NEUROMARKETING SERVICES: AN ANALYSIS OF INTERNATIONAL SPECIALISTS' EXPERIENCE

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ABSTRACT

The purpose of the present research is to provide a detailed description of the neuromarketing services market at international level by analyzing the experience of neuromarketing service providers. Based on the up-mentioned research purpose, three research objectives were derived (1)(2)(3). The needed data for fulfilling the research purpose and objectives was gathered through an online applied survey. After analyzing the specialists' opinion, based on their experience regarding (1) the industries that can benefit the most of neuromarketing research, (2) frequently used neuromarketing techniques and (3) the relationship between traditional research and neuromarketing research, the following conclusions can be drawn: neuromarketing research fits best for the study of consumer goods; most specialists most often use the Eye-tracker in their research, the eye-tracker or the analysis of galvanic skin response, but other techniques and instruments can be used to measure different types of variables; traditional research and neuromarketing research go together almost always, neuromarketing research being more relevant than traditional research when attention, visibility, emotion, pleasure or contempt are elements that, if studied, can generate valuable information about the marketing stimulus.

KEYWORDS: *consumer behavior, neuromarketing, neuromarketing research techniques*

1. INTRODUCTION

In a world of consumerism and globalization, marketing has a vital role in developing not only businesses' profit but, most importantly, their role for the society. Nowadays consumers do not pay for the product or service itself, but for the experience and the feeling they receive. Given the multitude of products and services, their variety and attractiveness, marketers have to go beyond the expressed needs and desires of the consumer and identify the mental processes that trigger a choice and that, in the end, lead to satisfaction.

Neuromarketing as a research method comes as a bridge between consumer science and neuroscience, creating the opportunity for new, innovative studies. Being a new and diverse field, every bit of experience in the field comes in handy for developing future, improved studies. This is the context which motivated the authors to find out more about the field experience of neuromarketing specialists all over the world. Based on the mentioned purpose, several research objectives were developed. For the present paper, the first three research objectives are detailed, as following: (1) identifying the industries for which neuromarketing services are of significant relevance; (2) determining the techniques most often used by neuromarketing specialists in their studies; (3) identifying how traditional research methods combine with neuromarketing research in internationally-provided neuromarketing services.

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2. NEUROMARKETING AND THE STUDY OF CONSUMER BEHAVIOR

Neurosciences are based on the study of the nervous system in order to understand the biological determinants of human behavior (Plassmann, Ramsoy and Milosavlejevic, 2012). Referring to the economic particularities of the general neuroscience field, we can say that neuroscience was born through the collaboration of specialists from two major fields - economics and neuroscience - researchers who generally pursue different objectives in their studies. The successful recipe for this partnership remains the formulation of objectives in such a way that the economic objective is fulfilled by formulating the answer to the functional questions (Pop & Iorga, 2012).

We will now refer to the major difference between neuromarketing and neuroeconomics. Although both areas of science are based on the analysis of consumer neuronal responses, neuro-economy aims to identify and understand the system based on which consumers make choices, while neuromarketing aims to influence these choices, either individually, at group or at society level. The variables used by neuroeconomy with regard to the consumer (for example, the analysis of the reward that may or may not be received as a result of behavior or fear of outcome) are then taken up by neuromarketing and combined with other neuroscience behavioral and psychological constructions (in general, memory, attention and perception - the basic compounds of emotion), aiming to influence them and obtaining a desired result (Breiter et al., 2015).

New technologies and innovations have facilitated the collaboration of different areas and the combination of their research techniques in the development of society in general and companies in particular. Neuromarketing has come as a bridge between consumer science and neuroscience and has led to many exciting research that created waves among readers through books like Buyology (Lindstorm, 2008) or "Your Brain Is (Almost) Perfect: How We Make Decisions "(Montague, 2007), books that have been appealing to both ordinary readers and marketers.

Since 1994 (Damasio, 1994), when scientists have begun to recognize the importance of emotions in adopting specific behaviors, the last 25 years can be defined as vital in developing the science of neuromarketing. Even if it seemed impossible, we can now, through sophisticated and precise technologies, record, analyze and use what's happening in the mind of the consumer. The outcome of all these possibilities has resulted in the gradual emergence of the Neuromarketing discipline that does not come as a replacement, but as an added value for traditional marketing research techniques, adding information about how the consumer behaves and information about the mental process that stays at the basis of the adopted behavior (Lewis, 2004).

The first study that can be considered as belonging to the neuromarketing field was published in 2004 and was written by Read Montague, professor of neuroscience at Baylor College of Medicine. The study referred to the preference for the Coca-Cola vs. Pepsi under conditions where the mark was or was not known, this being experimented on 67 subjects who tasted the two beverages while they were scanned by fMRI (functional magnetic resonance imaging). Although the study failed to provide a rational explanation of how the brain manipulates the choices of a brand, the study was able to show which areas of the brain become active under the influence of various stimuli, correlating the regular cognitive functions of the brain with the observed reactions (du Plessis, 2011).

Perhaps it is not unexpected that some people have begun to criticize the new idea of neuromarketing, categorizing it as unethical and immoral, fearing that this will allow companies to change their human perception to their advantage and to the detriment of the consumer. The result was the "Brain Scam" article, published by Nature Neuroscience (2004), which addresses the ethical issue of neuromarketing. The result of this media attack was not enough for people to stop exploring the new, exciting and surprising area of neuromarketing and in 2005 "neuromarketing" was added to Harper Colling's dictionary as a sign of recognition of this field of science as existing and useful (Morin, 2011). Finally, it is obvious why neuroimaging, which allows observation and understanding the mind of the consumer, was no longer an area to be ignored. Moreover, it is

important to remember that this combination of domains allows researchers to overcome the conscious, expressed opinions of subjects and therefore makes a valuable contribution by increasing awareness and absorption of social campaign messages. It is also important to remember the significant amounts of money spent by companies in trying to create a perfect marketing message. Neuromarketing therefore opens the opportunity to create safer, more efficient and less costly marketing campaigns.

2.1 Neuromarketing research techniques

Zuravicki (2010), Kenning & Plassmann (2005), and Calvert & Thensen (2004) divide the techniques used in neuromarketing in three major categories: (1) those studying the metabolic activity of the brain, (2) those recording the electrical activity in the brain and (3) those not recording brain activity. Having this classification in mind, we can name the following research instruments in the field of neuromarketing: (1) positron emission tomography (PET), functional magnetic resonance imaging (fMRI); (2) Transcranial magnetic stimulation (TMS), electroencephalography (EEG), magnetoencephalography (MEG); (3) facial encoding, eye tracking, pupil dilation analysis, facial analysis, skin galvanic response;

Taking into consideration the scientific articles and the analyzed researches (Al-Kwifi, 2016; Falk et al., 2016; Laeng et al., 2016; Fugate, 2008; Pieters et al., 1999), the most common and most frequently used instruments in neuromarketing are: fMRI, EEG, the eye tracker.

Functional Magnetic Resonance Imaging (fMRI) is considered to be one of the most advanced technologies in neuromarketing studies because of its ability to map brain activity with high resolution and to capture changes, especially under the influence of emotional stimuli. This technology combines magnetic field and radio waves, producing signals that allow real-time brain reactions to be studied. The study of consumer behavior through fMRI technology has proven to be very interesting, by only studying the reactions of the brain under the influence of stimuli being able to generate conclusions on the behavioral pattern of the consumer. Milosavljevic, Koch and Rangel (2011) have demonstrated through the direct study of the brain that consumers can identify two different brands of food and decide which one of them they prefer in just 313 milliseconds. The time distance between the preference formation and the buying/consuming action might be a risky time window in which the consumer may be induced a third brand as a choice.

For the application of this technology, the subjects are placed in a cylindrical device and the brain blood flow is studied while the marketing material is presented. The technique is based on the analysis of the blood oxygen flow that comes from the lungs to the brain monitoring the sections with high activity of the blood. When neurons become active, they consume more oxygen, and these changes create distortions in the magnetic field emitted by hydrogen protons in the water molecules in the blood, making it easy to observe the active areas of the brain (Peruzzo, 2013; Morin, 2011).

The EEG is the second most commonly used technique after fMRI. The device captures brain waves and, based on wave amplitude, certain brain states can be identified: awakening (beta waves), relaxation (alpha waves), calm (theta waves), and sleep (delta waves). The location of the alpha waves in the left front lobe, for example, indicates a positive emotion and therefore the level of motivation of the subject to act in a certain direction.

Electroencephalography (EEG) works through electrodes (up to 256) placed on the scalp of the subject, electrodes that measure the electrical energy present in the analyzed areas. The subject is exposed to a marketing stimulus and the recorded voltages and frequencies are measured and then compared to those obtained in t0, measured without the influence of the stimulus. Some of the new and advanced EEGs can measure the state of the electricity in a certain area with a frequency of up to 10,000 times per second. A great advantage of the EEG is that it is portable and therefore can be used in real market conditions. Even though the EEG has gained a lot of popularity in neuromarketing agencies, it is still considered insufficient in some cases due to the fact that beyond

an analysis of the value of a marketing message we are unable to correlate the effect obtained with the cognitive process that triggered it. (Peruzzo, 2013; Morin, 2011).

It can be said that the truth of consumers lies in their eyes. The eyes are those that take and transmit the visual information to the brain and what they are looking for, for how long and what attracts their attention is important to be known in order for the communication between the company and the consumer to be improved. Pieters and Wedel (2007) have shown that in order to increase the chances for a consumer to pay attention to every piece of information on an advertising poster, we must ensure that the consumer first pays attention to the brand logo. The positioning of shelf products may appear as an advantage or disadvantage for the brand; For example, people tend to look at the top of the field of vision (Durgin, Doyle, & Egan, 2008) and on its right side (Efron & Yund, 1996), which becomes very important in consumer behavior when we refer to design and arrangement at the point of purchase. In a well-known study (Nissbet & Wilson, 1977), when five identical products were displayed horizontally, the subjects were skeptical in choosing the ones from the extreme.

The eye tracking device is a tool commonly used in neuromarketing studies, but is usually combined with other technologies to obtain information from multiple perspectives, correlating the obtained results with the cognitive and emotional responses indicated by the consumer. This technology is not at all invasive, providing a way to study consumer behavior without a real measure of brain activity.

Through eye tracking devices, researchers see the exact points that subjects follow when viewing a promotional poster or video message, recording the duration they keep their eye on each point and the dilation of their pupils at every moment or at certain times. Pupil dilation can also be studied with the pupilometer.

Plassman et al., (2011) and Zurawicki (2010) asserts that there are two phases of eye movement when talking about stimulus reactions: one is fixation - when the eye is fixed in a position and the second is the saccade, the moment of passing the view from one point to another. Visual perception, cognitive intent, interest, and significance are analyzed through scan paths (scan paths = result of fixation and saccade alternation). Several studies (Fidelis et al., 2017; Pieters et al., 1999) have shown an almost intuitive aspect, namely that the time allocated to studying a marketing message (poster) decreases with the repeated display of the same message. What is interesting, though, is that although the time for the message decreases the scanning paths (the order in which the items are viewed) remain the same even after several views of the same message.

In the context in which it was shown that people spend more time examining the product option they will ultimately choose (Glaholt & Reingold, 2009; Velasques & Pasch, 2014), eye tracking tools become an important asset for marketing people.

With regard to the types of eye tracker that are used, we can name two models: one is the fixed eye-tracker (mounted on the table), while the second model is the eye-tracker in the form of glasses, usually used for research on the move (cars, supermarkets). Based on eye movement, when it comes to an image, researchers can create a map of areas of interest specific to each consumer.

With regard to the construction of a marketing message (poster, banner etc.), Pieters & Wedel (2004) identified three key elements: image, text and branding (name, trade mark, logo). In general, they conclude that the image is the most attractive element, and that retention of attention will take place regardless of the size of the image; Text captures attention by size, while the logo is the most effective element to transfer attention from one element to another.

With regard to pupil dilation studies, previous studies have suggested that variation in pupil dilation may be related to processing of cognitive and affective information, and that usually an increased cognitive load is related to pupil dilation (Partala & Surakka, 2002). Hess (1972) showed that pupils dilate to exciting and pleasant stimuli and contracted to unpleasant or disagreeable material sight. Janisse (1974) stated that there is no contraction of pupils at exposure to negative stimuli, but only

dilation of pupils as a result of intense stimuli, either positive or negative. This last result was also obtained by the authors of the present study in a past research.
In order to obtain primary information regarding the most frequently used techniques, their efficiency but also information regarding the collaboration between neuromarketing companies and the market, the following research was performed.

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3.1 The Preliminary Phase of the Research

This research seeks to identify the specific aspects of the neuromarketing services market. Although the decisional problem does not describe a particular situation, the results of the research can be successfully applied in situations that seek a detailed knowledge of the attitude of the users of the neuromarketing services and the experience of the providers of such services.
The purpose of this research is to provide a detailed description of the neuromarketing services at international level from the point of view of the neuromarketing service providers.
Derived from the research purpose, 7 research objectives were established. The present paper will present the findings and conclusions of the first three objectives, the last four remaining subject to a future paper.

- Objective 1 – identifying the industries for which neuromarketing services are of significant relevance
- Objective 2 - Determining the most commonly used techniques by neuromarketing specialists in their studies
- Objective 3 - identifying how traditional research methods combine with neuromarketing research in internationally-provided neuromarketing services

3.2 The Design Phase of the Research

During the design phase the sources of information, the ways of using the data, the schedule of the research and a systematization of the existing data were established. Thus, the sources of information were external (from the point of view of the origin of the source in relation to the researcher), namely persons of different nationalities, specialists in the field of neuromarketing. The information used is primary, and its collection was done using the survey method, the questionnaire being used as a data collection tool. This research is based on information provided by individuals free of charge, the respondents being selectively elected. The actual data collection was done by direct field research during 12.02.2018 -20.03.2018.
Given that this research is exploratory, the size of the sample used was not calculated and it was not statistically representative. The number of respondents was 10 people aged 26 to 65, neuromarketing specialists working in markets such as Central America, USA, Brazil, China, France, New Zealand, Australia, Chile, Poland, Finland and Mexico, Croatia, Belgium, Austria.
From the gender perspective, 8 respondents were male, only 2 female.

3.3 The Research Phase

The actual realization of the research began with the collection of data, made by distributing the online questionnaire, to 220 neuromarketing specialists from all over the world. The questionnaire was conducted in English on the online "Free Online Surveys" platform and was distributed via e-mail. Out of the total number of people targeted by the questionnaire, 4.5% completed the questionnaire as a whole, these responses being considered further in the text analysis and interpretation.
In the following part the questions, answers and interpretation of the neuromarketing specialists' opinions and expertise will be presented for each of the three discussed objectives.

• Objective 1 – identifying the industries for which neuromarketing services are of significant relevance

In order to understand the use and value of neuromarketing services, we must first know which industries can benefit most from this type of research. The neuromarketing specialist had therefore to name these industries in general, then particular for the retail and services industries.
If some of the responses supported the effectiveness of neuromarketing as a method of research for any industry, especially for those where consumer communication is crucial and where meeting the extended needs of the consumer is considered by companies to be a goal to be met, other responses were more focused, naming specific types of economic activities that can successfully use the neuromarketing services. Thus, the most common response was that consumer goods is the best suited field for neuromarketing studies, given the multiple product variables, packaging, shelf, content, or price. Other respondents have concluded that neuromarketing can be effective in any area where there is a desire to study consumer experience and develop it from a qualitative point of view.
Other industries identified by the respondents were those of the automotive, the banking services market, government services, or advertising.
In terms of retail industry, not surprisingly, the consumer goods sector has again been the most frequent response given by neuromarketing specialists, accompanied by products / industries such as household appliances or personal care products. One specialist argues that neuromarketing services are most effective and relevant when applied to well-known brands, the mental processes generated by these brands being more complex, involving memory and experience, creating relevant results much easier.
In terms of services and neuromarketing match, the most frequent response was banking services, followed by mobile services, government services, online services, advertising services, financial services, insurance services, public transport services, hotel chain services, medical services, educational services and social services.
The high frequency of the "banking" response can also be justified by the financial availability of this service sector to use more elaborate and costly research methods such as neuromarketing. When analyzing this frequent opinion of neuromarketing specialists and the match between the banking system and neuromarketing, we cannot ignore the limits of consumers' emotional involvement in taking financial decisions. Even if this sector might be financially available for contracting neuromarketing services, it might be that the impact and value of this type of research will not be worth the cost.

• Objective 2 - Determining the most commonly used techniques by neuromarketing specialists in their studies

This objective was addressed through 6 items (questions) regarding neuromarketing techniques, as it follows: used techniques, analyzed variables, techniques used for studying emotions, memory, attention and the difference between real life and artificial environment research.
In terms of most often used techniques in the neuromarketing services market, most specialists use the eye tracking device in their research, providing a wealth of information about where the subject looks and for how long, as well as statistics of pupil dilation viewing a poster or video ad. The next most commonly used technique is the analysis of electrical waves generated by the brain under the influence of a marketing stimulus using Electroencephalography (EEG), followed by the analysis of galvanic skin reactions. Other techniques presented by respondents as being frequently used are:

• Functional Magnetic Resonance Imaging (MRI);

• Facial coding - analyzes facial movements as a response to stimuli based on a system originally developed by Carl-Herman Hjortsjö (1970);

• Electrooculography - is the technique of detecting eye movements by recording the corneal potential between the front and the rear of the human eye. The procedure is performed by positioning four electrodes around each eye and determining, in a XOY axis system, the position of the eye and the length of time for which it remains in fixation or saccade (Hema, Paulraj, & Ramkumar, 2014);

• Priming - is based on the principle of associative activation and involves the introduction of subconscious clues in the marketing stimulus used in order to generate a desired response (Lobna, 2014)

• Reaction time measurement - involves reducing (or even eliminating) thinking time for the consumer, thus excluding rational evaluation. During testing, the consumer will have to perform certain tasks as soon as possible, making his choices irrational, therefore the researcher being able to find out his real intentions about the product being studied;

• Implicit association test - as a combination of priming and reaction time measurement, the default association test (IAT) generates a simple task for the consumer to highlight the automatic associations it carries between certain concepts - for example between a product or brand and certain benefits or values identified (www.projectimplicit.net).

• Deep Rooted Drivers of Behavior - Analyze the desire for action to meet a need. When this intention to act in a sense takes place in the consumer's brain, a certain satisfaction is created in regard to the foreseen pleasure that will be achieved by satisfying the need, the consumer experiencing emotions that can be identified by chemical analysis. We can therefore say that the product / service that will generate a high dopamine secretion will most likely be purchased to meet a specific need (https://www.warc.com/Newsandopinion/News/37390).

• Gamification - involves the development of games, whether online, digital or in natural environments, which eventually place product information in consumer's memory in an unconscious manner (Https://Blog.Neosperience.Com/4-Inspiring-Examples-Of-Gamification-To-Enhance-Your-Customer-Experience)

In terms of most often studied variables by neuromarketing techniques, the most frequent answer was attention (visual, auditory etc.), but also others such as: commitment to marketing stimulus elements; Attractiveness of the marketing stimulus elements; Matching between elements; Subconscious perception of the elements being analyzed; Response time at change (explicit and implicit); Emotional involvement - sense and intensity of emotions under the influence of the stimulus; Call to action response; Frontal asymmetry - a more intense activity on the left side of the brain than the right one indicates a positive emotional processing, correlating with a high commitment; Views per minute; Intensity of implied trademark association; First fixation time; Points of view; Time spent on points of interest; Number of fixations; Pupil dilation;

For analyzing emotions the mentioned techniques being most frequently used were the analysis of galvanic skin response and face coding analysis or a combination of the two. Also, a frequent response was the EEG (electroencephalograph) as an emotion analysis technique, along with techniques such as reaction time test and fMRI (functional magnetic resonance imaging).

In addition to the classic interview technique, most specialists have stated that for the analysis of memory elements they use the technique of testing the reaction time, based on the connection between memory and response. The next most commonly used technique was testing the default association (IAT), followed by the use of the eye tracker, fMRI and brand recall test.

It is not surprising that most of the respondents stated that most frequently they use the eye tracking device for attention analysis, this providing various information about the level of interaction of the subject with the marketing stimulus. Other techniques used in this field are EEG and fMRI.

The last analyzed item in regard to this objective was the opinion of neuromarketing specialists regarding the differences and value of real life research vs. artificial research environments. The

analysis of the answers to this question indicates a slight trend towards the benefit of real, natural environments, but opinions are divided. Two of the respondents are neutral, arguing that both research environments are appropriate and relevant, the differences being generated by techniques applied and the objectives of the study.
On one side there are 4 specialists who minimize the relevance of natural environments, saying either they do not know studies in natural environments that are relevant because natural environments have too many distortion elements that have an effect on the subject, research being flawed. The artificial environments are also preferred for situations where new products are tested, as long as the environment created is as close to the natural one as possible.
At the opposite end there is a majority of 5 subjects that support natural research environments as supporting relevant results. Some of the respondents do not completely discredit the laboratory analysis, but they argue that this should only be a starting point. Another respondent says, "If you want to know how animals live, you do not go to the zoo, you go to the jungle. As long as budget and time allows, analysis in the natural commercial environment is the best ".

• Objective 3 - identifying how traditional research methods combine with neuromarketing research in internationally-provided neuromarketing services

This objective is addressed through three questions, refereeing to (1) traditional research methods that are used in combination with neuromarketing research, (2) situations when neuromarketing research proves to be more efficient than traditional research and (3) neuromarketing research techniques that can be easily integrated in online research.
One of the classic techniques most frequently combined with neuromarketing techniques is the survey, many times indispensable in neuromarketing studies, offering the possibility of correlating explicit and implicit perceptions (e.g. testing reaction time as a method combines the survey with the response time recorded by the analysis software). By pursuing the same goal, correlating the elements expressed with the thought/feeling, as well as developing the neuromarketing research, the focus group is used as a traditional technique.
By comparing the value of traditional vs. neuromarketing research, some specialists stated that neuromarketing techniques will always be more effective than classic research techniques. Others have said that neuromarketing research is much more relevant when attention, visibility, emotion, pleasure or contempt are elements that, if studied, can generate valuable information about the marketing stimulus studied, or vice versa, if these reactions already appear among consumers, neuro-marketing research can justify them. Testing and creation of advertising material also seems to be a situation where neuromarketing is of great value.
Even if some respondents say that all neuromarketing techniques can be integrated into online research, most specialists have called Implicit Association Testing (IAT) the most appropriate for online research, followed by the use of the eye-tracker, facial coding and reaction time analysis. These techniques are based on software that can be remotely operated through the computer.
An interesting mention made by one of the specialists was that online neuro-marketing research may often not be relevant due to the limitation of the researcher's control over the environment and the external influences of the respondent.

4. CONCLUSIONS

Generally, it has been shown that neuromarketing as a research method is most relevant when it comes to the study of consumer goods in particular because of the multiple points of contact between the consumer and the product under consideration. If we refer to services industry, the neuromarketing services proved to be most effective when applied to banking services.

Most specialists most often use the Eye-tracker in their research. The next most commonly used technique is the analysis of electrical waves generated by the brain under the influence of a marketing stimulus using Electroencephalography (EEG), followed by the analysis of galvanic skin reactions.

The most frequently studied variable through neuromarketing techniques is attention.

From the point of view of the techniques used to analyze the various variables, emotions are analyzed by analysis of the galvanic skin response and face coding analysis or a combination of the two; memory is analyzed by reaction time testing or implicit association test (IAT test); attention is most often analyzed using the eye-tracker.

Through a comparative analysis of natural vs. artificial research environments, it can be concluded that, as long as time and budget allow, research in natural environments is the one that will provide more relevant results. The limitations of this type of research remain those of an insufficient level of environmental control.

In terms of combining traditional research with neuromarketing, almost always the survey and focus group as classic research techniques will be part of the neuromarketing studies.

Keeping the two categories of research methods (traditional vs. innovative) in balance, we can conclude that neuromarketing research is more relevant than traditional research when attention, visibility, emotion, pleasure or contempt are elements that, if studied, can generate valuable information about the marketing stimulus studied.

When talking about online neuromarketing research, Implicit Association Testing (IAT), use of the eye-tracker, facial coding analysis, and response time analysis have proven to be best suited for online research.

In the end, based on the experts' opinion, we can conclude that the neuromarketing is indeed a field that combines traditional research methods with innovative approaches of marketing research, aiming to offer companies better, clearer and more detailed information regarding the processes that consumers undertake in their decision process. Each type of variable that is studied through traditional research can be also studied through neuromarketing. What is important in the end is not to deny traditional research techniques, or the neuromarketing ones, but to embrace each possibility – or a combination of the two – and to apply the correct technique to each case, depending on the industry type or decision problem in order to deliver valid results.

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