the source system using extract, transform and load tools. It is loaded into a Staging intermediary database, to allow transformations to be performed before all the detail data is loaded into the Data Warehouse (DW).

The Data Warehouse Database holds all the detailed information in the system.

Analysis components of a data warehouse system are used to support tactical or strategically decisions by performing data retrieval, data analysis and data mining.

Analytical Environment – A Customer Centric Approach

In the past, the individual customer was not important but in the recent year's customer retention become one of the highest priorities in any organization strategy. To become customer-centric, organizations must use analysis and segmentation of customer groups to allow a better targeting in order to assure a better marketing campaign.

Customer segmentation is the process of dividing customers into distinct subsets (segments or clusters) that behave in the same way or have similar needs. Because each segment is fairly homogeneous in their behavior and needs, they are likely to respond similarly to a given marketing strategy. In the marketing literature, market segmentation approaches have often been used to divide customers into groups in order to implement different strategies (Yinghui Yang, 2009, p.140).

Customer segmentation schemes must be useful - information can be collected to determine which customers fit into different segments so that action plans can be developed and effective-customers within a segment must behave in similar and predictable ways. Segments must have clearly understandable and different needs that can be acted upon.

The actual trend is to consider customers as individuals and emphasizes the importance of understanding and leveraging customer-level data providing the possibility of segmentation and profiling of customers to improve target-marketing efforts, thus obtaining a comprehensive view that shows the customer relationships with the organization.

Nowadays, massive amount of data is being collected for customers reflecting their behavioral patterns, so

the practice of analyzing such data to identify behavioral patterns and using the patterns discovered to facilitate decision making is becoming more and more popular (Yinghui Yang, 2009, p.143).

For strategically and tactical analysis the analytical environment as part of the business intelligence framework is based on three types of analysis: report, analyze and predict.

Analysis and Reporting can be done by the following applications: a) classical reporting applications are applications that involve static reports. These kinds of applications that have minimal analytical requirements are based on relational databases and use SQL language;

b) ad-hoc query and reporting applications offer to the end users a high level of interactivity by using the techniques of navigation and selection of data;

c) analytical applications (multidimensional) can answer to more complex questions other than those for ad-hoc reporting and are based on multidimensional techniques;
d) applications for extraction and planning (data mining) - are designed in such a manner so the end users can discover new patterns based on historical data stored in the database.

Because they are based on historical data, structured into the data warehouse framework and supporting customer analysis and segmentation, business intelligence tools and methods could indicate trends based on customer behavior with results in better targeting during marketing campaigns increasing the profitability and revenue.

Organizations will increasingly need to use analytical techniques for segmentation to support broader marketing, sales and service initiatives at the customer level.

Segmentation based on customer behavior – the psychological approach

As presented above, predicting consumer behavior based on current patterns is one of the main objectives of Business Intelligence. Consumer behavior can be defined as a multidimensional concept par excellence, representing all the decisional acts made by individuals or by groups, directly related to acquiring and using goods and services to meet their current and future needs, including the decision-making processes that precede and determine these acts. (Catoiu and Teodorescu, 2004, p.15)

The consumer behavior theory tells us that, in the mind of the consumer, a decision-making rational and conscious process unfolds, which has several stages that follow each other in a linear fashion and derive from one another: (Catoiu and Teodorescu, 2004, p.34):

1. emergence of an unmet need raising the consumers' awareness;
2. establishing alternatives based on information about the nature of the product and consumer characteristics, obtained by internal and external search;
3. mental evaluation of alternatives;
4. determining the evaluation resultant (the decision to purchase);
5. post-purchase evaluation.

From the cognitive-procedural perspective, thinking is the intellectual activity for logic-criteria processing of the information provided by perception or memory, for understanding, explaining and interpreting the phenomena of the universe (nature and society), to solve different types of problematic situations, development of various projects and plans for creative activity, the development and adoption of decisions best action (Golu, 2000).

However, the latest neurological research has found that people do not think in a linear, fragmented,

hierarchical way, but always view the final product as a whole. When consumers evaluate a product, they use a complex system, composed of mind, brain, body and outer world, which influence one another in a fluid and dynamic way (Zaltman, 2007, p.41). Buyers do not think in separate compartments, as companies and universities are organized. In order to truly understand consumers we can not "dismantle" them and study them by pieces and we must not focus solely on one of the four aspects, but on the interaction between them. Renowned companies such as Citibank, Kraft, Coca-Cola, Unilever, Hallmark and Disney are beginning to base their research on areas that previously were not considered to belong to the field of marketing, such as musicology, neurology and philosophy, besides those considered tangential to marketing, such as psychology, sociology or anthropology. More and more research studies, even those made by proponents of rational thinking, have revealed that the rational model of explaining consumers' decision making process is more an exception than a rule. It seems that the selection process is relatively automatic and is based on the skills and other strengths of the unconscious, being largely influenced by the social and physical context of the consumer. (Zaltman, 2007, p.36).

Although the human brain has separate modules for processing emotions and supporting logical reasoning, the two systems communicate with each other and influence our behavior in tandem. The emotional system, which is older than the rational one from an evolutionary perspective, typically exerts the first influence upon our thinking and behavior. More important is the fact that emotions contribute to and play a key role in making correct decisions. (Zaltman, 2007, p.36) Recent studies on the effects of brain injuries have demonstrated that when the neurological structures that have a role either in the appearance of emotions or in supporting reasoning suffer injuries, the affected individuals lose their ability to make the right decisions that enable them to live a normal life. (Zaltman, 2007, p.37)

From neurological studies, we also find out that generally people do not think in words. For example, EEG scans demonstrate that the activation of the connections between our nerve cells (neurons) precedes the moment we are aware of a thought, as well as the activity of brain areas involving verbal language. These neural areas are activated only later, after the person in question has chosen to represent the unconscious thoughts to themselves or others using verbal language (Zaltman, 2007, p.44).

Also, marketers overestimate the power of advertising communication, assuming that when consumers are faced with information about a brand or with stories about a company, they receive these messages passively and in the exact form they were transmitted. On the contrary, studies show that consumers create their own meaning, combining the information provided by companies with their own memories, with other stimuli present at those moments and with the metaphors that are evoked in their mind when they think about the message of that company (Zaltman, 2007, p.45).

Furthermore, human memory is much more creative and more flexible than we imagine, permanently combining and recreating memories, so that marketers cannot rely on the assumption that the experience that a buyer remembers today is the same as the experience that he will remember in a few weeks. For example, a large European retailer discovered that the experience described by people answering a questionnaire was different depending on the order in which questions were addressed and even depending on the color of the paper

they were printed on (Zaltman, 2007, p. 43).

Another important note is that despite what marketers think, consumers have limited access to their own mental activities. 90% of thought processes take place on the unconscious level, and instead of guiding or controlling our behavior, the conscious mental activity rather seems to explain the behavior after it has occurred. (Zaltman, 2007, p.39) An example would be that of a producer of chemicals who could not understand why some companies were willing to pay other suppliers a higher price for similar products. The first reasons invoked by the buyers were traditional and logic, such as the desire to not rely on a single supplier. However, a closer analysis revealed a much more important feeling - self-esteem - which appeared among procurement agents. The company managed afterwards to strengthen the relationship with the procurement agents by adjusting the feeling of recognition of self-esteem during sales calls (Zaltman, 2007, p.40).

The neurology and psychology facts summarized above indicate that the decision making process in consumer behavior is determined more by unconscious thoughts and feelings than by conscious ones, although conscious thoughts and feelings are, of course, very important. But the unconscious forces, such as memories, images or feelings, influence decisions and behavior more clearly and are in perpetual change and interaction (Zaltman, 2007, p.46).

Conclusions

Business intelligence, component of DSS systems, has become integral to day-to-day operations, propelling the technology into mission-critical status. At the same time, a number of factors have increased the complexity and changes of business environments. The global business requirements reveal the need for many unique and interlinked key business attributes based on main criteria's like relevance, impact and feasibility. Organizations must adopt an enhanced, integrated and flexible business intelligence enterprise model that considers various business, functional and operational requirements and linkage between all the data warehouse components. However, decision support systems aiming to predict consumer behavior should not leave out the psychological aspect. No matter how close consumers are to a brand or a company, no matter how often professional research studies are conducted, no matter how many loyalty systems or promotional actions get implemented, customer behavior may at any time surprises marketers and it is the task of business intelligence to take into account this element of unpredictability and minimize its effects when designing marketing programs.

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