DATA MINING PPV AN APPLIED DEEP LEANING NEUROMARKETING TOOL TO THE PERFORMANCE OF THE POINT OF SALE PROMOTION: A QUANTITATIVE STUDY

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ABSTRACT

The Data Mining Promotion Point of Sale application algorithm is an online digital marketing application, user friendly, economical, interactive, and ecological, capable of transforming "data" in real-time into "knowledge" to allow marketeers to make agile decisions. To respond to the current challenges of the Point of Sale (PPV), Pereira, P. and Magalhães, M. (2019) developed a Deep Learning solution that incorporates Neuromarketing which allows the making of Promotion campaigns at the Points of Sale (PPV) more effective. Through the Data Mining PPV system, the manager of a point of sale will be able to answer the following questions: What is the profile and time of the Consumers who enter the Store? Who are those who see advertising campaigns? How many advertising campaigns were run and attracted Consumers? Can you quantify the time when "impulse sales" were made by consumer profiles resulting from the visualization of the "advertising campaigns" shown? As a methodology we use a Data Mining PPV application implemented in 20 convenience stores, in a company that produces and sells fuels, having its own network, with more than 200 service stations for fuel supply, where there is also, in each station, a convenience store. As a result of the test carried out during 234 calendar days, in 20 convenience stores, with the Data Mining PPV application, it allowed the marketeer to collect and process data in real-time. During the period in question, 3,276,000 visits were recorded and collected through a screen placed above the cashier's location. We saw an increase in "impulse sales" of around 30%, allowing us to display the right "ad", at the exact "time", for the right "persona", allowing us to monitor in dashboards the effectiveness and efficiency of advertising campaigns carried out by a point in terms of volume and sales value. Regarding the limitations of the study, we can mention that this study focuses on a company that produces and sells fuels, with the sole purpose of observing, analyzing, and winning over its customers in its convenience stores. As for originality and value, we can record the use of a sample relevant to the study in question and an efficient and current method to collect and process data in real-time, increasing sales significantly.

Keywords: Deep Learning, Neuromarketing, Research, Promotion at the Point of Sale (PPV), Consumer Behavior, Point of Sale in Real-Time.

INTRODUCTION

Today, it is easy to see the increasing limitations of a physical promotion campaign, either by adapting it in real-time to different targets (digital natives) or by logistics: layout, printing the exhibition space of the different campaigns. But even so, if this were feasible, it would result in very high economic and environmental costs. The world today is virtual, in the future it will be even more virtual and, therefore, it is necessary to know how to live virtually. Therefore, marketers will increasingly need agile frameworks, which will allow them to guide marketing actions and, make decisions in real-time, which will increase the effectiveness of Point of Sale (PPV) Promotion campaigns. Therefore, it is easy to understand the importance that the digitalization of businesses takes on today, to allow the increase of sales on impulse at the Point of Sale. Hence, given this speed of change, there is a need for frameworks that allow real-time promotion campaigns to be presented one-to-one to the desired target and capable of monitoring the performance obtained through dashboards. Data Mining PPV, is an application that allows marketers to draw anonymous profiles, by gender, age, date, and time of the visit to the point of sale, without the need to capture any image of consumers, in compliance with data protection and privacy legislation, Regulation (EU) 2016/679 which came into force on May 25, 2018 (GDPR) and Law No. 58/2019).

Of course, there have always been different ways to question the consumer. From the most conventional, face-to-face interviews to online surveys. But, what happens in this type of methodologies or approaches, the interviewees tend to respond in a *"politically correct"* way. That is, they give socially desirable responses. They hide behind screens. They do not let you assess their true opinion about your buying behavior! Besides, in the pandemic climate we live in, detachment is a recommended practice for the protection of health and hygiene of personas to reduce the spread of COVID-19.

Today, increasing *"impulse sales"* is crucial for organizations. As it is, marketers must be able to influence personas when making a purchase decision. Thus, it is essential to have reliable information on consumer behavior at the point of sale, so that it is possible to design impactful campaigns.

With the market becoming increasingly fierce, it is difficult to establish competitive advantages. This is because most of the companies continue to follow the same methods as for delivering their value proposition; consequently, to use the same practices and reap the usual results (Crescitelli, 2004). The need to get closer to the consumer becomes even more relevant to understand him and, thus, devise more assertive strategies. Empathy, putting yourself in the other's place; living the other's *"pain"*; comes to make even more sense for generating ideas/insights (Brown, 2013; Norman, 2004).

Generally speaking, all human beings believe that they are unique and that they need to be seen as such. The fact is that the search for mapping and understanding such patterns becomes a complex task given the constant transformations/stimuli presented in daily life (Poon & Prendergast, 2006). Because of the referred context, some recent studies until now under the domain of neuroscience have contributed to the achievement of notable interventions in neuromarketing; concerning, they are the works of Barrett et al. (2016); Eysenck & Brysbaert (2018); Kolb & Whishaw (2009).

Neuromarketing is understood as the use of neuroscience experiments with marketing. The purpose is to obtain new ideas for the development of products that can be better adapted to the needs and desires of consumers. Unlike marketing that traditionally seeks and extracts information through conventional research; focus groups, ethnography, and others,

neuromarketing works in search of understanding the subconscious, mapping brain stimuli (Plassmann et al., 2015; Schwarzkopf, 2015; Yoon et al., 2012).

Understanding consumer behavior at the physical point of sale is crucial for any business area. It is imperative to have a perception of how decisions are made at the point of sale by the consumer, whether they are companies that have only one physical presence, or have chosen to digitize their business or pursue an omnichannel strategy. Whichever business model you choose, answer the following questions: What is the pattern of the personas who visit us? How do they make their decisions to purchase products and services at the point of sale? It will always be a critical factor for a marketeer's decision making.

LITERATURE REVIEW

Nowadays, it is not enough to just have consumers' perceptions of their opinion about the location and design of the store space. It is essential to know the promotional campaigns that each persona wants to view the ones that increase impulse sales. On the other hand, there are several ways that a marketeer can collect this information. However, conventional measures, such as face-to-face surveys and online questionnaires, produce data that are subject to conscious manipulation and prejudice from the consumer's unconscious. The problem lies with the interviewed personas. They tend to provide socially desirable responses and this naturally affects the quality of the data and limits the effectiveness of the resulting commercial actions. On the other hand, the signals collected through the *"unconscious brain"*, and other neuroscientific measures, allow to influence decision making and are less susceptible to manipulation or prejudice, according to Knutson et al. (2007); Berns & Moore (2012); Falk et al. (2012) allowing us to investigate authentic personas behavior without interrupting consumers 'journey, Briesemeister (2016). Therefore, neuroscience can aggregate valuable insights into consumer motivation and satisfaction, in addition to conventional measures. In this context, a deep learning application was developed, called Data Mining PPV, which integrates artificial intelligence that allows real-time persona to persona customized promotional campaigns that will allow you to increase sales on impulse and become an agile framework for marketers. Undoubtedly a tool to support the Canvas Marketing Plan: How to Structure a Marketing Plan with Interactive Value? (Magalhães et al., 2020). In addition to the features mentioned, this framework will enable marketeers to customize persona to persona promotional campaigns, in addition to being a source of additional revenue for the sale of advertising space at the point of sale. With what argument? Sell advertising personalized to the taste and desire of each persona.

Tests of Neuroscientific Methods

One of the most well-known phrases in marketing is attributed to Wanamaker J., 1920, to a marketer from the beginning of the 20th century, in which he says, *"half of the money spent on advertising is wasted, and the problem is that I don't know which half"*. This phrase spurred a new era in marketing research, in the sense of better understanding the consumer, allying with the science of human behavior, psychology, and neuroscience, where an attempt was made to obtain an answer to the question of Wanamaker J., trying to reduce the investment in marketing and communication in the sale of products. However, in this sentence, we are faced with a mixture of areas of knowledge in a way that makes sense together, that is, to apply scientific areas to concepts of practical action, to what was called Intelligence Consumer Neuroscience, (Rodrigues et al., 2015).

Applied neuroscience, despite being a relatively recent field of study, shows that its evolution has occurred at an exponential rate since 2007, where companies specialized in neuromarketing has proliferated all over the world. The application of neuroscientific methods, such as electroencephalography (EEG) and eye-tracking, started to help and obtain information on consumer behavior. Google searches have increased dramatically, publications have multiplied, Plassmann et al., 2012, Microsoft and Daimler are already integrating neuroscientific research with great success (Sahu & Singh, 2013).

It starts to be easy to understand why many companies apply neuroscientific research to increase their business. An example of this is the work carried out by the Deloitte Neuroscience Institute which carried out two tests for an electronics retailer. First, it analyzed the impact of a store's redesign on sales, and second, it calculated the increase in sales motivated by the launch of a price promotion campaign. In these tests, it was possible to identify which measures were the most successful in sales. As well as, which were the most successful promotional campaigns. Also, it made it possible to assess which measures were implemented, resulting in greater consumer satisfaction. Through these tests, this retailer can, consequently, improve the design of its store chain and adjust the pricing strategy according to the consumers' *"unconscious preferences"*.

From here, we can draw some strategic guidelines that have helped to improve the consumer experience. Likewise, other organizations have adopted the same practices. This was the case with Mercedes-Benz, where a strategy to improve the consumer experience that would match its legendary vehicles was redefined (Michelli, 2017). It is not enough to have luxury cars, innovation, performance, and quality in vehicles if the consumer is not at the center of the company, in this way, the enchantment will never be achieved. This means it is increasingly important to map the consumer's journey, identify the *"real moments of the business"*, as well as assess the consumer's perception quickly so that one can provide exceptional experiences. The consumer experience is influenced by several interactions and moments of truth. We know in a *"matter of seconds"* that a customer is won or lost (Carlzon, 2012).

Let us resume the test carried out at the retail store of electronic products. Typical moments of truth are the store layout, which includes design, product location, digital screens, static advertising, and merchandising options, among others. Until now, the store's design options and the justification for greater or lesser investment were decided by marketers based on the sales budget, and promotion campaigns were defined without any supporting data that could credit the sales potential and ROI expected.

Today, neuroscience makes it possible to evaluate and quantify the perception of moments of truth and makes it possible to make decisions based on tangible numbers. There are solutions on the market that integrate neuroscience applications that provide companies with insights on how to define marketing strategies that will achieve economically viable sales and place the consumer at the center of the organization. Besides, there are frameworks, such as SAFe 5.0, which in its latest version, the consumer becomes the central figure in the process of formulating and executing the strategy, incorporating practices and tools that will allow the design of solutions each time more customized to the needs of customers (Knaster & Leffingwell, 2018).

Namely, the Deloitte Neuroscience Institute can observe and quantify the perception of moments of truth in the essays it conducts, using neuroscientific methods to identify positive and negative emotions through the eyes of consumers. The tests carried out can accurately predict what will be the behavior of consumers concerning the launch of a new promotional campaign,

allow minimizing the problematic aspects that affect the business, provide adjustment suggestions about the positioning strategy, maximize customer satisfaction on their journey, and generate an increase in the Value Delivered by companies to consumers.

At the electronics retail store, marketers' choice of a video game exhibition site can be problematic. The video game may be displayed in shelf space in conjunction with other competing games, or it may be in a prominent place, or it may have associated a promotional campaign with the cashier or on several screens distributed by the store. The Deloitte Neuroscience Institute made neuroscientific measurements to investigate the following aspects: what is the degree of implicit attractiveness of video games in-store and the way consumers choose a video game (whether by brand, features, or size, ...).

The tests were carried out during normal business hours, to simulate a shopping experience. The selected consumer group was induced to purchase products by pre-selected categories according to a shopping list provided. The list included categories of video games that were distributed in different places within the store. The Eye Tracking equipment used by consumers allowed them to enjoy a comfortable and natural shopping experience. The equipment made it possible to measure consumers' eye movements and focus points, identifying the ways of looking and areas of interest. In this study, the eye-tracking equipment is similar to a pair of glasses and allowed consumers to move freely while wearing the device.

The main conclusions drawn here were that the implicit attractiveness of products displayed in stores was perceived differently. Interestingly, most of the purchase decisions took place on a digital screen next to the cashier, where campaigns promoting various products are presented, even though video games have not had a very positive reception. In most cases, the implied attractiveness of the screens has led to the following recommendations:

Invest and optimize on the screen with the cashier. It was the most important place in the purchase decision with the largest impulse purchases. Besides, it is also suggested to place several advertising displays inside the store, because it had different impacts on the perception and attractiveness of the purchase of products. For example, the exhibitors placed at the entrance of the store were perceived differently from those located in the check-out area. Therefore, it was demonstrated that the place where the exhibitors are placed is important in the consumers' shopping path. And these will be more or less receptive to the purchase decision, depending on where they are. In this sense, it is also certain that the purchase decision making is less rational than marketers can imagine (Kahneman & Tversky, 1979). To this end, the methods used by neurosciences can help to detect consumer preferences and what will be their reactions to the promotion of a price on a given product. Therefore, identifying which price promotions will work best is an essential mission for any business.

In this sense, price promotions are a way of communicating prices that are generally based on a discount for a particular product or service. Although each approach is unique, price promotions generally aim to attract more customers, increase sales, generate higher revenues, and obtain greater stock rotation.

In the test carried out by the Deloitte Neuroscience Institute in the retail store of electronic products, different price simulations were carried out to measure the explicit and implicit (unconscious) motivation in the purchase of a product. The objective was to identify which promotion campaign would most attract consumers and maximize profit. It was to be expected that more rational consumers would be more sensitive to campaigns to promote lower prices. However, electroencephalography (EEG) measurements performed reveal that the implicit pre-disposition to pay much less for a product deviates from the rational. Hence, it was

concluded that the choice of a promotion campaign with the best implicit perception is not necessarily the one with the lowest price.

So what is the ideal price for a promotion campaign? This results in numerous advantages in using neuroscientific insights because they will allow us to identify when a product fits or not in the concept of crowd intelligence. In this specific case, price sensitivity is lower, because consumers tend to buy products that are more familiar to them. The popularity provides the products with a social validation for the purchasing appetite. Many consumers conclude that a product is good because many people buy it. In this context, neuroscience makes an important contribution to identifying the psychological price at which a promotional campaign should be created and creating an excellent shopping experience, Wu & Lee (2016), Journal of Retailing. Although many marketers tend to find it easier to segment consumers by class, when using ERPs and CRMs, to handle the available data about consumers. These end up being the supporting elements for making sales forecasts and making adjustments to the commercial strategy.

Despite today, this way of thinking is manifestly insufficient to guarantee the sustainability of an organization's commercial strategy, taking this into account; it has to decipher the consumer's mind. However, even though it is not an automated tool, one can use complementary frameworks, such as the empathy map that presents itself as a good commercial segmentation tool. Hence, to ensure an intelligent and efficient vision, the Deloitte Neuroscience Institute has helped organizations to segment consumers based on psychological analysis. In contrast to the conventional segmentation of customers, which focuses only on observable buying behavior, segmentation with a psychological basis allows us to understand the motivations underlying consumers for making a purchase decision. It should be noted that this type of solution is more suitable for retail stores where impulse purchases require greater attention from marketers when carrying out strategic and operational planning. When considering different types of motivation, marketers can identify different reasons and patterns of purchase and improve their business in general.

The psychological types provided by Bischof & Bischof-Köhler (2013) were measured inside the retail store of electronic products through a standardized questionnaire. The results were correlated with the purchase behavior and the implicit perception of the product measured by EEG. Purchasing consumers were found to differ significantly from non-buyers in terms of their implicit purchase motivations. The screen that had the greatest impact on purchases was the one that is located near the checkout counter, although many consumers had previously seen several video game displays during the journey in the store.

In short, as a result of the emergence of neurology applied to consumption and marketing, it allowed us to predict the best way in which the human brain creates neural networks that will allow associations to a brand/product and build positioning in the consumer's mind. Likewise, brain analyzes are also very useful for identifying market segments that respond in the same way to a given stimulus. Another fundamental variable in any organization, however small, is the price variable since it has a direct impact on profits and the economy. Through neuroscience techniques, it is possible to determine, with great precision, the levels of too low and too high prices, allowing practicing the most profitable price possible of the optimal price limit. Also, the price has a great influence on the perception of the quality of the products, causing different responses in the consumer's brain. And the predisposition to pay a certain price? It is also proven that neuromarketing methods have a much more effective ability to predict these behaviors than traditional means of market research.

Data mining PPV test

The concept of priming effect is an implicit memory effect, in which the presence of a stimulus influences the response to another stimulus, Rodrigues (2013), that is, it consists of a species of *"marking"* in memory, which may occur, either in the presence of a perceptual, semantic or conceptual stimulus. Braidot (2009) states that

"by reading the brain waves of consumers exposed to the same stimulus, it can be proved whether or not there is a direct relationship between what they think about the product, the brand or the price, and what they think is the result of the construction and linking of different images in the brain that determine the position".

In this context, Braidot affirms that it is the brain characteristics that define the positioning for a given product, brand, or price, therefore, one must study which are the most appropriate stimuli to transmit to the consumer the desired objective to reach the ideal place in the mind of this, to favor associations and memories to increase impulse sales at the point of sale.

For this purpose, the Data Mining PPV algorithm is a system that "learns", integrates into itself, artificial intelligence that allows adjusting the concept of priming with the brand positioning and the price of the product, and will allow, in real-time, to present consumer to consumer the promotional campaign that he expects to see, thus allowing to increase sales on impulse. It is a digital application, agile and different from the other applications that exist on the market. And it is undoubtedly a tool to support decision making so that marketers can achieve a higher ROI on the investment to be made in sales promotion.

Many other dashboards will be possible to define taking into account the needs of each marketeer, making this application a tool that allows neuron segmentation, *"more than investigating brain patterns that identify consumers with brands and products, it is necessary to identify which individuals are willing to pay"*, Chib et al. (2009). The marketeer will have its own autonomy; it can adjust this digital and interactive framework to the digital communication strategy, without relevant costs, allowing it to elaborate by ranking the number of promotion campaigns viewed by consumer pattern, the respective viewing time and evaluate the value of sales obtained on impulse in the products and services promoted. The features obtained when using the Data Mining PPV application will allow the marketeer to evaluate in real-time the ROI of the dynamic playlist of the promotional campaigns viewed by consumers given the sales made. That is, you will get a global or neuro-segmented PPV conversion rate.

PPV Conversion Rate

$$PPV\ conversion\ rate\ = \frac{impulse\ sales}{Promotion\ campaigns\ viewed}$$

Besides, this digital framework facilitates the store clerk's work in promoting and selling products and services to consumers, given that the programming of the Data Mining PPV algorithm through artificial intelligence will help you to close deals. Also, the Data Mining PPV system can be an appreciable source of revenue for the sale of advertising space at the point of sale to regular, potential, or other suppliers. With what argument? We will be able to involve and prove to the investors in advertising space the ROI obtained and the PPV conversion rate.

METHODOLOGY

The pilot test carried out with Data Mining PPV application was implemented in 20 convenience stores, in a company that produces and sells fuels, having its own network, with more than 200 service stations for fuel supply, where it also exists, in each station, a convenience store. The challenge facing the company marketeer was to increase impulse sales by 20%. Besides, I wanted to learn more about the types of consumers who visited each of the points of sale, what was the peak hour of the business and what were the promotional campaigns that had the greatest impact on the purchase stimulus.

As a result of the test carried out during 234 calendar days, in 20 convenience stores, with the Data Mining PPV application, it allowed the marketeer to collect and process data in real-time. During the period in question, 3,276,000 visits were recorded, collected through a screen placed above the cashier's location. The application performs facial recognition, in real-time, through an HP HD 4310 camera that incorporates the screen where promotional campaigns are displayed, without the system storing the consumer's image on the server, thus respecting the legislation of General Data Protection Regulation (GDPR) and Law No. 50 of 8 August 2019. This way, data collection is guaranteed anonymously on an HPE Proliant DL380 Gen 10 server. Besides, the system is programmed so that the information is *"aggregated"* and *"sent"* hourly to the server through the https protocol, guaranteeing the pseudonymization of the data. The service includes a Data Protection Officer, who ensures and audits the compliance of the process with the GDPR and Law No. 58/2019 of 8 August.

PPV Data Mining provides real-time reports, tables, and graphs, where the marketer will be able to observe the business temperature.

RESULTS

Within the 234 calendar day time horizon, 72% of male visitors and 28% of female visitors visited the global points of sale. The male audience is predominant (Table 1).

Table 1
GLOBAL POINTS OF SALE

Genre	Men	Women
Units	2.358.720	917.280
%	**72%**	**28%**

Source: Data Mining PPV

However, the overall result for the 20 stores as a whole may lead to errors in decision making by the marketeer. Given that, at one of the filling stations, in the center of a city in Porto, the results that are removed are different, in the same period of analysis, there were a total of 813,931 visitors (24.8% of the total). Overall, there is a balance between the two genders (Table 2).

Table 2
DECISION MAKING BY THE MARKETEER

Genre	Men	Women
Units	416.650	397.281
%	**51%**	**49%**

Source: Data Mining PPV

On the other hand, in generational terms, the population observed in global terms was divided by generation W (25-34 years) with a weight of 33.1% and generations Y and X (35-49 years) of 43, 2 %. Both represent about 76% of the total population. Whereas, the Baby Boomer generation (over 50 years old) represents 14.9%, the Z generation (18-24 years old) 7.2%, and finally, the Alpha generation (8-17 years old) represents only a weight 1.6% respectively (Table 3). The same happens, when we observe, the post in the center of a city in an autonomous way, where the generations W, Y, X start to assume a predominant position, assuming a value close to 50%, to the detriment of the Baby Boomer generation (larger 50 years).

Table 3
THE POPULATION OBSERVED IN GLOBAL TERMS

Generation	Units	%
Generation W (25-34 years)	1.084.356	33.1%
Generations Y e X (35-49 years)	1.415.232	43.2 %
Baby Boomer Generation (over 50)	488.124	14.9%,
Generation Z (18-24 years)	235.872	7.2%,
Alpha Generation (8-17 years)	52.416	1.6%
TOTAL	**3.276.000**	**100%**

Source: Data Mining PPV

In turn, it is also possible to obtain the segmentation of consumers by the time of the visit (Table 4) in Data Mining PPV.

Table 4
THE SEGMENTATION OF CONSUMERS BY THE TIME OF THE VISIT

Visit time	Units	%
Breakfast (7-10 hours)	681.408	20.8%
Morning (10-12 hours)	438.984	13.4%
Lunch (12-14 hours)	386.568	11.8%,
Afternoon (14-16 hours)	393.120	12.0%,
Snack (16-18 hours)	399.672	12.2%
Late afternoon (18-19 hours)	193.284	5.9%,
Dinner (19-21 hours)	321.048	9.8%
Night (21-23 hours)	235.872	7.2%
Dawn (23-07 hours)	226.044	6.9%
TOTAL	**3.276.000**	**100%**

Source: Data Mining PPV.

Of the total population observed, 20.8% visited convenience stores for breakfast (7-10 hours), 13.4% in the morning (10-12 hours), and 11.8% at Lunch (12-14 hours). Representing 46% of total visits. In the afternoon (14-16 hours) about 12% of visits to stores, Snack (16-18 hours), 12.2%, and Late afternoon (18-19 hours) 5.9%. This group represents about 30% of the visits. Finally, at dinner time (19-21 hours) we have 9.8% of visits and at night (21-23 hours) 7.2% and at dawn (23-07 hours) only 6.9%. The latter group represents around 23% of the visits. And if we wish, by visiting time and by consumer pattern.

CONCLUSIONS

In neuromarketing, a market segment is understood as a group of consumers who develop similar expectations and emotional responses with a marketing stimulus (brand, product or

service, and price), presenting identical brain patterns. In a heterogeneous market, consumers respond neurologically in a different way and it is this discrepancy that causes different preferences, behaviors, and consumption decisions. Through the digital data mining PPV framework, marketers will be able to answer the following questions:

1. What is the time and pattern of consumers entering the point of sale?
2. Who are the consumers who see the advertising campaigns?
3. How many advertising campaigns were run and attracted consumers?
4. Can you quantify the time when *"impulse sales"* by consumer patterns resulted from viewing the *"advertising campaigns"* displayed?
5. We will know how to respond in real-time, what is our PPV conversion rate. What is the ROI by target?

Through the Data Mining PPV digital framework dashboards, marketers will be able to observe the business temperature in real-time. One to one promotions can be made. It will allow the creation of an advertising playlist adjusted, and increasingly, more optimized to the needs of each consumer. It will make it possible to segment the ads from the morning, afternoon, or evening period, presenting them according to the season, automatically through Deep Learning. Guaranteeing the return on investment (ROI) in the promotion of brands, products, or services, allowing boosting the PPV conversion rate of the *"Partners/Suppliers"* advertising space by around 30%. Allowing greater satisfaction and involvement on the part of *"Partners/Suppliers"*. Motivating them, in this way, to participate in the advertising investment at the point of sale and to involve them in the participation of the subscription value of the Data Mining PPV project. Each application per point of sale has a cost of 65 euros, representing an annual cost of 780 euros a year, with a minimum loyalty period of 3 years. Practically, in all 20 filling stations, the application was amortized in the first month, which went into operation, allowing an average global increase of 30% in impulse sales.

Regarding the limitations of the study, we can mention that this study aims to be applied in a company that produces and sells fuels, and its purpose is to observe and analyze and win over its customers in its convenience stores. As future investigations we can indicate the application of this study, comparatively, in other organizations, trying to understand its impact of the Data Mining PPV applied to the promotion at the point of sale.

Although neuroscience is still a relatively new field, the historical context, merges with the future perspectives, to preserve such complexity when exploring the human brain. Meeting the 17 sustainable development goals established by the United Nations Organization (UNO), the work also aspires to make a significant contribution to society, especially by addressing a brief reflection in favor of conscious consumption. The fact is that it is useless to attract the consumer's attention, appeal to their emotions, and convey the message if the value that is perceived in the product is not adequate to the consumer's desires and other personal issues.

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