

**Artificial Intelligence Applied to Marketing Management**  
**– Trends and Projections According to Specialists**

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## Resumo

A Gestão de Marketing é uma das áreas que tem vindo progressivamente a integrar sistemas de inteligência artificial, e a cadência do desenvolvimento de softwares inteligentes com grande utilidade para parece não abrandam. Na verdade, o crescimento e o grau de sofisticação dos sistemas tecnológicos prometem aumentar cada vez mais, o que promete afetar a vários níveis as operações e até a definição de estratégias de marketing e de gestão.

Na tentativa de avaliar e medir os impactos da inteligência artificial nos departamentos de marketing no curto/médio prazo, procedeu-se à realização de um Delphi. Para isso reuniu-se um painel de 21 especialistas na área do marketing e da inteligência artificial (13 portugueses e 8 internacionais), ao qual foi colocada uma série de afirmações para que fossem avaliadas numa escala de *Likert*, comentadas e debatidas. Neste caso tratou-se de um Real Time Delphi uma vez que o estudo foi realizado recorrendo a uma plataforma online, o que permitiu que todos comentários ficassem imediatamente disponíveis e visíveis a todos os participantes.

Com este estudo, de cariz marcadamente exploratório, concluiu-se que as áreas que se esperam vir a ser auxiliadas por sistemas inteligentes em maior medida – ou seja, as áreas que assistirão à automatização de um maior número de operações – são o reconhecimento do cliente, segmentação de mercado, previsão de vendas e comunicação programática. Por outro lado, os temas que mais controvérsia geraram entre os especialistas – sendo pouco seguro retirar ilações – referem-se à operação autónoma de ajustes e desenvolvimentos de websites, bem como à adoção de sistemas inteligentes para servirem de apoio à tomada de decisões estratégicas e de planeamento.

Palavras-chave: Inteligência Artificial aplicada ao Marketing; Machine Learning; Delphi em Tempo Real; Tendências de Marketing.

## **Abstract**

Marketing Management is one of the areas that has been progressively integrating artificial intelligence systems, and the pace of the development of intelligent software that is very useful for marketing seems not to slow down. In fact, the growth and sophistication of technological systems promise to increase even more, which will inevitably affect operations as well as management and planning.

In an attempt to assess and measure the expected impacts of AI on marketing departments in the short / medium term, a Delphi was carried out. Thereby, a panel of 21 marketing specialists (13 Portuguese and 8 international) was gathered, which was asked to evaluate on a Likert scale a series of statements, and to comment and debate among them. In this case it was a Real Time Delphi since the study was conducted using an online platform, which allowed all comments to be immediately available and visible to all participants.

With this exploratory study, it was possible to conclude that the areas that are expected to be helped by intelligent systems to a greater extent – this is, the areas that will assist the automation of more operations - are customer recognition , market segmentation, sales forecasting and programmatic communication. On the other hand, the two most controversial statements among experts - thus risky to draw lessons - were statements regarding the autonomous operation of website adjustments and developments, as well as the adoption of intelligent systems to support strategic and strategic decision-making.

Key words: Artificial Intelligence Applied to Marketing; Machine Learning; Real-Time Delphi; Marketing Trends

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## **1. Introduction**

This first chapter aims to frame and present the study carried out following this dissertation.

To better understand the topic of research, the chapter is divided in 3 sub-chapters – first, the current context of trends regarding artificial intelligence (AI) applications in the marketing field will be introduced, followed by the definition of the research problem and presentation of the main objectives, and, finally, the general structure of this dissertation.

### **1.1. Actuality and Trends of Artificial Intelligence in Marketing**

Increasingly, information technology and artificial intelligence play a core role in the development of companies' activities, integrating the root structure of many businesses. Gartner (2017) predicts that by 2020 AI will be a top five investment priority for more than 30 percent of companies. According to Pettey & Meulen (2018), it is expected that AI business value will reach \$3.9 trillion by 2022 – that is three times higher than in 2018 (\$1,2 trillion).

Customer recognition is not yet mastered by most companies. An IBM Watson study (2017) showed that 81% of companies claim to have a holistic knowledge of their consumers, when only 37% of consumers claim that their favorite brands know them and understand their needs. Therefore, catching customers insights through AI is one of the main trends of Marketing on the upcoming years.

In addition, personalization of products and services is an unavoidable trend as, according to Salesforce Fourth Annual State of Marketing, 65% of B2B buyers say they will switch suppliers if the company does not attempt to customize communication (Davis J., 2017). The same article suggests another trend line, which has to do with improving the customer experience as a differentiating factor. In fact, 68% of marketers say it is part of their companies' marketing strategy to push actions that promote customer experience, as the greater the willingness to assist the customer with their buying hurdles, the greater the probability of generating a conversion. Chatbots are a great example of how technology is evolving and being applied to CRM to improve the ease of shopping.

Another trend that, even though not specific to any business area, will change several aspects and functions, is the expectation that in the upcoming years there will be a progressive elimination of repetitive tasks due to technology.

Partly related to this theme, the morality of AI is one of the most controversial topics of the present and coming years, not only with regard to labor changes, but also with data protection policies. The main concern is to determine to what extent technology and intelligent algorithms should rush into consumers' personal lives to improve customer knowledge.

## 1.2. Objectives and Research Problem

In order to better structure the purpose of this dissertation, this sub-chapter begins by presenting the general **objectives** of the study, then proceeding to the formulation of the **research problem**, and then to the presentation of the **research questions** to which we seek to answer.

Overall, the main objectives of the study are:

- Explore developments and changes in the different fields of marketing regarding the adoption of intelligent systems and automation of functions, in the short to medium term.
- Understand what kind of functions are most likely to be automated in the short / medium term, considering the functionalities available and vulgarization of intelligent systems.
- Prospect if AI will be useful for decision-making, and what to expect regarding the level of sophistication of AI and machine learning algorithms.
- Explore ethical foundations and bring insights of the impact of AI on roles and society at large.

Thus, we can briefly define the research problem as follows:

What will be the impacts of the development and implementation of artificial intelligence systems on marketing department activity?

In view of the development and solution of the research problem, we tried to answer the following research questions:

- Which innovative AI systems have been designed? Which have already been implemented in pioneer companies? Will there be widespread adoption of these systems among companies?
- Considering each area of marketing individually, what changes are expected?
- What benefits does it bring to companies? And what damage / downsides?
- Which labor functions can be easily replaced?
- What are the key challenges of implementing AI systems for businesses? And for society?

### **1.3. Structure**

This dissertation is divided into five chapters. To introduce the them, we find this first chapter that aims to provide a brief overview of AI's current role in marketing, present the main trends and define the objectives and main questions to which the study intends to answer.

The second chapter is reserved for the literature review necessary to get to know the subject of artificial intelligence at the service of marketing. Here we can find the reasons for its emergence and increasing development, as well as the changes it has caused to consumer behavior. The last subchapter intends to address each field of marketing individually, explaining to what extent they are becoming supported by AI systems.

The third chapter covers all the study methodology - first we present the Delphi method, as well as the variant we used, Real Time Delphi, and a brief explanation of the chosen platform (edelphi.org). Still in this chapter we present the questions made in the exploratory interviews to find the most pertinent statements for the panel to analyze and comment.

Then, we find the fourth chapter - the most exhaustive of this thesis – that covers the answers' analysis, and comments the experts wrote regarding the 17 questions.

The dissertation ends with the fifth and concluding chapter, which presents the summary of the results, the implications the study has for knowledge and management, the limitations of the study and suggestions for future research.

## 2. Literature Review

To better understand the contents applied, we begin by reviewing the most relevant subjects and trends found throughout the exploratory study. Thus, literature review comprises a brief overview of Artificial Intelligence (AI) definition, approaches, main features and ethical considerations. Then, it is presented a reflection on how the explosion of data we have assisted in the last years and the increasing need of optimization and profit increase were two main reasons that led to the emergency of AI in marketing. Besides, we consider the changes in consumer behavior - the share of content through online channels, and the increased weighting in purchase - were also triggers that made organizations redesign their marketing strategies.

Finally, we will go through the various marketing fields to survey the current state of technological development and show some example of pioneering companies to implement innovative intelligent systems.

### 2.1. Artificial Intelligence – Concept

The definition of AI is not a consensual subject among scientific community. Therefore, to better define the concept, we start by presenting its first definition, then the main approaches and, finally, the issue of risks and ethical considerations.

#### 2.1.1. AI Initial Definition

According to Pan Y. (2016), the first formally draft definition of Artificial Intelligence was established in 1956, at Dartmouth College, by a group of university professors - J. McCarthy, M. L. Minsky, H. Simon and A. Newell - along with C. E. Shannon, N. Rochester, and other scholars. They defined AI as “*the ability of machines to understand, think, and learn in a similar way to human beings, indicating the possibility of using computers to simulate human intelligence*”. Since then, AI has been in great expansion

for several research areas such as pattern recognition, automatic translation, physical/mechanical theorem proving, robotics, intelligent control and machine learning.

### **2.1.2. Two Main Approaches to Artificial Intelligence**

There are two research paradigms in AI in which the concept of AI lies in. Both these theories try to explain the path to machine learning by reproducing the human brain learning process, although they diverge radically in their attempts to reproduce this process of understanding and thinking through the usage of machine.

The first approach focused on formalizing the process of thinking into symbols, rules and world representations. This defends intelligence should be measured against an *ideal performance* indicator, called rationality (Russel & Norvig, 2010) which defines the ability for playing the “correct thing”.

Following this model, a machine could be able to *think rationally*, and/or to *act rationally*. *Thinking rationally* refers to reasoning processes thought premises that lead to inferences – the operation of the mind was governed by “laws of thought” lies in logical processes. On the other hand, some situations recall an immediate intervention, and *Acting Rationally* may be needed without the thinking process. For example, if somebody jabs a finger into a needle, it might not be recommendable to spend some time carefully deliberating whether or not to recoil it. In humans, these mechanisms are called *reflexes*; some are innate, other are recorded after an experience. In a robot life-journey, there could be some information that should be *taught* to give an automatic and immediate response, whether it is for machine integrity defense, or to assure its correct functionality. For example, it would be advantageous for a computer to interrupt the download of a program if it recognizes a pattern of system modifications that are known to be harmful for the hardware; and it should be done automatically, since downloads are often done in seconds.

On the other hand, there was the idea that simple logical operation approach - even if combined with some *trigger-response* mechanisms – might be too simplistic and inflexible to solve real human problems. In fact, the growing knowledge of human brain

highlighted the role of stochastic and parallelized information processing (Hassabis, Kumaran, Summerfield & Botvinick, 2017).

Thus, the second approach to AI was more directly inspired by neuroscience rather than cognitive psychology (Rumelhart & McClelland, 1986), and it evaluates the performance of a machine according to its *fidelity to human performance* – thinking and acting humanly.

One of the scientists who gave the first steps toward a better understanding of this model was Alan Turing, that in 1950 proposed the first operational test for identifying intelligence in machines. A computer would pass the Turing Test if a human interrogator, after posing some written questions, cannot tell if the written answers were given by a human or a computer. For a computer to fulfill the given task, it would have to possess several capabilities: Natural language processing – to communicate successfully in a given language; Knowledge representation – to memorize what it knows, hears or experiences; Automated reasoning – to use the stored information to develop conclusions and formulate responses; and Machine learning – to adapt new circumstances, detect patterns and make inferences. As we may notice, it takes much more than a simple one-way logic system to perform the given tasks (Sharkey, 2012).

In 1986, the concept of Parallel Distributed Process (PDP), proposed by Rumelhart & McClelland, arose, emphasizing that human cognition and behavior result from dynamic process, in which parallel computations combine simple units to collectively implement sophisticated calculations. This suggested that the exercise of thinking was not a one-division logical job performed in the most symbolical data structures, but a skew of cross-related neural networks distributed across different units.

### **2.1.3. Ethics and Risks Considerations**

The fast-passed development of artificial intelligence has been raising questions and worries, not only within the scientific community, but also among general world citizens. We all assist to the emergence of a wide variety of computerized systems able to perform tasks as successfully as human operators, and it becomes easy to find examples of robots that even manage to overcome human performance – either in speed, accuracy or multitasking-capability.



However, AI-based technology has reached great technological achievements, such as self-driving cars, automatic medical diagnosis systems, facial recognition, at the same time as it promises to bring social and economic growth, safety improvements, well-being and medical development.

Engineers and robotic scientists deal with ethical considerations about what projects should or should not be done, how robots should or should not act, and how they should be handled. In fact, AI creations seem to pose some questions that might be harmful to humans, directly or indirectly, for example: people might lose their jobs to automation, and their sense of being unique; AI systems could be used towards undesirable ends, there might exist doubts in responsibility attribution if some task is performed unsuccessfully, and, through a more dramatic and pessimist light, machines may take over the world and dictate the end of human race.

However, the other sides of AI ethics should be considered – can AI positively impact the world and human living? Is it dangerous to humankind or is it just the lack of common understanding – and the low-level explainability – about AI and machine learning that is bringing insecurity to individuals?

Considering one of the mentioned ways AI can threat human well-being – the replacement of workers for automatic devices – we can look at the consumer credit business. Credit card applications, charge approvals and fraud detection are now done by computerized systems, and it is true that thousands of workers could be hired to do the same tasks. However, if we took away AI these jobs would not exist because the cost of labor would not be an acceptable cost to the transaction. In fact, information technology has created more jobs than it has eliminated (Russel & Norvig, 2010).

It is true that putting technology in the wrong hands may cause harm, but with machine learning we have the added problem that the wrong hands may belong to machines their selves. For years we have been seeing science fiction stories of robots taking over the world, such as *Frankenstein* (1818), *The Terminator* (1984) or even *Matrix* (1999). Robots were exciting because they represented the unknown – like ghosts or witches. Now, AI does not belong to imaginary anymore, and the actual technology is programming real robots.

Isaac Asimov (1942), a science fiction writer, was the first to address the need to regulate AI creations, with the three laws of robotics (Barthelme & Furbach, 2014):

1. *A robot may not injure a human being or, through inaction, allow a human being to come to harm.*
2. *A robot must obey orders given to it by human beings, except where such orders would conflict with the First Law.*
3. *A robot must protect its own existence as long as such protection does not conflict with the First or Second Law*

Other regulating models were created to regulate AI Ethics, such as the *ART Principals* proposed by Dignum (2017). This model advocates a robotic designing should obey to three principles:

1. *Accountability* – the purpose of the invention should be clarified to partners, users and other with whom the system interacts;
2. *Responsibility* – refers to the role of people themselves, and to the capability of AI systems to answer for their decision and identify errors or unexpected results;
3. *Transparency* – there must exist the need to describe, inspect and reproduce the mechanisms through which AI systems make decisions and learn to adapt to their environment, and to the governance of the data used or created.

Increasingly, intelligent machines will be part of human life in a wide variety of forms. It is important to take in consideration that AI is meant to be useful to humankind and not harmful, and that AI development should respect and address societal values and morals.

Along with representing a risk to Humanity, AI brings an enormous potential to improve the lives of many, personally, professionally, medically, financially and, it could even be a tool to help assuring human rights to all. However, how this will be realized, depends on us.

## **2.2. The Emergence of Artificial Intelligence in the Marketing Field**

In recent years, we have witnessed a technological revolution in companies. Most of the business units delegate part of their activities and tasks to AIs, and marketing did not escape this trend. The proliferation of data derived from purchasing information systems, the primacy of social networks in consumers' lives, and the need to reduce costs and increase profitability are among the main reasons for the entry of AI into marketing departments.

### **2.2.1. Data Explosion**

Purchasing information systems, both in physical stores and online, allow capturing customer purchase data per item, following purchase patterns, and making buying proposals based on past actions.

Therefore, data became an incomparable asset that for defining strategy (Koetsier, 2018). However, given the size of the markets, it is not feasible for companies to work on this data individually.

According to Omnicore Agency (2019), in 2018, Facebook reached 2,32 billion monthly active users, while Instagram got to 1 billion, and Twitter make it to 321 million. Most members of these communities write comments, react to the contents, and share posts of other personal profiles or brand pages, generating millions of interactions per day. For example, on Facebook, every minute there are 317.000 status updates, 147.000 photos uploaded and 54.000 shared links.

Thus, social networks are a great source of information for marketing as it is important to know the opinions that customers and potential customers hold regarding new products, customer service or general performance.

Since it is not viable for brand managers to follow all these footprints and define consumer profiles and customer satisfaction levels, moreover with disperse information, there was the need for technological help to structure and treat the raw online data.

### **2.2.2. Need for Cost Reduction and Profitability Increase**

The opening of markets to international competition increases the pressure on costs reduction and leads companies to try to operate with lower expenses (Amaravadi, Samaddar & Dutta, 1995).

Indeed, several activities developed by human workers are somehow routines, in a sense that can be broken down into a series of repeated simple tasks that are relatively predictable (Ford, M., 2013). Since these jobs can easily be handled by machines, we have been watching several workstations getting occupied by AI devices – for example, chatbots.

Besides that, the AI also promotes sales by better matching production to the demand (Morgan, ElSobki & Osman, 2013). Through systems like *Demand Side Management* (DSM), applied to energy systems (Palensky, 2011), or other personalized algorithms that, throughout regressions, comparisons to previous weeks or months and pattern recognition systems, bring predictive insights about future sales.

Concluding, it is possible to understand how AI assists companies to reach their economic and financial goals – by cutting costs and increasing sales, profit grows and profitability increases.

### **2.3. Changes in Consumer Behavior**

The great change of the last 20 years in consumer behavior results from the growth in its power – with the generalization of internet and mobile devices, everyone can create content, comment, share, complain and give opinions in social media, forums and specialized websites.

Another tendency we discuss in this topic is the effects of the recently overcome economic crisis, that prompted demand for products and services at a lower cost, which had an impact on the development of marketing strategies.

### **2.3.1. Development of Uploads Internet**

Thousands of content uploads are made every day on online platforms. On social media, a considerable part of the contents generated refers to brands and products performance – from comments, to compliments, complaints or just explanations of a huge variety of brands are uploaded in social networks. These contents are then seen by page followers, that may react to the posts, comment and share them, creating an online word-of-mouth that companies are not able to delete and can hardly control.

Even the world's largest encyclopedia is created by volunteers and users. Wikipedia is a collaborative, universal and multilingual project established on the internet, with the propose of providing free, objective and verifiable content that everyone can edit and improve. This illustrates the willingness of citizens to participate in the generation of contents, and the trust users have among themselves without knowing each other.

In purchasing processes, this trust between consumers is also verified, being common to search for information in online forums, blogs and pages of social networks to assist buying decisions.

### **2.3.2. Increased Weighting in Purchase**

During recession, most consumers were forced to cut back on their spending. The decrease in monthly budget, coupled with the generalized rise in prices, has led to an increased rationalization of consumption, that is, a greater weighting of personal needs and expectations regarding a certain product or service (Mansoor & Jalal, 2011).

At the same time there was a great development in information technology, that became available for most people in developed countries. Along with this, it began to appear several websites specialized in price comparisons (Kannan & Kopalle, 2001). Even a simple search for a product in *Google* delivers automatically adds that immediately show online stores and respective prices.

Currently, the process of price comparison is often done in-store – through mobile devices it is easy to access to different websites to get information about products, compare features and prices. The easy and quick comparison of prices within competitors represents a major alert for sellers since they must monitor prices, value propositions, customer engagement and behavior of competitors, to adapt whenever at risk of getting dropped-behind. To follow market different offers, price managers started calling upon price bots (Kannan & Kopalle, 2001) – AI systems that automatically deliver prices of many different online stores.

## **2.4. Artificial Intelligence – Impacts on Marketing**

In this context, arising from the technological evolution and the shift in the behavioral patterns of the consumers, it is possible to verify that the AI may have a significant impact on the operations inherent in the marketing activities. This chapter presents the main areas in which AI has been applied and how it facilitates the work through the automation and increase the efficiency of actions and thus promote the attainment of objectives.

### **2.4.1. Market Research**

Information technologies and AI have been playing an increasingly important and revolutionary role in market research. The previously discussed data explosion brings an immense quantity of information, that may serve as “raw material” to be collected, treated and analyzed, such as social media user-generated contents, websites search history, blogs and opinion forums (Zeng, Chen, Lusch & Li, 2010).

However, it is not possible to take advantage of this amount of information resorting only to human labor. Even if possible, it would certainly not be viable, since it would take too many workers, too much time and costs to analyze this explosively growing, widely available and gigantic body of data.

The need for intelligent and powerful tools to uncover useful information, transforming raw data into market knowledge, led to the creation of *data mining* (Han J., 2011). Also

known as *knowledge discovery from data*, *data mining* refers to the science of extracting useful knowledge, patterns and trends from huge data repositories.

Data mining techniques have been applied to industry, medicine, science, government, engineering, and market research could not disregard this great technological appliance.

For example, considering a search engine software, such as *Google*, which receives hundreds of millions searches every day, and each search represents a topic of interest, doubt or curiosity. Some patterns found in user search queries can disclose valuable information, that could not be obtained by reading individual data, and this can help marketers identifying market tendencies.

For example, if in a given week, we identify a great number of searches on a recently launched smartphone specific model, we can predict an increase in purchase of this same model. Unless, for example, the searches are in the sense of diagnosing a problem of that smartphone. If so, we realize that many users have detected a flaw in the device, and it is likely that sales will slow down, possibly triggering a flood of complaints and a scandal that tarnishes the brand's reputation. In any of the cases, it is important for the company to be aware of those facts, so it can anticipate events and define strategies.

Besides, AI have enabled the emergence of tools to handle many other tasks, such as processing open-ended data, proactive community management, managing surveys (including spotting fraudulent responses), analyzing texts and passive data (ex: social media), automated reporting, among other functionalities that can become extremely useful to market researchers.

#### **2.4.2. Market Segmentation**

An important and useful data mining method is *clustering* – organizing items by groups (*clusters*) based on degrees of similarity, resulting in high homogeneity within clusters, and high heterogeneity between each group. (Chiu, Chen, Kuo & Ku 2009).

Marketers understood the potential of cluster analysis applied to market segmentation. By grouping clients with shared characteristics, it is possible to create products, services, brands, service levels and communication strategies personalized to address that public

needs and wants. Throughout clustering analysis, segmentation does not have to be done by subjective guesses of marketing specialists, nor by expensive and hard to validate market researches.

For example, if a supermarket has a loyalty card, then it has access to a shopping habits data base. By performing a cluster analysis, market analysts may stop speculating on market size, segments extents and features, or customers' needs and desires. Intelligent algorithmic systems perform profiles discrimination and sorts individuals into groups with common tastes, interests, priorities, buying power, sensitivity to discounts and price changes, by analyzing purchase histories. Then, dynamic market segments can be sized and prioritized, and different strategies can be followed to reach them.

Another current practice is the orientation towards the most profitable segments. *Adobe Target* is one of many tools designed to do that – it analyzes best clients using a software that finds out what they have in common, so users can know their target. It aggregates customer data from online and offline sources, including web and app analytics, databases of customer relationship management, and data warehouse systems. Then, machine-learning algorithms determine which variables are most predictive, eliminating irrelevant data (Sterne, 2018).

### **2.4.3. Sales Forecast**

Sales forecasting plays a core role in business strategy. Traditional forecast is generally performed with statistical methods, such as regression or moving average, yet these techniques have proved to be weak and ineffective. In fact, it is known that sales variability cannot be estimated by taking in consideration only the previous sales since these may vary widely due to internal and external factors (Kuo, Chi & Kao, 2002).

Lately, artificial neural networks (ANN) have been applied in sales forecasting as they manage to filter great volumes of data history in real time, being useful to monitor trends and recognize patterns. Besides, AI systems, relying on algorithms that consider multiple factors, allow companies to target prospects, realize sales opportunities and develop more accurate sales forecasts. In fact, the adoption of AI is expected to grow 139% over the next three years (Fatemi F., 2018).



A study was conducted in an IT company to compare the degrees of accuracy of traditional sales forecast techniques and the ones based on ANN. The forecast, performed following 3 different models – *Exponential Smoothing*, *Autoregressive Integrated Moving Average* (ARIMA) and an ANN system –, showed that the model based on ANN had a greater accuracy in predicting future sales (Sobreiro, Martinho & Pratas, 2018). Although the results need further research to be applied in broader contexts, it was verified that AI can provide a reliable instrument to support decision process by managers.

#### **2.4.4. Product and Services Innovation**

Innovation, the development and market launch of new products and services, is one of the most important issues in business research. By creating new products, innovation transforms existing markets and creates new ones (Hauser, Tellis, Griffin, & McAlister 2013).

The success of innovation relies on customers' acceptance, and, consequently, on customers preferences and needs. However, individual needs and tastes vary greatly from person to person, so it would be great managing to design customized products and services for each customer.

Therefore, providing customers with individually tailored brand experiences is a powerful marketing strategy to improve customer satisfaction by addressing specific needs and providing unique and personalized solutions (Kwon & Kim, 2012).

Advancements in information technology and artificial intelligence have enabled marketers to deploy more effective real-time and prolonged customer experience personalization tactics.

For example, Starbucks uses AI to recognize customers' mobile devices to have access to their ordering history, which enables baristas to make successful serving recommendations. In the music industry, the american music streaming service *Pandora* that uses algorithms to generate personalized playlists for each of its millions of users

according to their preferences in songs, artists and musical genres (Wilson & Daugherty, 2018).

#### **2.4.5. Pricing**

Recent advancements in AI technology has enabled the development of tools to track buying trends and create pricing strategies based on algorithms that adjust prices automatically, according to multiple factors.

In a market with heterogeneous tastes and different product valuations, companies may increase their profits by playing price differentiation (Wolk & Ebling, 2010). Operationalizing this requires a deep knowledge of consumer behaviors and buying patterns, in order to charge the maximum price each customer is willing to pay, enabling the extraction of additional consumer surplus.

There are three degrees of price differentiation (Tian, Qin & Liu, 2018): i) *Personalized pricing* – selling the same product at different prices to each buyer according to individual willingness to pay (e.g.: flight tickets); ii) *Product versioning* – creating a product line of slightly different products for the purpose of price differentiation (e.g.: premium versions); and iii) *Group pricing* – segmenting the market and offering the same price for each segment (e.g.: students discounts).

Dynamic pricing is a type of price discrimination that works on pricing products and services at the optimum price point, reviewing it often. With AI it is possible to find a customer's data patterns, which are unveiled by considering a variety of sources, such as loyalty cards and browser tracking systems, that are posteriorly analyzed using algorithms that cross that information with other factors such as competitors' pricing, consumer behavior, location, time of day, and seasonality to determine how much customers are willing to pay and how responsive they might be to special offers.

For example, a bank may use a pricing system to adapt deposit rate offers by observing customer's checking account activity. The algorithm, detecting flows between the bank and a secondary savings bank, can consider the nature of the customer's relationship with the bank, the expected revenues and the rate at the competing secondary bank to make an

attractive rate offer. By personalizing promotional offers in this way, the bank is able to get a higher rate of response from promotions.

On the other hand, some companies are taking advantage of great amounts of new data sources to improve the effectiveness of their pricing algorithms.

According Forbes Magazine (Ke W., 2018), Amazon's Privacy Notice page, suggests the retail giant collects and analyzes everything from purchase histories and products viewed or searched for to reviews, wish lists and duration of visits to certain pages. This huge pool of data on its customers' shopping habits can help Amazon better understand what shoppers are looking for, what they buy and what prices they are willing to pay.

Increasingly, managers are recognizing that a dynamic pricing strategy, supported by big data and AI, can help them creating a pricing advantage over competitors. In fact, this yield management has been practiced in businesses such as hotels or airlines for several years. Nevertheless, it is important to consider companies' overall strategy to assure that AI-powered pricing is aligned, and also to improve internal capabilities in data science to ensure the accuracy of predictive algorithms and avoid being over-taken by competitors.

#### **2.4.6. Advertising**

Nowadays, a significant part of advertisement campaigns is developed online. Along with e-shopping customer journey, artificial intelligence has helped advertising to take great steps, notably with regard to the customization of the campaigns. By aligning the content marketing strategy with data collected from customer searches and previous buying decisions, it is possible to optimize and deliver the most relevant contents to each customer.

A pertinent and easy to verify example happens when we search for a product in *Google*, and we can see that it immediately delivers suggestions of online stores that sell that specific product, normally shown in a special shopping box integrated into regular results. This system is called *Google Shopping*, and it delivers results whenever a shopping match is found, within the entities who bought this service from *Google*. Later, when navigating through different websites, especially social media, we will probably find adverts to that

same product. Despite not being too expensive to companies to apply, this data-based mechanism is extremely efficient because it advertises the exact products each person is looking for.

In 2018, Saatchi & Saatchi LA trained IBM's supercomputer, Watson, to write thousands of ads for Toyota's Mirai. First, Saatchi LA wrote 50 scripts based on location, behavioral insights and occupation data that explained the car's features to set up a structure for the campaign. The scripts were then used to train Watson so it could whip up thousands of pieces of copy that sounded like they were written by humans (Johnson L., 2017).

#### **2.4.7. Store Location**

Choosing a location in retail is a strategic decision with great impact in business success. Resident populations' age and buying power, pedestrian and automotive traffic flow, distance from competition stores and proximity to non-competitors magnet-stores are factors that contribute to store performance and must be considered (Karadeniz, M., 2009).

Location selection has conventionally been settled using systematic steps, such as checklists that enclose the different factors but disregard the relation between the decision factors globally.

Kuo J., Chi S. and Kao S. developed, in 2002, a decision-support system for location of a convenience store that comprised four components: 1) hierarchical structure development through fuzzy analytics and artificial neural network, 2) weights determination, 3) data collection, 4) decision making. This method considers multiple factors such as i) competition – hypermarkets, supermarkets and other convenient stores; ii) magnets – hospitals, hotels, restaurants, schools, banks, etc; iii) convenience facilities – parking, sidewalk width, road width, pedestrian walk proximity; iv) availability – crowd, stations, bus stops, traffic flow; v) store characteristics – visibility, front area, front width, door width; and vi) population characteristics – community size, income/consumption, population growth rate, population density.

This study confirmed that data manipulation procedures, allied with ANN methods permits notable advances in predicting the most convenient store location, contributing to greater success in business expansions. Perhaps, in the future, AI and machine learning frames could be developed to assist companies in internationalization decision-making.

#### **2.4.8. Store Experience**

Luminous panels with vibrant colors are not enough to get consumers' attention – they are getting savvier, more demanding and harder to impress (Begley, Fox, Lunawat & MacKenzie, 2018). Therefore, retailer points started to invite AI to selling points, taking store experience to a new level – from automatic service and interactive mobile apps, to augmented reality or smart mirrors and shelves, AI is taking big steps in bringing innovative systems to a wide variety of stores.

Several brands are already taking advantage of these technological innovations:

- Sephora makes it easier to find the perfect makeup without applying any product. Color IQ scans a customer's face and provides personalized recommendations for foundation and concealer shades, while Lip IQ does the same to help find the perfect shade of lipstick (in [www.sephora.com/color-iq](http://www.sephora.com/color-iq)).
- Lowe's, the american construction materials brand store, noticed customers had a hard time finding items and created Lowebot, an autonomous retail service robot designed to find products in multiple languages and help customers effectively navigate the store (in [www.lowesinnovationlabs.com/lowebot](http://www.lowesinnovationlabs.com/lowebot)).
- Convenience store 7-Eleven has been applying facial recognition in its 11.000 stores across Asia. The used system combines the technology with behavioral analytics to “identify loyalty members, analyze in-store traffic, monitor product levels, suggest products to customers, and even measure the emotions of customers as they walk around” (Chan, 2018).
- In South Korea, the International Finance Center Mall uses facial recognition into its information kiosks. Customers' age and gender are identified by cameras, so an intelligent system can personalize interactive advertisements accordingly.

Exciting environments supported by AI are beneficial for attracting customers, improving notoriety and increase sales. However, technology can help retailers in other ways, such as reducing costs, avoiding stock breaches, and increasing the efficiency of operations. An article published by *Mckinsey & Company* (2018) estimates that in a near future several tasks will be automated. Soon, most part of the core merchandising responsibilities at leading retailers could be almost entirely automated, such as merchandising planning and inventory, replenishment, and markdowns. This will have a positive impact in store-experience – on one side, shopkeeper will be free enough to provide a closer customer service – and – on the other side, and AI should drive processes more efficiently, avoiding, for example, stock disruptions.

#### **2.4.9. E-Commerce**

According to Statista website, in 2018, online sales represented 11,9% of total retail sales worldwide. Technological advances allow this number to grow every year, and AI has an import role in helping companies to meet customers' expectations, that value personalized experiences more than ever, efficient operations and fast answers to their needs (Enache M., 2018). In fact, there are several applications of AI that can benefit online stores.

For example, automated order and inventory management – by applying deep learning algorithms to forecast demand and shipping maps, it optimizes operations and drive sales efficiency. Plus, automated warehouses are equipped with robots that store and prepare orders 24/7. These perform a perfect inventory accounting and makes sure to warn the operation manager, if stock falls below the expected sales for the period before replenishment (Vincent, J., 2018).

*Intelligent Image Search* is technology that came to revolutionize web search world. Search engines are used to handle keyword searches, but AI makes it is easier to search by considering images. As customers examine product images on e-commerce sites, AI will examine its online path. By analyzing which images are opened, how long they are looked-at and related behaviors, AI can identify what that particular customer is looking for. A prime example of intelligent image searches is Pinterest. Then, e-commerce platforms adapted the same AI image search technology to get benefits such as increased sales, suggested close-matches that satisfy the customer, intelligent analysis of customer likes and dislikes and targeted email engagement based on image search history.

When our online shopping is ready, we often see recommended products showing. This recommendation engines work with big data treatment systems, that extracts insights about customer's purchase history, performed searches, and even general lifestyle can affect purchasing choices. Often, customers are interested in the suggested products which encourages them to return to the site and results in greater sales and improved customer experience. For example, Amazon reports that upselling and cross-selling is responsible for 35% of its total annual revenue (Cohn, C, 2015).

#### **2.4.10. Credit Risk**

For certain businesses, access to credit is a key aspect for prospects to become clients. Sectors such as real estate, automobile or even home appliances depend directly on banks' willingness to lend capital, or on the part of the selling companies themselves to defer revenue to a future moment, adjusting payment conditions. On the other hand, on corporations' side - banks or retail agents - the decision to lend or not to lend must be taken carefully, to avoid impairment losses and poor general results.

Several lenders are slowly taking advantage of predictive power of AI-based systems. In 2017, McKinsey released a report showing that machine learning may reduce credit losses by up to 10 per cent, while expecting credit decision times to fall by 25 to 50 per cent (Portilla, Vazquez, Harreis, Pancaldi, Rowshankish & Samandari, 2017).

According to *Intel AI Academy* (2018), AI scoring models resort to big data, including customers' credit history and buying profile, and works it with a wide variety of algorithmic and deep-learning mechanisms to improve credit decisions. Besides the significant reduction of costs by dismissing part of the human labor, these systems bring greater effectiveness through the continuously running combination of variables and predicting variables interactions.

For example, the american bank JPMorgan Chase introduced COIN, a contract intelligence platform that, resorts to machine learning to review about 12.000 annual commercial credit agreements in seconds (Galeon, 2017).

#### **2.4.11. Customer Service**

Customer service is of critical importance to a business because it is key to keep client's satisfaction levels and improve their loyalty. However, it is not easy for companies to provide personalized attention to customers, even when these actively try to contact organizations for support on product/service technical features.

To address this situation, automation of customer support has been registering a great development, being one of the most used AI applications in businesses. According to research by Oracle (2016), 78% businesses have either already jumped on the AI trend or are planning to adopt AI to better serve customers by 2020. In fact, according to Solomon (2018), customers are increasingly comfortable with automated services, as long as it is well designed.

An AI tool widely used for customer service is chatbots – computer programs designed to simulate conversations with human users over the Internet, providing the opportunity to engage with customers on a constant basis and rapidly respond to issues (Atwell & Shawar, 2007).

Chatbots help buyers searching for the right item, checking product availability, comparing multiple products and helping them to make the payment. Plus, it also helps organizations to connect customers with the appropriate service personnel in case of any complaints or queries. This tool is an effective and low-cost way of providing customer service since it creates a valuable CRM solution by adding a personal touch to the relationship between AI and customers, even without employing human workers. Amazon, Google, IBM, Microsoft, Oracle and Apple are some of companies that successfully implemented conversational computing platforms, that are designed to recognize patterns in consumers questions and comments, through voice and chat interactions (Koplowitz & Facemire, 2018)

#### **2.4.12. Customer Retention**

Managers strive to balance acquisition and retention efforts to maximize revenues and lifetime customer value. According to Reichheld (2001), increasing customer retention rates by 5% increases profits by 25% to 95%. However, several companies fail to address



products and services to customers' specific needs, which makes it difficult to promote engagement and keep customers loyal.

A research by Salesforce (2016) found that, by 2020, 57% of B2B customers will switch brands if a supplier company do not actively anticipate their needs. AI is key to enable managers to respond to market dynamics in real time, and address consumers' needs and preferences effectively and efficiently.

Noticing churn signs in advance is an important customer retention strategy. For example, having a CRM (customer relationship management) system that automatically sends emails if a customer does not make any purchase a certain period. Or, relying on a more sophisticated technology, it is possible to detect if a customer uses a search engine trying to get information about a competitors' product. In that case, AI system can decide on which messages should be delivered to prevent churn.

Besides, CMR systems can perform other automatic tasks to improve customer loyalty such as targeting customers with special offers based on data mining, reward the most profitable customers, or deliver personalized follow-up messages (Kulbyte, 2019).

### **3. Methodology**

The subject of the present dissertation can be considered complex, recent and is still in constant development. We are dealing with an exploratory study on the impacts that AI has on marketing, so we sought to resort to experts in the field, positioned at the forefront of all developments in the area. Their opinion, although exploratory, intuitive and only verifiable *a posteriori*, has a considerable probability of being valid and correct.

To perform an exploratory study of a constantly evolving reality it is mostly required a qualitative analysis, as the main objective is to gather in-depth opinions and insights on the topic and to answer the research questions presented in chapter 1.2.

To fulfill the proposal, a Delphi study was carried out, in this case a Real Time Delphi - a study that allows to gather a panel of participants on an online platform and pose them questions so they can answer and simultaneously interact with each other. The goal is for them to reach consensus on the issue, although this does not always happen.

#### **3.1. Delphi Method**

In the early 1960's, Olaf Helmer, Nicholas Rescher, Norman Dalkey, and other scholars developed Delphi technique, at the RAND Corporation, the "think tank" in Santa Mónica, California (Gordon, 1994). According to Hallowell & Gambatese (2010), the Delphi method is a systematic and interactive research procedure that seeks to obtain judgment by a panel of specialists on a given topic.

Therefore, before the execution of a Delphi test, the facilitator has to choose the experts. Regarding this topic, Adler & Ziglio (1996) defend there are four guidelines that should be transversal to any Delphi study – i) knowledge and experience with the issues under investigation; ii) capacity and willingness to participate; iii) sufficient time to participate in the Delphi; and, iv) effective communication skills.

After selecting all the elements of the panel, these are invited to participate in two or more rounds of structured surveys. After each round, the mediator reveals to the participants the inputs and opinions of the other experts, so that, in the subsequent round, participants can reflect on the responses of others and feel encouraged to review their previous responses.

Finally, the method concludes when the predefined number of rounds and/or the achievement of consensus is met. Afterwards the information taken should be statistically aggregated and analyzed to deliver the results.

Dalkey, N. (1963) argue that the main objective of Delphi is to “obtain the most reliable consensus of opinion of a group of experts [...] by a series of intensive questionnaires interspersed with controlled opinion feedback”.

Commonly, the Delphi technique is based on three principles: (1) anonymity; (2) controlled feedback of the information and knowledge contributions; and (3) statistical treatment of the group responses (Çipi, Llací & Ferreira, 2013)

The Delphi method is appropriate as a research system when there is incomplete knowledge about a problem or phenomenon (Skulmoski, Hartman & Krahn, 2007). Hence, the technique suits especially well when the main goal is to promote a better understanding of problems, opportunities, solutions, or to develop forecasts. Although reaching consensus is not necessarily the central objective of the study, by decreasing the variability of responses, it is possible to get nearer to the most correct judgement on an exploratory subject.

### **3.2. Real-time Delphi Method**

The conventional Delphi method presents some weaknesses, such as the long duration of the survey, the lack of real-time acknowledgment of results and the difficulty in tracking progress over time, which often led to experts drop-out. Besides that, the mediator tasks were complex, demanding and time-consuming (Gnatzy, Warth, Gracht, & Darkow, 2011).

Gordon & Peace (2006) developed an online approach to execute a Delphi survey that leaves out the sequential and fixed-duration rounds. Instead, as soon as each participant submits a response, it has access to the answers of the remaining panel. Thereby, the duration of each “round” and the complete Delphi test is shorted, and the respondents perceive a greater motivation to answer and a greater engagement with the test since the “reward” – average group results and respective comments on the questions – is

immediate. Besides that, this online technique promotes a greater conversation and exchange of judgements among the specialists, which leads to more accurate results.

In the figure below you can see the scheme of what was done following Real Time Delphi. As can be seen, after the questionnaire was formulated, the first round was held. Please note that comment viewing and analysis can be performed in real time as all interactions are automatically available. At the end of the last round it is possible to make the final results analysis.

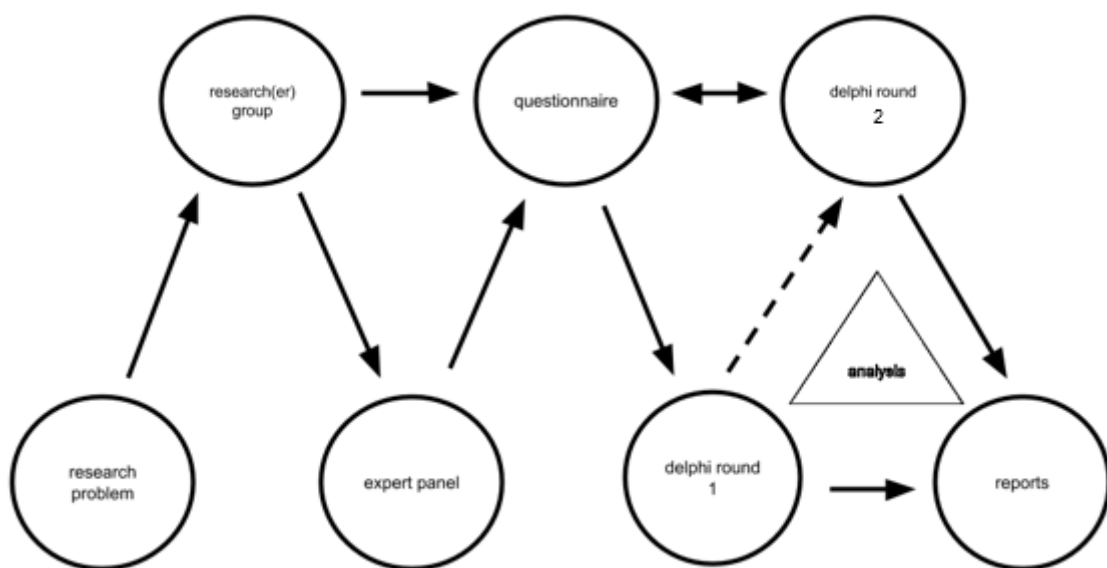


Figure 1: Real Time Delphi Diagram

### 3.3. Research Platform E-Delphi

One of the first steps in conducting this study was to search for a platform for performing the Real Time Delphi that would meet the required attributes: 1) allow the whole panel to see, in real time – not just the answers of each participant – but also the comments they had written; 2) it should be possible to perform more than one round; 3) free or at a symbolic cost and possibility to subscribe for only 3 months.

At the end of the research, we considered between two platforms - *E-delphi*, and *Welphi*. After an in-depth comparative analysis of both, we had to exclude the *Welphi* platform,

as, despite being graphically more appealing, it did not give due emphasis to the commenting action. For the molds we have set for the study we carry out, the experts comments are probably even more important than the score they attribute to the agreement scale in each statement - and in the case of this platform, this functionality came as a side action and did not have an effective call-to-action.

The E-delphi platform only had the drawback that it was slightly less attractive in terms of design, but functionally matched perfectly the objectives of the study. In the figure below it is possible to see an example of a question as it is seen on the Delphi platform.

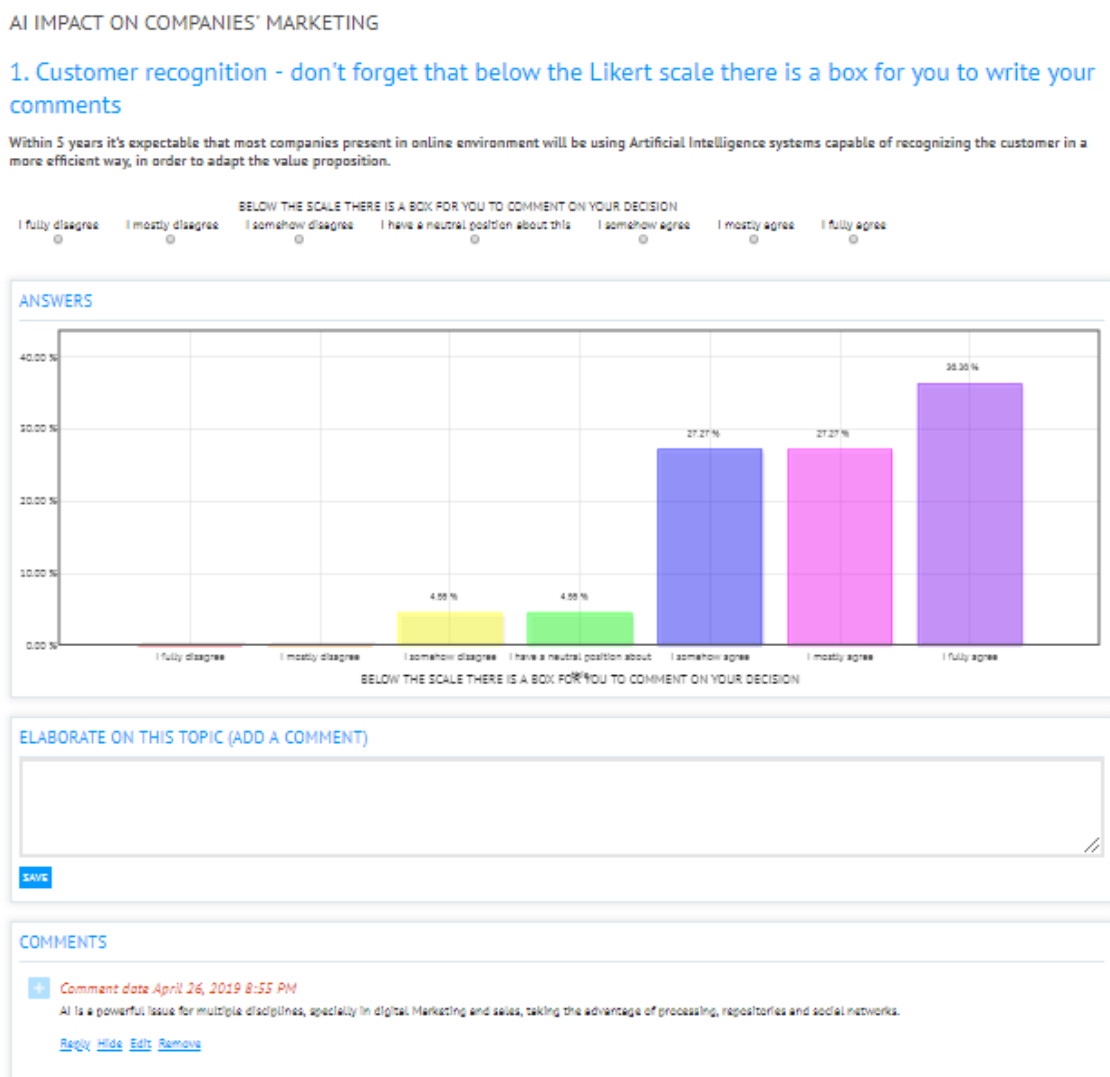


Figure 2: Example of a question, as seen in Delphi platform

### **3.4. Exploratory Interviews and Questions**

In an attempt to develop the most relevant research questions and to conduct the Delphi method as effectively as possible, we began by conducting exploratory interviews with subject experts. It was possible to interview four experts, which had cumulative knowledge about marketing, artificial intelligence and data science.

Ten questions were placed to the interviewees to guide the discussion:

- 1 – In the company you work for, what the areas in which AI is applied?
- 2 – What are the major questions posed to the AI activity applied to Marketing in 2019 in Portugal?
- 3 – Which areas of application of AI in Marketing are expected to register a greater development within 5 years?
- 4 – What are the main obstacles on the part of customers to the adoption of AI in Marketing nowadays?
- 5 – Who are the decision makers to adopt AI in business marketing in Portugal today? And internationally?
- 6 – What new business functions are emerging? Which companies had already implemented them?
- 7 – What would you like to know about the opinion of a group of national and international experts on the evolution of AI in marketing in the next 5 years?
- 8 – Who are the key international players in the development of AI solutions applied to marketing? And at the national level?
- 9 – What are the most common AI solutions at the moment?
- 10 – What are the investment values (price) for standard solutions?

The answers were distinct among the interviewees, but a few insights about the current state of artificial intelligence application in marketing emerged, and so did ideas on the future applications to be explored in the Delphi study – **a) in a near future (5 years), several marketing areas are expected to be severely impacted by AI development**, such as segmentation, sales forecast, personalization and automatic content creation; **b) the main obstacles to AI systems adoption are the perceived value of the investment and the internal resources** to know how to follow the project; **c) The main deciders on the task of implementing AI systems are general managers and marketing directors.** IT department often participate in the strategic decision, but only to advise and never to decide; **d) new jobs are arising and gaining popularity – data scientist, data analyst, machine learning engineer and analytic translator** are increasingly popular functions among companies of several sectors; **e) the interviewees mentioned that the main issues they would like to see answered by a panel of experts** concerned, on the one hand, issues **directly related to the business and marketing strategy** – how will the impact of AI in various marketing areas, reorganization of the work, what tasks will actually be performed by intelligent robots, if AI will be able to have creativity and participate in strategy, which solutions might be implemented for automatic marketing processes (segmentation, customer service, pricing, communication) - and, on the other hand, a **strong interest in exploring ethical issues** - for example, if a company uses chatbots, it should notify the interlocutor that it is interacting with a smart robot, whether or not it is ethically correct to carry out sentiment analyzes and dynamic prices, or if practices are too invasive.

### 3.5. Research Statements

Given the broad spectrum of AI's utilities for marketing, a very exhaustive study was carried out, which included the themes proposed by the interviewed experts as well as other issues that were considered relevant. Thus, several marketing topics were covered throughout this study, which consisted of 17 sentences, that were meant to be evaluated in an agreement scale (from 1- fully disagree to 7- fully agree) and commented by each participant.

One of the most relevant topics for marketing is the issue of customer recognition, and how AI can be a facilitating tool in this process. Thus, the first research statement is: **S1**

**– Within 5 years it's expectable that most companies present in online environment will be using Artificial Intelligence systems capable of recognizing the customer in a more efficient way, in order to adapt the value proposition.**

Some of the interviewees mentioned the importance of market segmentation and how AI and machine learning are already taking relevant steps in building segmentation systems useful to marketing, and so the second question arose: **S2 – Market segmentation systems, according to the history-based accuracy degree (machine learning), will be dominant in medium and large enterprises in the next 5 years.**

Sales forecasting has always been one of the key processes that determine the success of a product strategy. Since machine learning systems are increasingly competent in analyzing and creating algorithms that consider many different variables, the third statement related to this topic – **S3: Within 5 years, AI systems are expected to be able to execute sales predictions with a considerably higher accuracy than current ones.**

AI technology is already taking important steps towards increasing the effectiveness of dynamic pricing, by customer recognition and buying historical analysis (Ke W., 2018). However, ethical considerations should be taken. Therefore, the fourth idea relates to the impact of AI systems in pricing – **S4: In 5 years, the measurement of the target audience purchasing power (income brackets) to better adjust the price (and the features) of products or services will be dominant.**

One of the areas of marketing that has undergone the greatest advances and changes arising from AI is communication. Communication, especially online communication, is becoming more personalized, and customer recognition can improve the relationship between the customer and the company by guiding a more effective and efficient communication. Therefore, the two following sentences concerned to this marketing-mix variable – communication: **S5: Programmatic advertising (a system for optimizing the purchase of online advertising space between agencies and publishers without human intervention on a case-by-case basis) will become dominant in online advertising in the next 2 years; S6: In 5 years, most company internet websites will be developed by deep learning systems, allowing for real-time adjustments in design and content to optimize for Search Engine Optimization.**



One of the applications of AI that has been most impressive, both for experts and outsiders, is the Internet of Things. Although it is possible to take advantage of these systems both in companies and in homes, there is no widespread usage (Rossmann, Batut, Thieullent, Brosset, Chemin, Buvat,..., Hein, 2018). As such, the seventh question lies on this topic – **S7: Automatic purchasing systems (systems which, based on parameters defined by the customer, will buy autonomously) will become common, both for consumer goods (B2C) or to re-supply in the retail area (B2B).**

One of the main revolutions facilitated by the technology of the last years was the proliferation of chatbots. These automated customer care tools have brought several benefits and cost savings to organizations, as it has been changing their relationship with consumers. On the consumers side, it had been registered different attitudes regarding chatbots (Galert, 2017) – although some clients are already used and positive about chatbots due to its efficiency, 24/7 availability and advanced software's, others still prefer the traditional human technical assistance even if it implies waiting several hours or even days. Therefore, the Delphi study comprises four questions related to this important topic of chatbots, considering the evolution and development prospects, attitudes towards automated response systems, without neglecting the inherent ethics – **S8: Within 2 years, companies will use Artificial Intelligence systems based on Natural Language Processing in their contact centers, allowing customers to choose how they want to contact the company and how they want to receive a reply – either by writing or by voice; S9: AI can be used to improve customer service standards by adjusting channeling towards chatbots or human responses in a machine learning process; S10: When a particular site uses chatbots to mediate interactions with customers, these should be informed that their interlocutor is a robot; S11: Human Vs Bot: Using chatbots leads to a decrease in the credibility of a company's customer service.**

Despite artificial intelligence being associated with technology, internet, and online acting, brick & mortar business can also benefit from smart applications. In this regard, we have sought to listen to experts on possible developments in this area. **S12: Offline businesses can also benefit from AI, through a systematic tracking of indicators such as location of individual mobile phones, correlations between weather data and sales, number of passers-by, and sales.**

The automation of tasks is one of the core appliances of AI, and the change of the human resources management in companies is a natural result of its development. Some say several jobs will disappear, resulting in massive rates of unemployment and leading to the uselessness of human labor, while others claim that the automation of tasks will only create different job positions that require a human factor and strategy skills. Since this subject is so relevant to many, the specialists were asked to give their opinion on this topic through two sentences to reflect on – **S13: In the coming years, we will face a change in the roles of the Marketing and Sales teams because most of the operations (especially the more routine ones – market analysis, trend identification, credit risk analysis...) will be executed by robots; S14: Within 5 years, robots will be used not only at the operational level, but also in the definition of strategies and even planning and goal-setting.**

The new AI-based technologies allow the collection of a much larger volume of data than what is done by traditional systems. However, it is also expected that excessively privacy invasive systems will be created, and therefore that data protection laws of all countries will become a constraint on companies' freedom to collect data. In this sense, we approach the experts to understand what the trends will be in the coming years on this topic. **S15: Privacy and data protection laws (General Data Protection Regulation) in the European Union and the USA will be an important limitation for the potential of AI for Marketing (for example, in market research and customer recognition).**

Finally, one of the most debated topics in the exploratory interviews was the ethical concerns of artificial intelligence. As such, we have reserved the last two questions to address this issue. **S16: Deep changes, mainly positive, are expected to happen IN SOCIETY, arising from technological advances and Artificial Intelligence, in the next 5 years. (Considering the various aspects of human life – health, education, comfort, security, economic well-being, etc.); S17: There is an urgent need to clearly regulate the development of AI systems in areas like transparency, explanation of all functionalities, capabilities and purposes.**

### **3.6. Sample and Survey Process**

For this study we gathered a sample of 21 participants, all of them experts in marketing and/or in artificial intelligence. 13 were Portuguese and 8 were foreign from different countries (USA, Canada, Macau and Korea), most of them associated with universities or top-level managers.

After the required tests to assure everything was working perfectly, invitations were sent, the final version of the questionnaire was inserted in the platform and Real-Time Delphi started.

The first round began on April 26 and lasted 15 days, during which the participants were able to express their opinions on the questions raised. At the end of the first round an e-mail summarizing the replies was sent, as well as a note on which issues the opinions were most diverging from so that they would return to them more carefully and openly.

In the second round there was a lot of debate, plenty of responses to outside comments and several edited answers. This lasted 19 days, plus 4 days of extension. The round ended in June 2.

## 4. Analysis of Results

In this chapter the results of the Real-Time Delphi are presented and analyzed. Therefore, this chapter is divided according to each research topic and, within each subchapter, we find the results for the corresponding questions of the survey.

As mentioned in the methodology chapter, the participants were asked to analyze 17 questions to later express their agreement through a likert scale (from 1 to 7).

For the purpose of verifying the exploratory veracity of each statement, in this case, it was considered that when the average of the answers was 5.5 (out of 7) or higher, the veracity of the statements would be **verified**.

If the level of agreement is between 4.5 and 5.5, the research question would be **partially verified**, while lower values of average agreement would be associated with **inconclusive** statements.

### 4.1. Impact of AI on Customer Recognition

Statement 1: *“Within 5 years it’s expectable that most companies present in online environment will be using Artificial Intelligence systems capable of recognizing the customer in a more efficient way, in order to adapt the value proposition.”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 22 responses, was **5,86**. On average, experts considered they *“mostly agree”* to the presented sentence, even though the most frequently registered answer was *“fully agree”*.

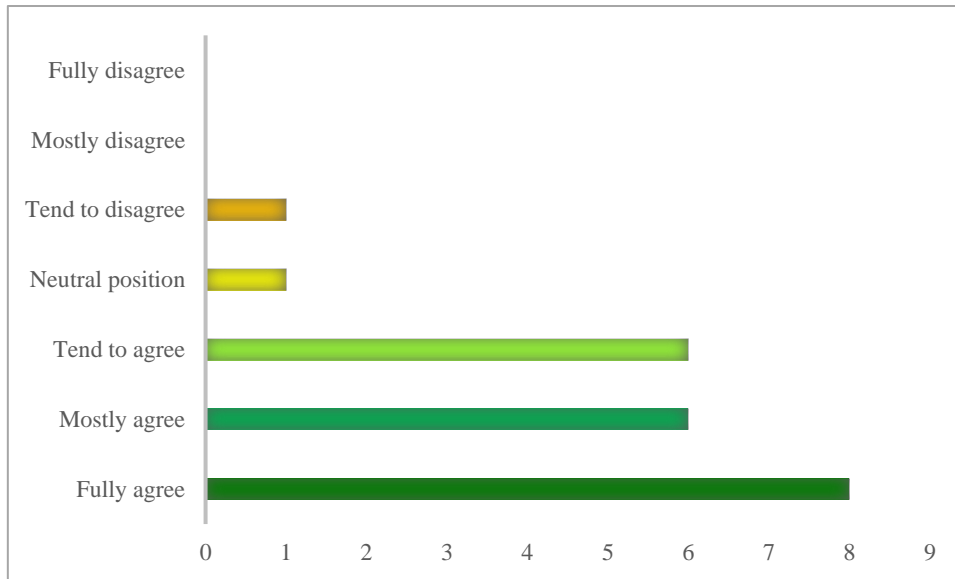


Figure 3: Specialists Agreement on Statement 1 – Regarding the Impact of AI on Customer Recognition

Most specialists assigned maximum score to this exploratory sentence.

“I fully agree because AI algorithms will be democratized in several areas and solutions, specially the ones where there is a lot of data. As of today many online companies already use real time recommendation capabilities as well as more advanced customer profiling.”

“I totally agree because the most common tools are already using some AI, in 5 years this will definitely be a reality. Taking into consideration paid media (social media, search...) or organic solutions (website analytics, email marketing, CRM...)”

Most experts who “mostly agree” to the given sentence pointed out that the usage of Artificial Intelligence and Machine Learning to recognize customers would always depend on the type and size of company.

“AI’s adoption will diverge mostly around the size and access to processing and other computing resources (...). Nevertheless, there will be some democratization around it and, after some hype in the upcoming two to three years, we will have some more productive applications that will drive a more widespread adoption. “

“To be clear, I think that most of the \*volume\* of transactions will be mediated by some sort of AI, but there will still be many smaller businesses who will have not yet embraced this technology.

Also, some experts stated they “tend to agree”, even though they identified limitations to the usage of customer recognition systems.

“The impact of AI systems is very dependent on how consumer, product, and contextual information is coded and analyzed. When systems are able to represent constellations of consumer needs that change in salience as a function of time, location and stimulus conditions, then retailers selling a broad range of merchandise can more effectively tailor the presentation of products, prices and messages to connect with customers.”

“Most companies will aim at recognizing the preferences and habits of their users to provide personalized services. Nevertheless, many companies deal with products and services that do not require frequent interactions, and many others will not have enough information about the users to be able to personalize the services.”

A few participants pointed out critical obstacles, and do not see

“(…) User privacy can be a challenge for businesses in the next few years.”

“Personalization, 1-to-1 marketing, CRM, etc have been going on more than decades. However, what at best most online companies would do, is mainly about recommendation by popular or similar products; applications collaborative filtering do exist but relatively rare. Mainly users concern about privacy, login/password effectively helps a site recognizes who is who. Recommenders though popular, somehow has peaked. There isn't really much innovative improvement in recent years. Therefore, I doubt AI could make any significant breakthrough in the future five years. AI may enhance recommendations making prediction and matching more precise. Other than that, it is a compromise between usability's and convenience by the privacy concerns.”

## 4.2. Impact of AI on Market Segmentation

Statement 2: “Market segmentation systems, according to the history-based accuracy degree (machine learning), will be dominant in medium and large enterprises in the next 5 years.”

From a scale of 1 to 7 – in which 1 stands for fully disagree, and 7 stands for fully agree – the average result, based on 22 responses, was **6,18**. Therefore, on average, experts considered they “mostly agree” to the presented sentence, although the most frequently registered answer was “fully agree”.

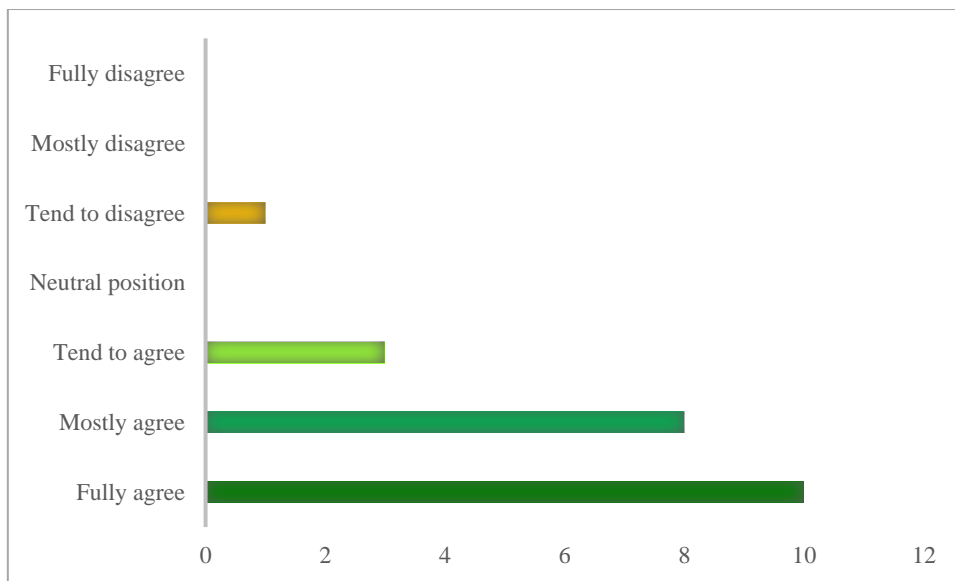


Figure 4: Specialists Agreement on Statement 3 - Regarding the Impact of AI in Market Segmentation

Most experts believe artificial intelligence will perform a major role in market segmentation, due to two main reasons – data explosion and increased sophistication and accessibility of the AI driven segmentation software’s.

“B2B businesses are already doing it on many cases since top CRM platforms allow capturing a lot of relevant data and are integrated with marketing automation tools powered with AI; B2C business will also join this trend either because sales will continue shifting to e-commerce (that also allows to capture many relevant data) and available 3rd party data is exploding in the market.”

“Segmentation systems are performing already on a very positive record for most B2B and some B2C companies. In the upcoming years, I anticipate that the main change will be in B2C with more data and, mostly, the use of AI's powered assistants to use the insights gathered from the segmentation tools and make them more accessible to the human in charge.”

“In general data mining data analytics mature. Applications are more inclined to have the machine learning abilities for market segmentation. It is becoming increasingly popular and affordable comparing today and the past decade.”

However, according to experts, some constraints arise:

“I believe this is applicable for all B2C fairly sophisticated big and mid-sized companies, but there are still many companies afraid of deciding their approach to digitalization.”

“(…) [AI segmentation systems] are generally based on supervised models and must be fed with huge loads of data both on behavioral and also success moment (to train the supervision) and this data collection is very challenging for many companies”

Also, the models used to teach the machines should be carefully considered and tested to avoid mistakes:

“Machine learning including deep learning is so sensitive to the models used and the data used for training. For example, if ML used the Bag of Words model then we will have very general statistics.”

### **4.3. Impact of AI on Sales Forecast**

Statement 3: *“Within 5 years, AI systems are expected to be able to execute sales predictions with a considerably higher accuracy than current ones.”*

From a scale of 1 to 7 – in which 1 stands for fully disagree, and 7 stands for fully agree – the average result, based on 22 responses, was **6,18**.



Therefore, on average, experts considered they “mostly agree” to the presented sentence.

The most frequently registered answer was, once again, “fully agree”.

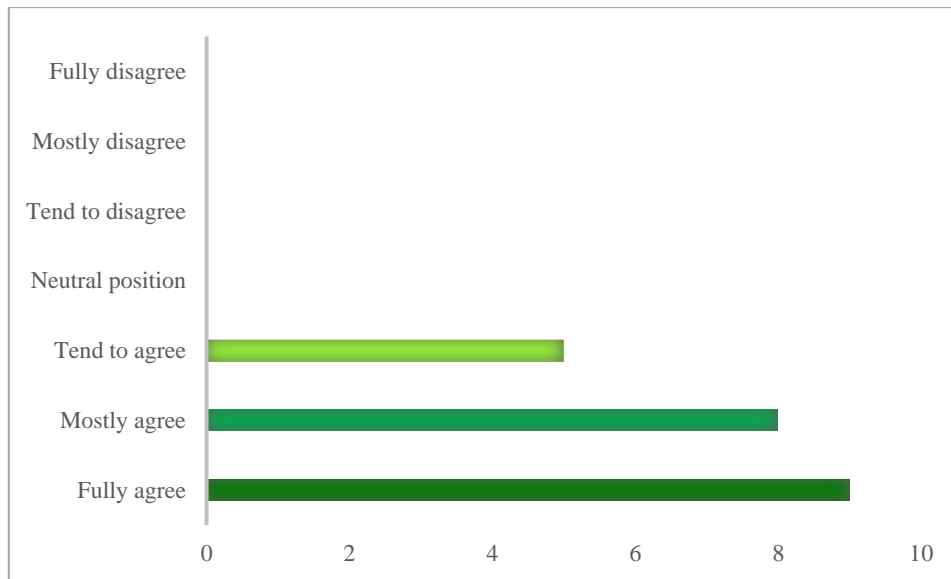


Figure 5: Specialists Agreement on Statement 3 – Regarding de Impact of AI on Sales Forecast

Regarding the evolution of the usage of AI in sales forecasting, the opinions of the experts converge, and we verified experts believe that AI will promote the accuracy of the systems. Once more, data proliferation identified as a major facilitator.

“The capability of aggregate data from different sources of AI systems will definitely execute more accurate predictions.”

“As the data source become more complete and timelier, the performance of predictive models will only increase.”

“By allying i) the increased data piled on CRM systems, with ii) the improvements on algorithms and all machine learning related mechanisms and iii) acquisition of 3rd party data available, will surely allow improvements on sales prediction accuracy”

Some experts point out the need to monitor external factors and tendencies, instead of relying only on sales history.

“Sales behaviors are often influenced by external factors and data that are difficult to collect and include in a machine learning model, but with the increase of data and processing power and efficient machine learning algorithms, it may be possible to reach higher accuracy.”

“The problem is that the evolving context requires companies to incorporate data from external online sources such as social media, and I still don't see companies to invest enough on this issue, even though some are betting on it.”

#### **4.4. Impact of AI on Price Management**

Statement 4: *“In 5 years, the measurement of the target audience purchasing power (income brackets) to better adjust the price (and the features) of products or services will be dominant.”*

From a scale of 1 to 7 – in which 1 stands for fully disagree, and 7 stands for fully agree – the average result, based on 22 responses, was **4,68**. Therefore, on average, experts considered they *“tend to agree”* to the presented sentence, even though the most frequently registered answers were *“I have a neutral position about this”*, *“tend to agree”* and *“mostly agree” (ex aequo)*.

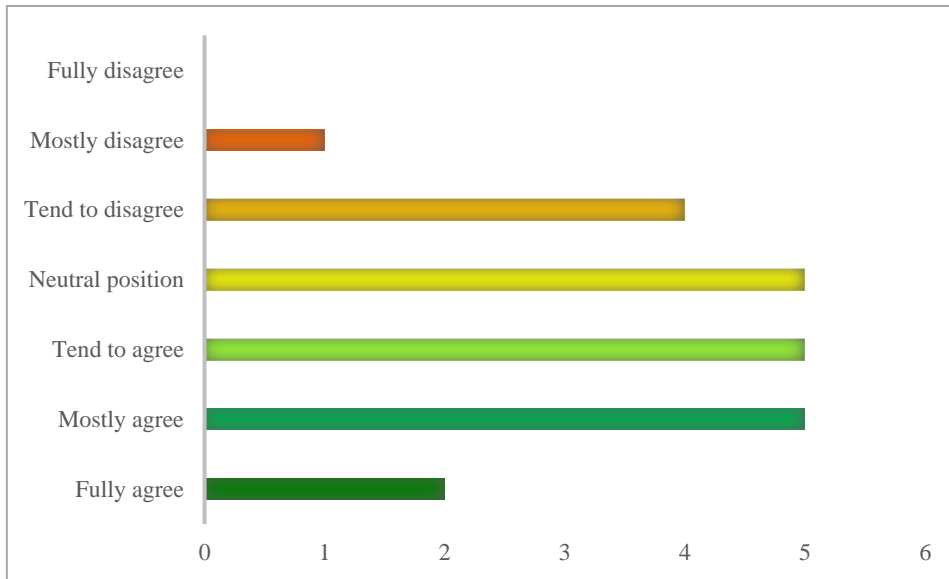


Figure 6: Specialists Agreement on Statement 4 – Regarding de Impact of AI on Price Management

The positions regarding the measurement of purchasing power through AI systems are very disparate. On one hand, we have the infinite possibilities that AI and ML promise to attain.

“That is so possible because there are so many smart techniques that are collecting data on every step of the customer journey. It includes a variety of smart sensors that can pick every change in the customer behaviors including gestures.”

“I fully agree, because digital technology of sensors and displays will make possible the adjustment of price in real time according with customer preferences and habits.”

Several participants demonstrated their agreement regarding AI improving customer knowledge but pointed out some reservations about the usage of technology to reach personalized price.

“Using AI tools to classify customers through market segmentation (whether to assess buying-behavior or perceive purchasing power) can be of great help. As for

the way those market segmentation results are used to adjust prices or features of products it's definitely attainable but not necessarily the best use of this kind of AI technology”

“I have my doubts that AI's can accurately predict the value given for a situation to be used extensively due to the lack of data in B2C and more complex processes in B2B.

More advanced companies will be able to get a good notion of what each consumer values and will begin a new era of mass personalization.

We will begin the path towards personalized value delivery and management, but the main bottleneck will be human: most companies aren't prepared to such a change in the mindset or don't have relevant data on the needed 360° view of the consumer, as well regulation and privacy laws will limit the potential”

“Most companies still need to attain a higher degree of maturity to go from market segmentation to individual pricing prediction.”

Besides, regulation and privacy laws are expected to restrict the appliance of AI in individualized pricing.

“It is hard to tell when it will be dominant because these capabilities are, in most cases, highly indexed to privacy laws and regulations, which today point in a closing trend, but might change to a more balanced position in the future.”

Also, the usage of recognition and tracking systems for the purpose of price adjustments may be seen as condemnable strategies by the clients themselves, who will soon disguise companies who perform it.

“The open nature of the online world ensures that personalized pricing is named and shamed when it happens. This is a definite technical ability that will be a marketplace loser.”

## 4.5. Impact of AI on Communication Management

### 4.5.1. Programmatic Advertising

Statement 5: “*Programmatic advertising (a system for optimizing the purchase of online advertising space between agencies and publishers without human intervention on a case-by-case basis) will become dominant in online advertising in the next 2 years.*”

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **5,86**. Therefore, on average, experts considered they “mostly agree” to the presented sentence, and the most frequently registered answer was “mostly agree”.

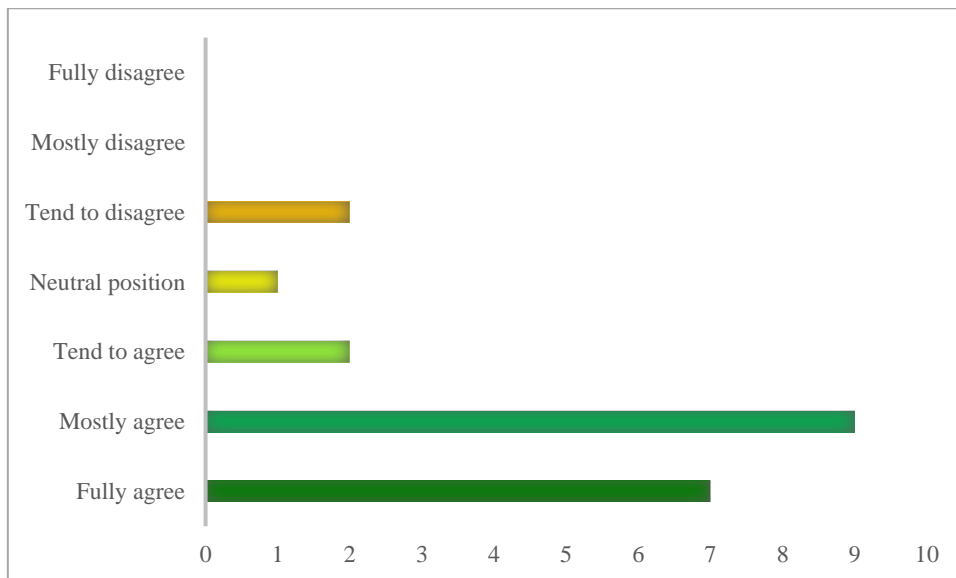


Figure 7: Specialists Agreement on Statement 5 – Regarding de Impact of AI on Programmatic Advertising

Most experts agree that programmatic advertising is a trend that has revolutionized marketing and promises to follow the digital evolution bringing positive results.

“This a reality today for the big advertisers, media buying is a commodity currently and revenue for agencies most come from services. What I believe is

that programmatic [advertising] as we know it today will change a lot, meaning, the ability to automatically buy media space will improve with some new features but the big change will come from medium and formats available as the merger between physical and digital increases; an example just to help explain my point: TV being mostly watched on mobile/tablet or pc (as expected to happen in a very near future) added to the "2nd screen" trend gives the brand a new set of very valuable options only doable with lots of data and powerful tech serving real time decisions executed automatically following pre-defined rules set by the advertiser”.

“I agree if we consider the broader definition of programmatic which includes Facebook, search, display in *Google Display Network*, because the DSP [demand-side platform]<sup>1</sup> will not be available for small businesses since it has a high entrance fee”.

“Programmatic at scale will consolidate and achieve a maturity stage and will spread to other media like TV. The challenge is to integrate systems and communications and to have a clear set of objectives for the campaigns”.

Some have mentioned that the success and evolution of programmatic advertising is depends on the development of other areas

“I think it depends on the evolution of data analytics and segmentation.”

The ad-blocking software’s and functionalities might constitute a challenge to online communication.

It is true that AI can be used to improve the way personalized ads are delivered directly to the user, but considering that online-advertising is being challenged (even fought) by ad-blocking technology (at the browser level), it is difficult to assert that this kind of tool will actually have a guaranteed future.

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<sup>1</sup> A demand-side platform (DSP) is a system that allows buyers of digital advertising inventory to manage multiple ad exchange and data exchange accounts through one interface.

#### 4.5.2. Websites Development

Statement 6: *“In 5 years, most company internet websites will be developed by deep learning systems, allowing for real-time adjustments in design and content to optimize for Search Engine Optimization.”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **3,95**. Therefore, on average, experts considered they “have a neutral position about this” to the presented sentence, even though the most frequently registered answer was “*tend to agree*”.

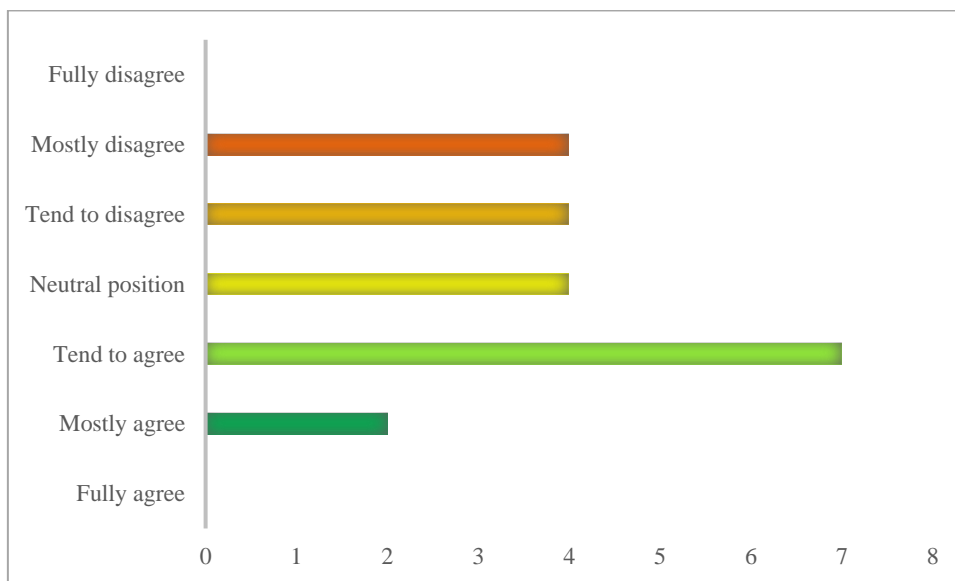


Figure 8: Specialists Agreement on Statement 6 – Regarding de Impact of AI on Websites Development.

Generally, specialists are not sure that deep learning will have a significant impact in web development and performance of real-time adjustments, and they present several reasons for this lack of confidence.

The costs associated may keep small and medium companies from acquiring these systems.

“The cost-benefit for this implementation will delay the adoption of this technology.”

“The main problem is that in Europe and US most companies are SMB (not different from the rest of the world) and most of these co's don't have the resources nor the need for these "real-time adjustments". I expect that the leading platforms used to develop these websites (like *WordPress* and others) start including these types of capabilities but I'm not very optimistic on co's actually start using them on the next 5 years.

“Real-time adjustments will occur, but not necessarily with deep learning. Also, I believe that small and medium companies don't have the resources (nor the need) for real-time adjustments.”

“The use of personalized elements in the communication and websites will be a reality, but brands still will have to inspire and be true to their central idea and have to inspire consumers. So, not everything can and should be not customized. We will have some customization, but it will be limited due to the costs involved and the need for significative data volumes, making it less accessible and feasible (or even necessary) for SME's”

Others believe deep learning systems are still in an early stage of development and still have much to prove before they are implemented in scale to work autonomously.

“Using deep learning for website content management is a task only at the reach of R&D teams, and most companies are (and will be) still short on this valuable asset.”

“Deep learning is mostly experimental with lots of scholars playing with Matlab or PyTorch. Reality requires integrating websites to deep learning algorithms to see how effective, robust and scalable they can be. That need to be seen first.”

However, some agreed with the statement and have demonstrated confidence in deep learning mechanisms.

“I agree since, thorough the next years, machine learning algorithms could learn on more data, making available stronger supervised learning algorithms. Taking



advantage of strong processing capabilities is a present challenge, then, we can expect a deep progress in that.”

#### 4.6. Impact of AI on Internet of Things

Statement 7: “Automatic purchasing systems (systems which, based on parameters defined by the customer, will buy autonomously) will become common, both for consumer goods (B2C) or to re-supply in the retail area (B2B).”

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **5,43**. Therefore, on average, experts considered they “*tend to agree*” to the presented sentence, and the most frequently registered answer was “*tend to agree*”.

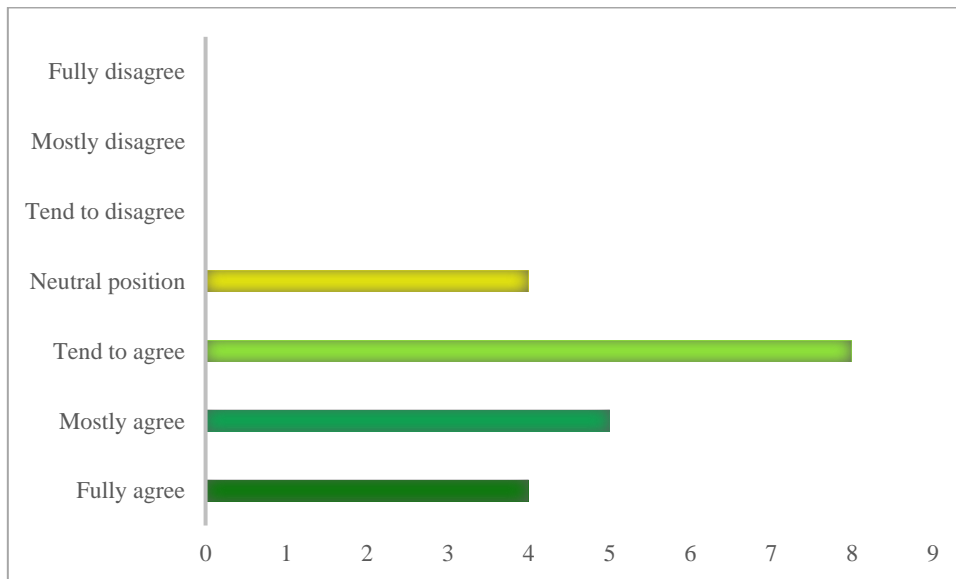


Figure 9: Specialists Agreement on Statement 7 – Regarding de Impact of AI on the Development of Internet of Things

Several experts have demonstrated their full agreement with the idea that automatic purchasing systems will become increasingly popular in both B2B and B2C.

“ERP [*Enterprise Resource Planning*] uses such automatic purchasing systems and ERP will be better with the blockchain technology. That is why I am 100% confident.”

“This will definitely happen. When? Tough to say.”

“In B2B I expect that re-supply (already common in some areas and industries) will keep growing; in B2C I believe that most "little to no differentiated" categories will move to the subscription model (many examples are now real and growing all over the world in many retailers). This is accelerated by millennials' shopping behavior which will become the majority of shoppers in the next years.”

For B2B, [...] supply chain management systems and procurement software's are evolving to become more intelligent by using machine learning and AI. Any company which provides such solution is gearing towards the direction of making the work and workflows more intelligent using machine learning.”

“I believe that subscription models and automatic replenishment will become more common as customers seek buying efficiencies and companies attempt to create inertia and loyalty.”

Most experts prospect that automatic purchase systems will be common in B2B, but not so successful for consumer goods.

“This will be almost certainly true for B2B, but hard to believe that will happen in B2C.”

“In consumer goods I don't believe that a significant part of the population would authorize an automatic purchase of groceries. Problems with the special events, routines, interest in selecting their favorite products, and lack of trust will not permit this. For business, I am sure that many of them will do it.”

"Yes, with the rise of learning personal assistants and voice interfaces, but not in a such a widespread use in B2C.

It will be a niche thing for the innovators and more wealthy and non-kinetic ones.”

“In B2B this seems likely, but there will be some restrictions on the consumer side in terms of trust on these systems.”

## 4.7. Impact of AI on Customer Service

### 4.7.1. Natural Language Processing

Statement 8: “*Within 2 years, companies will use Artificial Intelligence systems based on Natural Language Processing in their contact centers, allowing customers to choose how they want to contact the company and how they want to receive a reply – either by writing or by voice.*”

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **5,33**. So, on average, experts considered they “*tend agree*” to the presented sentence, even though the most frequently registered answer was “*mostly agree*”.

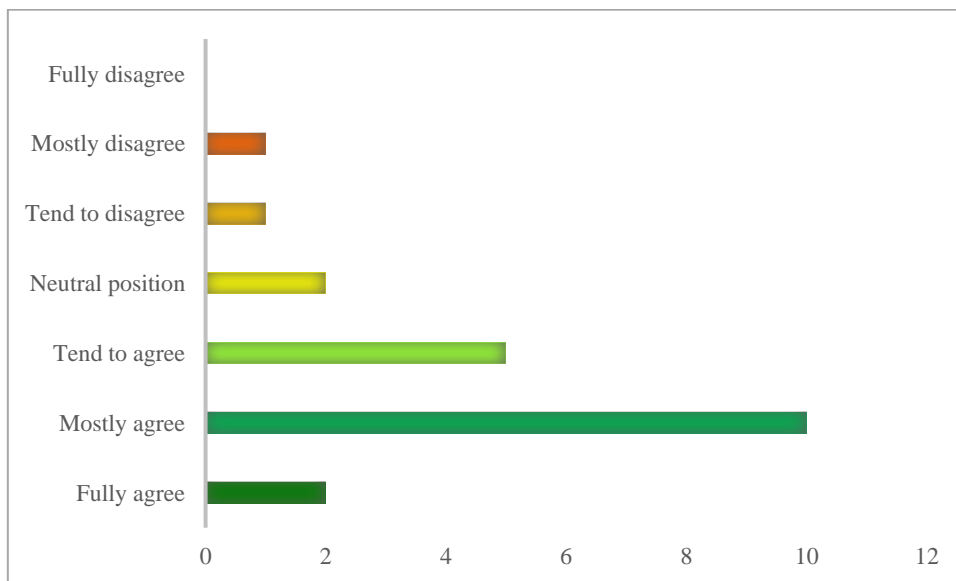


Figure 10: Specialists Agreement on Statement 8 – Regarding de Impact of AI on Natural Language Processing

The majority of discussants claimed to believe that in a near future customer will be supported by intelligent systems based on Natural Language Processing.

“It's already real, even though a lot of improvements are coming specially in voice powered tools”

“Communication can be improved that is clear. And now technology can help.”

“Some will be slow to take advantage but as the ease of implementation improves, it will be detrimental to ignore.”

One of the challenges inherent to this type of technology is interpreting messages that are not so simple for machines to learn, such as figures of speech and rhetoric, which are used more frequently at the level of orality.

“Communicating based on NLP with customers is mission DONE. However, understanding the conversations automatically is still a challenge.”

“NPL is improving but there are major challenges related to the power of cognition systems can achieve.”

In addition, certain languages are particularly difficult to process (and difficult to teach to AI-based intelligent systems), so, if the market is not large enough, it may not be profitable to create systems tailored to certain countries.

“Companies are already deploying it, the difficulty is "just" the learning behind non-English languages. Translating is not difficult - real time interpretation and translation - is available, the challenge is to understand the intention behind it.”

“Portugal can be a later adoption since voice recognition is based on language and accent and Portugal is a very small market to be cost effective to adapt locally this technology.”

However, some have pointed out that intelligent NLP processing is still in a very early stage of development.

“Nevertheless, despite the recent advances in NLP, processing natural language in a proper way is much more complicated than most people think. I think that in specific tasks and domains a chatbot will provide full customer support; in others they will just help human agents to prepare their answers.

“This is still a subject on its infancy, further heavy research is needed for this to become a reality. There are several difficulties, starting on the language itself.”

#### 4.7.2. Channeling Adjusting - Towards Chatbots or Human Responses

Statement 9: *“AI can be used to improve customer service standards by adjusting channeling towards chatbots or human responses in a machine learning process.”*

From a scale of 1 to 7 – in which 1 stands for fully disagree, and 7 stands for fully agree – the average result, based on 21 responses, was 5,86. Therefore, on average, experts considered they *“mostly agree”* to the presented sentence. However, the most frequently registered answer was *“fully agree”*.

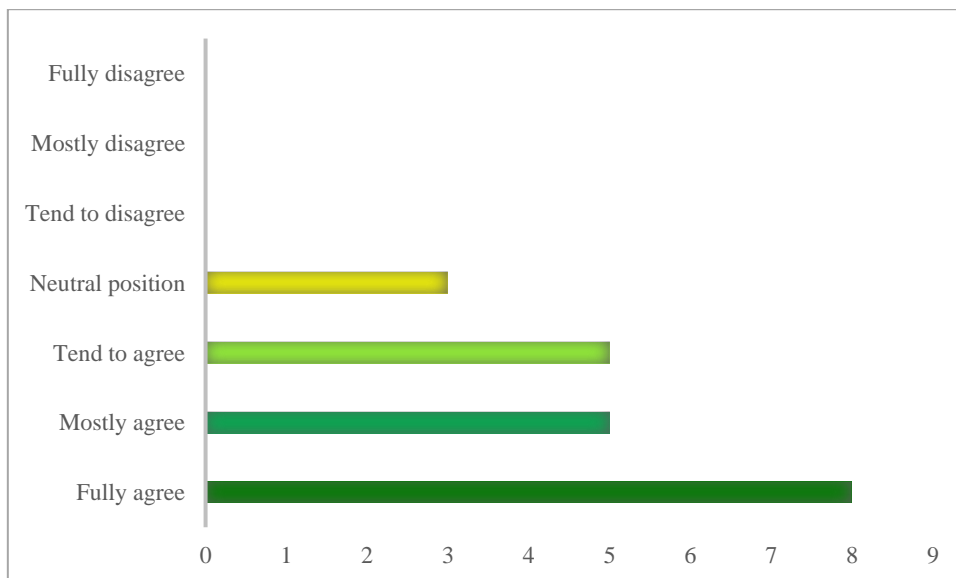


Figure 11: Specialists Agreement on Statement 9 – Regarding de Impact of AI on Chatbots vs Human Responses

The answers and comments to this question do not show a significant deviation. In general, participants responded that they agree that AI can be a useful tool to enhance client relationship and service by channeling interactions to robot or human assistants depending on the objectives of each interaction.

“AI is going to be very helpful to help humans in customer service.”

“ [...] AI is also useful to help determine when (on which stage of the conversation) is better to switch the channel; for many issues starting a conversation with a bot and then moving to a human, or the reverse, may be the best customer experience”

“It is part of an adjustment of the value proposition to the customer and it will be a natural move for first interactions and channel selection”

Nevertheless, some have mentioned that the technology may not be sufficiently improved to function autonomously

“Chatbots have long history since ELIZA, however, we need great power of ML (like using IBM Watson) to develop an effective smart chatbot.”

“[Chatbots] can be effective to a level by engaging customers but the road is not that clear if they can be convincing.”

#### **4.7.3. Ethical Considerations of Chatbots**

Statement 10: *“When a particular site uses chatbots to mediate interactions with customers, these should be informed that their interlocutor is a robot.”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **5,10**. Thus, on average, experts considered they “*tend to agree*” to the presented sentence, although the most frequently registered answer was “*fully agree*”.

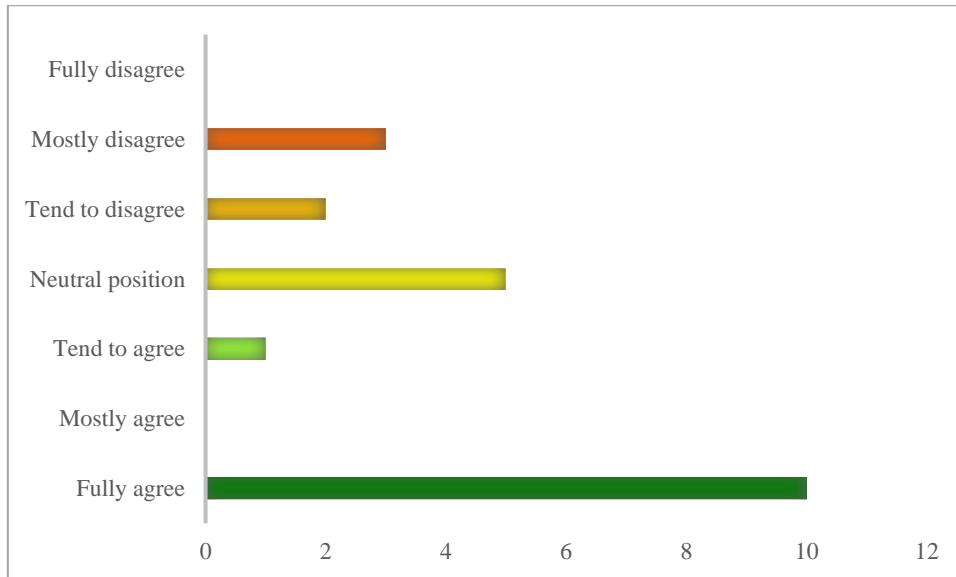


Figure 12: Specialists Agreement on Statement 10 – Regarding de Impact of AI on Ethical Considerations of Chatbots

Despite believing in the effectiveness of chatbots, most experts fully agree that transparency regarding the intelligence of the interlocutor (artificial / human) is imperative in order to achieve a customer service that is not only efficient, but also ethically correct.

“I don't see any problem with the use of bots. But informing will improve trust.”

“I fully agree, besides ethical imperative, customer care wise in most cases users don't mind to chat with a bot (it is even faster) but they would like to know and also have the capability to talk to a human if needed.”

“Sure, but just for a matter of transparency which I find critical for all businesses. Most chatbot conversations are yet more like a dynamic way to use the good old FAQ's than real conversations. And even without disclosing it I think most people easily recognize when they "chatbotting" instead of chatting with a human. But as said before transparency has no downsides.”

Some even pointed out negative outcomes that could arise from not disclosing such information.

“We are living in the era of radical transparency. I agree with some discussants when they refer that consumer will just want to have their problem solved - this will be the main driver. Nevertheless, they should be informed and have the option to choose the level of human participation in the process, even if at a cost. Otherwise, companies will lack the confidence and empathy that will drive deeper engagement. Once they have the experience with automated channels, they would naturally adopt the most fitting ones.

On the other hand, some discussants argue they don't find it relevant to introduce a chatbot as an artificial agent, since they believe the client is not interested in this information, but only in obtaining clarification for the subject that motivated the contact

“For simple interaction when you ask for an information, I don't think it is necessary. However, when are more complex questions, especially regarding billing or complaints clients must be aware that it is a robot and give them the possibility to talk with a person but bearing in mind that instead of having an answer now it will take more time. “

“I believe people will just want to see their problem resolved or question answered, so it's difficult to ascertain if knowing what's on the other side will make a difference.”

“Normally it is clear that it is a robot because of their type of automatic responses, it does not matter to the customer, who just want to have his/her problem solved.”

#### **4.7.4. Chatbots Credibility**

Statement 11: *“Human Vs Bot: Using chatbots leads to a decrease in the credibility of a company's customer service.”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **3,14**. Therefore, on average, experts



considered they “*tend to disagree*” to the presented sentence, and the most frequently registered answer was “*fully disagree*”.

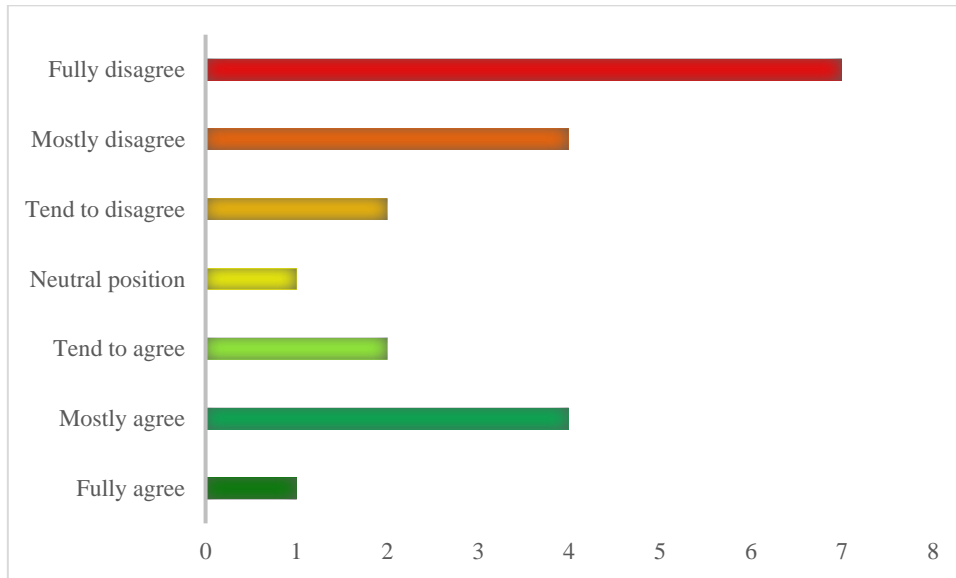


Figure 13: Specialists Agreement on Statement 11 – Regarding de Impact of AI on Chatbots Credibility

The opinions on this subject were very disparate. Analyzing the scores attributed in the Likert scale, we found that, throughout the study, this was the statement that registered a greater standard deviation.

On one side, we have those who argue that customer service mediated by a chatbot leads to a loss of credibility in the solution and information transmitted. The main reason cited is because the stage of development of this technology is not yet sufficiently improved to be able to function autonomously.

Chatbots require further refinement for complex customer queries, and often become a barrier to accessing human assistance.

From my experience that [credibility loss] happens mainly due to poor "human" specs / implementation, not because of the technology itself.

Currently this happens as the quality isn't yet good enough.

Not sure that removing the human aspect is good advertising. Of course, if it reduces the waiting time and the resolution of problems then that is good publicity.

Others defend that chatbots are absolutely credible and trustworthy, and for certain types of customer service it might be the best possible solution, overcoming human interlocutors.

“Using chatbot doesn't mean it is less credible. It is just automation. Automation and credibility are independent.”

“If the chatbot is meaningful and 24/7 available as well as able to provide advice and service in time, then it will enhance the credibility of the company.”

“If it is well done shouldn't be a problem, the robot can be adapted to have a more personal conversation and if it solves the client problems and does it quicker, it should improve and not damage the consumers perception of the company customer service.”

“I have complete faith in a bot telling me what time the store closes, the flight departs, or the movie starts. We will discover that some questions are better answered by a bot than a human.”

We also noted that several experts have a more neutral view on this issue and argue that the credibility of a chatbot depends on the effectiveness of its programming.

Well that is a very unclear issue. That all depend how smart and useful these chatbots to customers. If we are using those boring usefulness chatbots then we will end in killing the business.

It's true that people have a disdain for chatbots but that is mostly because of current day implementations of chatbots that are not yet fully developed to have a human-like level of conversation, but I tend to believe that this will be different in the future, especially for basic queries.

#### 4.8. Impact of AI on Offline Businesses

Statement 12: *“Offline businesses can also benefit from AI, through a systematic tracking of indicators such as location of individual mobile phones, correlations between weather data and sales, number of passers-by, and sales.”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **6,48**. So, on average, experts considered they *“mostly agree”* to the presented sentence, and the most frequently registered answer was *“fully agree”*.

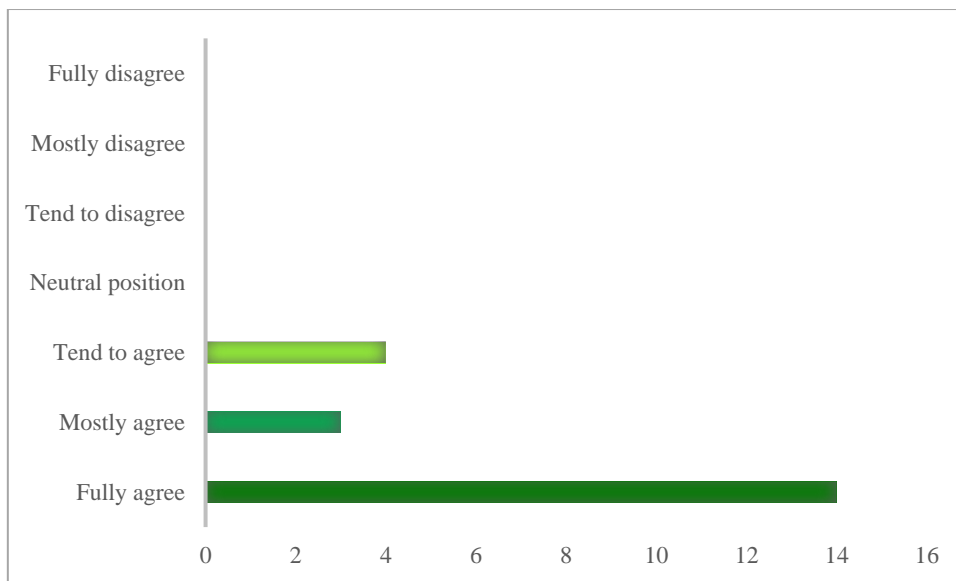


Figure 14: Specialists Agreement on Statement 12 – Regarding de Impact of AI on Offline Businesses

All panelists demonstrated agreement with this statement.

“All business generate data, all data can be treated, AI is a powerful tool to put data serving business so AI can help business no matter if they are online or offline. Want an example? Just look retailers' loyalty programs. Club Card (and all the others) grab and use a lot of data, where do you think most of it come from? B&M cashiers or e-commerce platforms? I'd say the first just by looking to each side's volume shares.”

“Sales alone can provide an enormously rich source of information that, through AI, can help optimizing pricing, assortment, shelf space management, promotions, etc.”

“The more information the better. The problem sometimes is to have too much information and don't get insights but that is something that AI can also help us.”

## 4.9. Impact of AI on Labor

### 4.9.1. Marketing and Sales Teams

Statement 13: *“In the coming years, we will face a change in the roles of the Marketing and Sales teams because most of the operations (especially the more routine ones – market analysis, trend identification, credit risk analysis...) will be executed by robots.”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **5,67**. Therefore, on average, experts considered they *“mostly agree”* to the presented sentence, and the most frequently registered answer was also *“mostly agree”*.

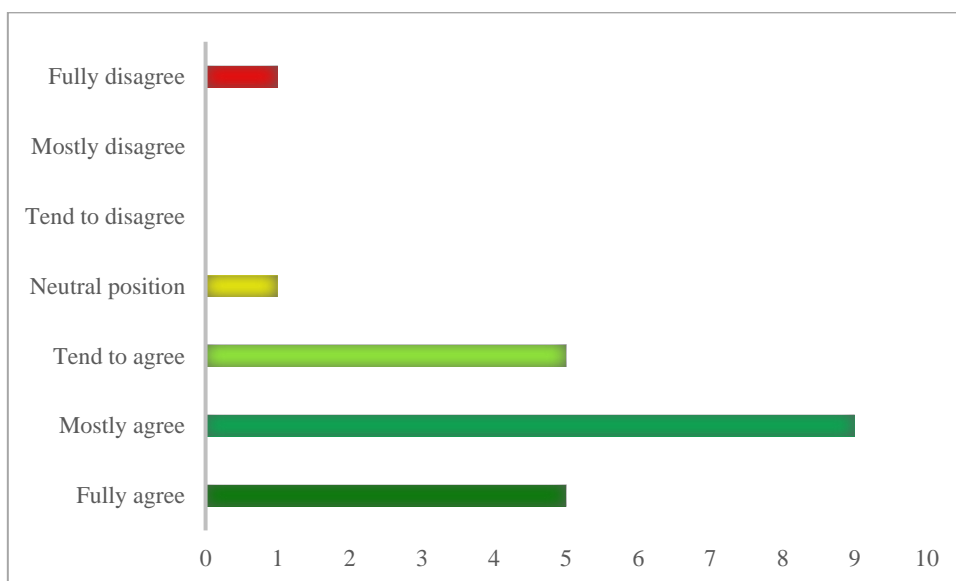


Figure 15: Specialists Agreement on Statement 13 – Regarding de Impact of AI on Marketing and Sales Teams

Most experts agreed that most routine tasks will be performed by robots in the overcoming years. Although many agree labor structures will change, they argue it will not necessarily conduct to dismissals and unemployment.

“I fully agree. The most routine operations will be done automatically by robots or other AI systems”

“That is not a bad thing if these robots are designed carefully. It might kill many current jobs, but it is for the better. New jobs will be created with the new smart environment.”

“We should not be talking about "job-killing robots" but should be focused in what can humans do with the time gained by AI automation? About 35% of the tasks can be automated and humans will have an assistant to their (other) decisions - augmented (human) intelligence. And what about the new jobs to be created?”

Others suggest that robots may constitute a threat to human employment.

“The roles will be tremendously assisted by automation.”

“The impact of AI in society, and in particular in the "job killing" area, will definitely be relevant. But as someone said before, "if a robot can do a human's job faster and better, then it is the human that is stealing the human's job". Humans should use the advantage that robots introduce (by executing menial and repetitive tasks) to focus on the other areas in which robots cannot excel.”

#### **4.9.2. Strategy and Planning**

Statement 14: *“Within 5 years, robots will be used not only at the operational level, but also in the definition of strategies and even planning and goal setting.”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **3,62**. Therefore, on average, experts considered they “*have a neutral position*” about the presented sentence, although the most frequently registered answer was “*tend to agree*”.

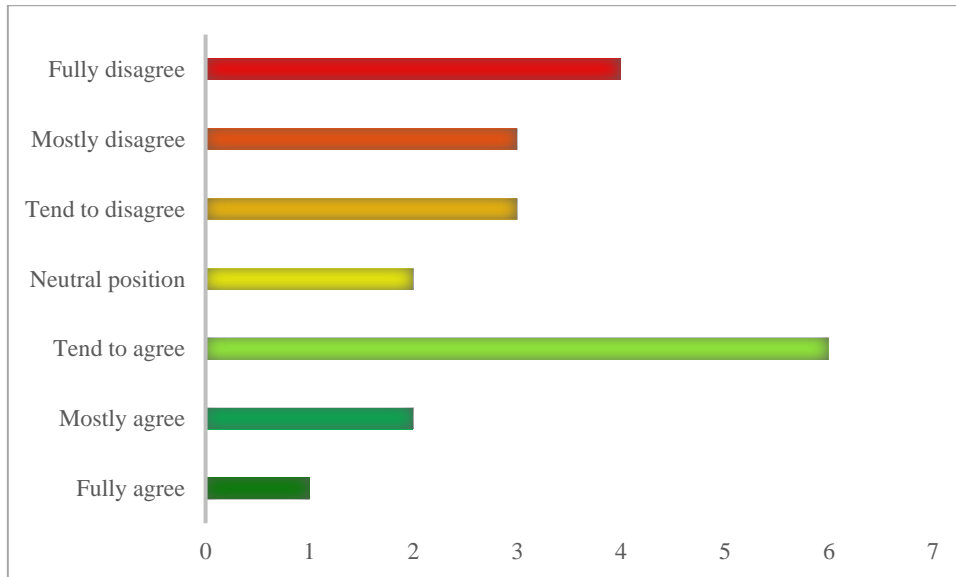


Figure 16: Specialists Agreement on Statement 14 – Regarding de Impact of AI on Strategy and Planning

Most panelists agree that artificial intelligent systems will not replace human labor in strategy definition, even though they might constitute a great help at analysis and planning.

“Will not take over to define strategies or even planning or goal-setting but will definitely assist.”

“In the next five years I expect to see them being a lot more useful to generate relevant and high-quality data used by humans to actually define strategies and goals. Decisions will continue to be made by humans.”

“I somehow agree, because they will be able to get the best information about success and failures in previous strategies implemented. Nevertheless, the human feeling and instinct is needed.”

“Robots are great at menial and repetitive tasks, but not so good at human-analytical level. It's my belief that the human role in strategy and decision making will be empowered by robots, not replaced.”

“It will not be used in the definition but as a support tool for the definition but is the human factor that will make the difference. We are talking to people and we want to touch the audience and be relevant and meaningful and it is important to have an human thinking and validating the data.”

Some experts emphasize that strategy definition is a hard task for robots as they are nowadays.

“Policy making and decision making based on planning is a complex paradigm. It requires very smart blackboard that have great intelligence to communicate with multiple knowledge sources and do the links and identify patterns and formulate a planning map.”

“Planning and defining strategies is challenging even with very powerful AI infrastructures.”

There are some comments that demonstrate strong disagreement with the idea that artificial intelligence will have a significant impact in in roles of strategy, which imply not only analysis but also creativity, discernment and risks consideration.

“What are we considering as robots? We are still far from giving machines the human general intelligence needed to do that, especially because they most work on historical data and lack the kind of creative and disruptive human thinking.”

“For planning yes. For strategy and goal-setting it is too farfetched. Machines are not creative.”

“The use of AI for fully automated strategic decisions will not be a reality anytime soon. This is because a real environment is a really complex one and an AI system will not be able to encompass all the needed variables and adapt by incorporating information from different sources.”

“I believe strategy definition should never be taken by a machine for a couple of reasons:

(i) business is not chess (the set of rules to do the right business decisions is not only mathematics);

(ii) deep learning models are improving but their food is information and we don't have enough structured information to feed a model to make holistic business decisions;

(iii) ethics: extreme example: should a machine decide to fire someone? should it decide to fire or hire new CEO. Of course a very smart system should give a board the needed Business Intelligence to do the right decisions;

(iv) legal: most of the strategic decisions must and should be held by a board and this is healthy and safer.”

#### **4.10. Impact of AI on Privacy and Data Policy**

Statement 15: *“Privacy and data protection laws (General Data Protection Regulation) in the European Union and the USA will be an important limitation for the potential of AI for Marketing (for example, in market research and customer recognition).”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **4,71**. Therefore, on average, experts considered they *“tend to agree”* to the presented sentence, and the most frequently registered answer was *“tend to agree”*.



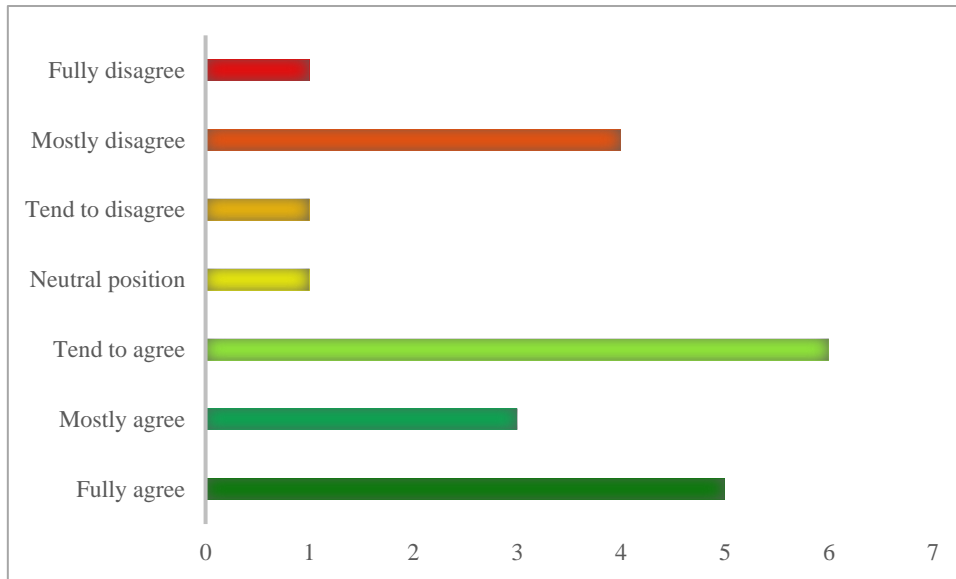


Figure 17: Specialists Agreement on Statement 15 – Regarding de Impact of AI on Privacy and Data Policy

Once again, the opinions regarding this topic vary widely.

Several participants agreed that GDPR and other regulations may, somehow limit the potential of AI, but recognize this is important for data security and privacy purposes.

“Regulation can limit AI's potential, but regulation is needed to avoid excessive behaviors and promote virtuous behaviors in companies that must be prepared to reward consumers for their data.”

“It will limit it's potential, it is already doing it but everything will evolve, [...] but the regulation must also evolve to guarantee the customers rights and information safety.”

“They limit the potential but protect trust, which is critical for the success of AI projects.”

Some have mentioned that regulation will not have such a significant impact since, on one hand, customers and web-searchers will become more condescending about giving permission for accessing to personal information and data, and, on the other hand, companies themselves will take in consideration ethics and will not try obtain information

that consumers do not want to provide (even if it is only for of safeguarding the reputation)

“I expect to see consumers become more available to give their consent once this "GDPR early days" end. And companies will also become more used to comply with these laws and new strategies will surely appear.”

“In general, most people are willing to trade-off some privacy for the comfort of a better online experience, but if the current trend of privacy regulation maintains, there may be an impact in the way AI tools can operate”

“Beyond regulation, we will focus on company's reputation, purpose and ethics before trusting our data - we must have "ethics by design" embed in every AI deployment.”

“I somehow agree, but people are able to consent data use if they find a purpose and a benefit on sharing data. And AI for marketing will give benefits for customers.”

Also, it was mentioned that even if they create regulation that limits the action of AI, companies have found other ways of accessing data.

“We just need to get creative.”

“Regulations can protect the source of data, though not the algorithms and research.”

“ [...] AI will find ways to solve the challenges.”

## **4.11. Impact of AI on Ethics and Society**

### **4.11.1. Changes in Society**

Statement 16: *“Deep changes, mainly positive, are expected to happen IN SOCIETY, arising from technological advances and Artificial Intelligence, in the*

*next 5 years. (Considering the various aspects of human life – health, education, comfort, security, economic well-being, etc.)”*

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **5,86**. Therefore, on average, experts considered they “*mostly agree*” to the presented sentence. Also, the most frequently registered answer was “*mostly agree*”.

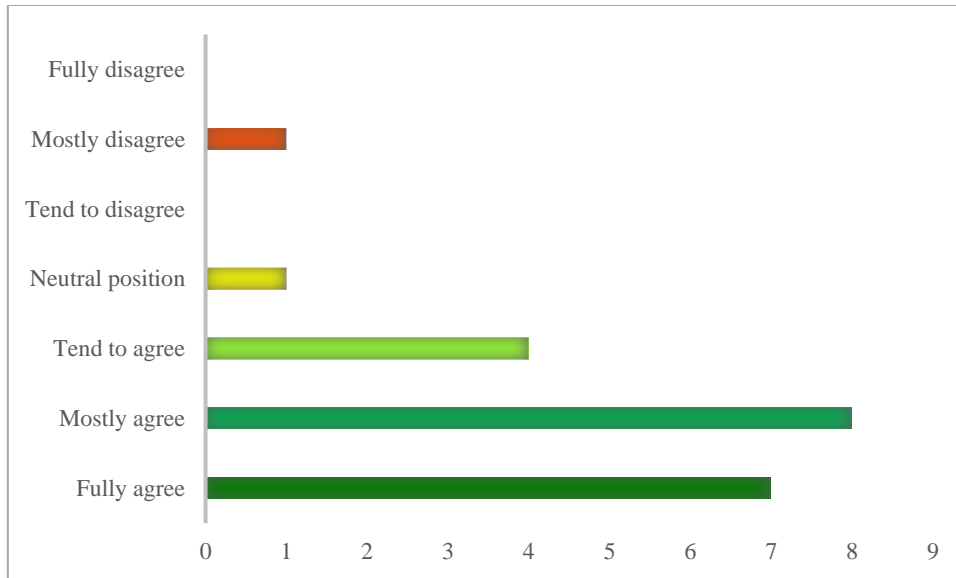


Figure 18: Specialists Agreement on Statement 16 – Regarding de Impact of AI on the Expected Changes in Society

Generally, the panelists agreed that AI will bring very significant changes to the society, although most do not foresee mainly positive changes.

“The coming changes in the society is going to be massive. Job styles will change dramatically as the increase use of robots.”

“For sure many of our habits will change.”

“I hope most changes will be positive, but I’m sure we will see many shocking things.”

“Changes will be strongly produced as it always has happened in the history of humanity. They will be positive or negative, we will see in the future.”

Some have mentioned that 5 years is a too short time horizon for radical changes to be noticed.

“I believe the most challenging and impactful changes will occur in a decade or more, not in 5 years [...].”

“The visible and spread impact will take their time and widespread adoption will be slower than we think. We will see great benefits but to be noticed and *escape* the *bad* news around AI and job losses, we will have to wait for more than 5 years. We are still far from the 15% adoption step that will drive society to a new stage of evolution, but I understand that, as every human phenomena, we are living some hype of inflated expectations.”

Moreover, specialists have pointed out ethical and sustainable concerns, both to society and environment, that should follow technological revolution.

“I fully agree but the agents of this innovation and the regulators must be very wise and ethical.”

“If guided towards the common good, which means intervention and guidance from local authorities.”

“People will be more aware of their impact in environment, for example, and being more conscious will lead to more responsible behaviors. And technology will help us to be easier and cheaper to be a better citizen and think more in the future.”

#### **4.11.2. AI Systems Regulation**

Statement 17: “*There is an urgent need to clearly regulate the development of AI systems in areas like transparency, explanation of all functionalities, capabilities and purposes.*”

From a scale of 1 to 7 – in which 1 stands for *fully disagree*, and 7 stands for *fully agree* – the average result, based on 21 responses, was **5,62**. So, on average, experts considered

they “mostly agree” to the presented sentence, and the most frequently registered answer was “fully agree”.

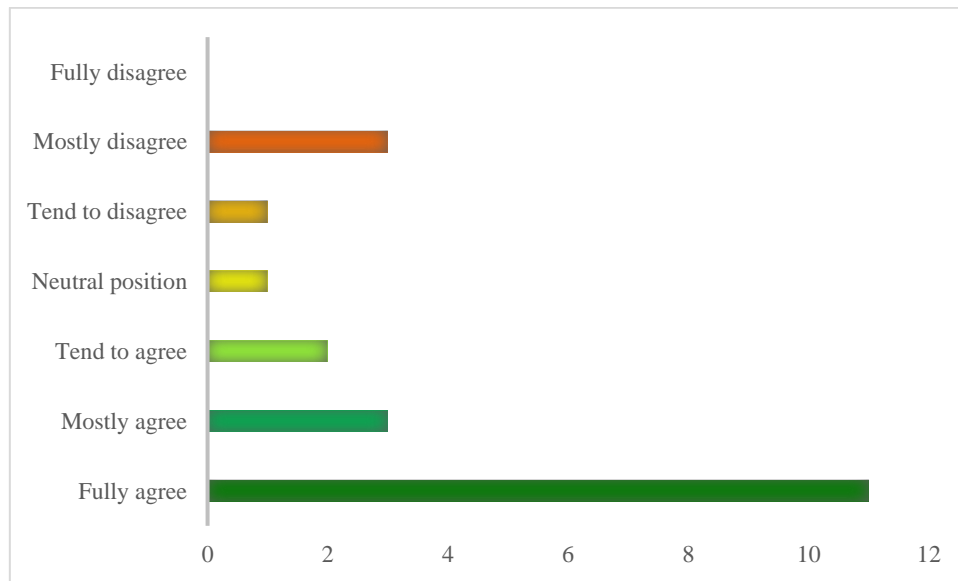


Figure 19: Specialists Agreement on Statement 17 – Regarding de Impact of AI on AI Systems Regulation

Most participants attributed the maximum score on the agreement scale regarding this statement, which reveals that regulations and laws that mediate and control AI activities is an important subject that should be on the agenda of regulatory authorities.

“AI must be treated like any strategic field. It must be regulated. Engineers need to have very strong certification and rules of conduct. Unfortunately, we regulate medical doctors, engineers but nothing like that with the AI and software development in general.”

“Safety must come first. Regulations pave the safety way.”

“This is a must to have. This includes Regulating Smart Devices, Regulating AI jobs, Ethics and Practice.”

“There are too many new things happening (new jobs, new facilities, etc.) due to AI. We really need to regulate it. Each day, each one of us have access to more sophisticated technologies, which can be used with negligence and/or bad intentions.”

Some have mentioned that just some fields and applications of AI development need imperative regulation.

“There is an urgent need to clearly regulate the development of AI system in critical areas (eg. military, mission critical systems, etc.). But, most likely, only to come to the conclusion that most efforts to do that will be void.”

Some have written comments that might constitute important alerts.

“The problem is that people who are making the laws and regulation are not aware of the total potential of these tools, and this technology is evolving very quickly which is hard to the regulation be up-to-date”

Furthermore, the distinction between regulating what is created versus what is used has arisen.

“The use yes, the development no.”

“Regulations are not necessary in development, but in the use of data sources and ways of use of the algorithms. For example, a given algorithm on a social study cannot be equally applied in Europe or South America. Any country, government or whatever institution should regulate the application as not to get biased results.”

However, this idea was refuted.

“I do not agree with separating development from other AI phases. Simply if we do not regulate how functionality are to be developed, we will end into making an AI that is vulnerable to several breaches then we will cry after that on making AI safe systems!”

## 5. Conclusion

In the last chapter we will go through the main conclusions of the study carried out.

Thus, this chapter is intended to bridge the objectives initially proposed and the results of the study, and to understand to what extent the conclusions are useful for the theory and practice of marketing and business management.

### 5.1. Summary of Results

Within the various topics addressed and the different questions posed to the expert panel, there was disparity in the average degree of agreement.

For the purpose of verifying the exploratory veracity of each statement, in this case, it was considered that when the average of the answers was 5.5 (out of 7) or higher, the veracity of the statements would be **verified**.

If the level of agreement is between 4.5 and 5.5, the research question would be **partially verified**, while lower values of average agreement would be associated with **inconclusive** statements.

Most of the topics were presented to the panel through a single question, but there were cases where several questions were raised on the same topic, and it was found that during the study some were validated, and some were not. As such, we consider the issues individually, regardless of the topic.

In total, there were 9 statements that were **verified** by the panel, which concerned to the expectation of AI's contribution to the development of the following marketing areas - customer recognition, market segmentation, sales forecasting, program advertising, channeling, offline businesses, labor impact on marketing departments, and also ethics considerations, such as changes in society and regulation of AI:

S1: “Within 5 years it’s expectable that most companies present in online environment will be using Artificial Intelligence systems capable of recognizing the customer in a more efficient way, in order to adapt the value proposition.”

S2: “Market segmentation systems, according to the history-based accuracy degree (machine learning), will be dominant in medium and large enterprises in the next 5 years.”

S3: “Within 5 years, AI systems are expected to be able to execute sales predictions with a considerably higher accuracy than current ones.”

S5: “Programmatic advertising (a system for optimizing the purchase of online advertising space between agencies and publishers without human intervention on a case-by-case basis) will become dominant in online advertising in the next 2 years.”

S9: “AI can be used to improve customer service standards by adjusting channeling towards chatbots or human responses in a machine learning process.”

S12: “Offline businesses can also benefit from AI, through a systematic tracking of indicators such as location of individual mobile phones, correlations between weather data and sales, number of passers-by, and sales.”

S13: “In the coming years, we will face a change in the roles of the Marketing and Sales teams because most of the operations (especially the more routine ones – market analysis, trend identification, credit risk analysis...) will be executed by robots.”

S16: “Deep changes, mainly positive, are expected to happen in society, arising from technological advances and Artificial Intelligence, in the next 5 years. (Considering the various aspects of human life – health, education, comfort, security, economic well-being, etc.)”

S17: “There is an urgent need to clearly regulate the development of AI systems in areas like transparency, explanation of all functionalities, capabilities and purposes.”

Moreover, 5 statements had a positive evaluation, even though they were rated between 4.5 and 5.5. Thus, the **partially verified** issues relate to the impact of AI in areas such as price management, internet of things, NPL, chatbots' ethics and privacy and data policy:



S4: “In 5 years, the measurement of the target audience purchasing power (income brackets) to better adjust the price (and the features) of products or services will be dominant.”

S7: “Automatic purchasing systems (systems which, based on parameters defined by the customer, will buy autonomously) will become common, both for consumer goods (B2C) or to re-supply in the retail area (B2B).”

S8: “Within 2 years, companies will use Artificial Intelligence systems based on Natural Language Processing in their contact centers, allowing customers to choose how they want to contact the company and how they want to receive a reply – either by writing or by voice.”

S10: “When a particular site uses chatbots to mediate interactions with customers, these should be informed that their interlocutor is a robot.”

S15: “Privacy and data protection laws (General Data Protection Regulation) in the European Union and the USA will be an important limitation for the potential of AI for Marketing (for example, in market research and customer recognition).”

On the other hand, there were two ideas that scored less than 4.5, so we rated their expected validity as **inconclusive**. These statements would relate to AI's expected ability to operate websites autonomously, and to act as a decision-maker in planning and strategy-setting.

S6: “In 5 years, most company internet websites will be developed by deep learning systems, allowing for real-time adjustments in design and content to optimize for Search Engine Optimization.”

S14: “Within 5 years, robots will be used not only at the operational level, but also in the definition of strategies and even planning and goal setting.”

## **5.2. Theoretical Implications**

Although this is an exploratory study and it is not possible to draw closed and proven conclusions, some theoretical implications can be drawn. In fact, one of the aims of the present thesis was to narrow the gap between the theory on the impact of artificial intelligence on marketing and business management, and what is actually expected to be found in the near future.

The first is that there are increasingly more technological options that are successful in several companies, and experts confirm that they do add value in optimizing marketing work. However, it should be noted that some of the tools need to be much more optimized to be useful to marketing departments (for example, the automatic website creation by deep learning systems).

Data proliferation has often been cited as a key enabler of processes, and personalization will continue to be a trend with increasing growth potential over the next few years due to various advances in customer recognition and segmentation.

Another important insight is that there is some interdependence between the technological developments among the various areas. For example, advances in program advertising depend directly on segmentation, customer recognition, and strategic alignment of the communication plan.

It is undeniable that one of the major constraints to the exercise of machine learning systems is data protection regimes. Even so, most experts pointed out the importance of regulating the creation and activity of intelligent algorithms, and also recall the importance of ethics since it is often possible to get creative and circumvent the rules.

Although there are already systems that perform extremely complex operations with an efficiency far superior to human labor, and there is a growing tendency for technology to evolve and be increasingly adopted, one of the study's most fracturing topics was the usage of robots for decision making and strategy definition. With this it can be concluded that at least in the medium term we can expect that a human vision on business activities will always be necessary, so it is human workers with characteristics that (at least for now) the machines lack - creativity, common sense, critical spirit and risk consideration.

### **5.3. Managerial Implications**

This study attempted to unveil what the future holds regarding the development of artificial intelligence and how it can add value to the various fields of marketing. Due to the key insights that emerged, it could be a useful tool to guide organizations in defining marketing strategies and overall corporate management.

The first insight warns of the added value of defining medium- to long-term strategies, considering the expected technological advancement, considering the current activities and processes of the company in question and the available resources. Directors and managers should be alerted and encouraged to search for technological resources and solutions available on the market. In fact, there are efficient and sophisticated systems currently available at a fair cost, namely in the areas of market segmentation, sales forecast and programmatic advertising.

For larger companies, customer service is an area that could be highly optimized by using chatbots. These systems are already widely used and register good effectiveness and consumer acceptance. However, two points should be considered – first, the tool must be well designed and fully “taught” about the frequent asked questions, as it should sense when the conversation should be forwarded to a human; secondly, it would be important to clarify the customer that his interlocutor is a robot, for a matter of transparency and avoid the usage of abbreviations or typos.

Despite the plethora of possibilities of this “brave new world” of intelligent systems, we must also consider the limitations that arise and that limit invasive techniques proposed by these new tools. This is the case with data protection regimes and regulations that are emerging for consumer protection. This issue can be approached from two compatible points of view – it is true it has always been in the best interest of marketing to get to know the customers, to know who they are, what they are looking for and how much they are willing to pay -as we did in the past, in the future we will continue to be creative and find ways to get as much information as possible. On the other hand, the respect for privacy and, above all, common sense, should be hallmarks of organizational conduct, not only for reasons of reputation but essentially for ethical duty.

#### **5.4. Research Limitations**

A sample of 21 participants may be considered small, so similar studies may be conducted with a larger sample. In addition, E-Delphi was attended by 8 international and 13 Portuguese participants, which inevitably mirrors more accurately the reality of Portugal despite the valuable and considerable contributions of experts from other parts of the world.

Moreover, we looked for specialists who had accumulated marketing and artificial intelligence backgrounds, but we have to recognize that some had more expertise in one area than another, which may be a limitation to the holistic and impartial approach to the subject.

#### **5.5. Suggestions for Future Research**

The suggestions of future research that emerged from this study relate mainly to the need to analyze which processes inherent to corporate activity can be assisted or automated using artificial intelligence. Thus, similar studies could be applied to specific sectors, in order to understand which technologies would be useful to address particular needs. For example, the construction sector can benefit greatly from an intelligent retailer system but may not see much use in a customer service system such as chatbots.

Although there are distinguished specialists in Portugal regarding this subject, it would be interesting for this study to be replicated in countries with greater involvement of artificial intelligence, such as Japan, USA China or Germany. The objective would be to bring together experts with a deeper and more practical experience on the development and operation of these systems.

One of the issues that generated the most controversy among the invited experts was the intervention of intelligent systems in the planning and definition of strategies. Some of the comments denoted some perplexity with the idea of having machine deciding, being creative and assisting management planning. This is a question that can be studied individually since, in fact, several experiments have already been carried out which have shown that machines are capable of “storing” such an amount of information that they are

capable of being creative and possibly surpassing humans in problem solving and thinking out of the box.

In recent years, marketing has been increasingly concerned with customers and trying to understand them and access their wants. AI offers several tools and possibilities to scanner target desires, and this area has been recording incredible advances. However, the capabilities of these systems must be closely assessed and regulated so as not to trample common sense, and not to violate a universal human right which is the right to privacy. This fine line - between the amount of data that companies are reasonably able to collect, and what is condemnable and immoral - is a matter that deserves to be studied, as well as the willingness of organizations to be fair and cordial in collecting personal data from customers.

Another pertinent question is to what extent we can put artificial intelligence and automation at the service of the welfare of the individual human being, and at the same time of society and the world economy. Returning to the issue of labor substitution of humans for machines - a theme that has already been addressed several times throughout this thesis - efforts could be made to try to get machines to fill the positions that represent the heaviest work and that can bring harm to human health. In addition, automating part of vocational education and training to democratize it using intelligent systems that measure their own performance and effectiveness can be a way forward to give people jobs, and stimulate the skills of each individual. one.

Still within the ethical clues, we can reflect on the impact of artificial intelligence on the environment, which systems and practices should not be developed and implemented, and how we can use AI in favor of a more sustainable planet.

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## 7. Annex

### Annex 1: Questionnaire as seen in E-Delphi Platform

**QUERIES**

QUERIES YOU HAVE STARTED ANSWERING

[AI IMPACT ON COMPANIES' MARKETING](#)

Marketing FutureCast Lab, a branch of ISCTE - Lisbon University Institute, is conducting a study on how the Artificial Intelligence will impact the future of Marketing and what will its repercussions be for companies.

Each question should be replied using a traditional Likert scale, but please bear in mind that **below the scale to be used there is a box for the comments and/or replies** you wish to share with the panel. Thou anonymous, those comments and replies are crucial to better understand your opinion about each of the subjects.

After voting and commenting on each question, press **"NEXT"** at the bottom of the page. If you don't want to answer to any particular question, press **"SKIP"** instead.

**We thank you for your time answering the following query!**

Created: Apr 23, 2019 CONTINUE ANSWERING

#### 1. Customer recognition - don't forget that below the Likert scale there is a box for you to write your comments

Within 5 years it's expectable that most companies present in online environment will be using Artificial Intelligence systems capable of recognizing the customer in a more efficient way, in order to adapt the value proposition.

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

I fully disagree  
  I mostly disagree  
  I somehow disagree  
  I have a neutral position about this  
  I somehow agree  
  I mostly agree  
  I fully agree

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

#### 2. Segmentation - don't forget that below the Likert scale there is a box for you to write your comments

Market segmentation systems, according to the history-based accuracy degree (machine learning), will be dominant in medium and large enterprises in the next 5 years.

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

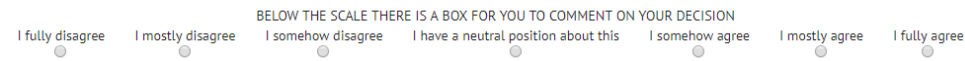
I fully disagree  
  I mostly disagree  
  I somehow disagree  
  I have a neutral position about this  
  I somehow agree  
  I mostly agree  
  I fully agree

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 3. Sales prediction - don't forget that below the Likert scale there is a box for you to write your comments

Within 5 years, AI systems are expected to be able to execute sales predictions with a considerably higher accuracy than current ones.

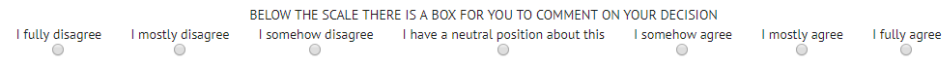


ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 4. Price - don't forget that below the Likert scale there is a box for you to write your comments

In 5 years, the measurement of the target audience purchasing power (income brackets) to better adjust the price (and the features) of products or services will be dominant.

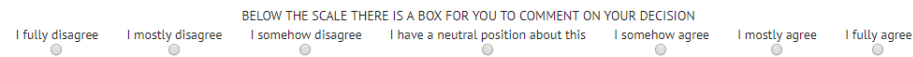


ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 5. Communication - don't forget that below the Likert scale there is a box for you to write your comments

Programmatic advertising (a system for optimizing the purchase of online advertising space between agencies and publishers without human intervention on a case-by-case basis) will become dominant in online advertising in the next 2 years.

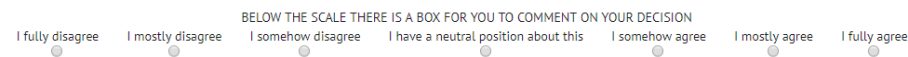


ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 6. Communication - don't forget that below the Likert scale there is a box for you to write your comments

In 5 years, most company internet websites will be developed by deep learning systems, allowing for real-time adjustments in design and content to optimize for Search Engine Optimization.

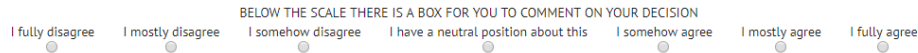


ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 7. Internet of Things - don't forget that below the Likert scale there is a box for you to write your comments

Automatic purchasing systems (systems which, based on parameters defined by the customer, will buy autonomously) will become common, both for consumer goods (B2C) or to re-supply in the retail area (B2B).

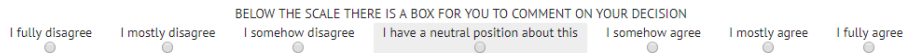


ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 8. Chatbots & Customer Service - don't forget that below the Likert scale there is a box for you to write your comments

Within 2 years, companies will use Artificial Intelligence systems based on Natural Language Processing in their contact centers, allowing customers to choose how they want to contact the company and how they want to receive a reply – either by writing or by voice.

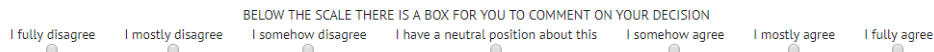


ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 9. Chatbots & Customer Service - don't forget that below the Likert scale there is a box for you to write your comments

AI can be used to improve customer service standards by adjusting channeling towards chatbots or human responses in a machine learning process.



ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 10. Chatbots & Customer Service - don't forget that below the Likert scale there is a box for you to write your comments

When a particular site uses chatbots to mediate interactions with customers, these should be informed that their interlocutor is a robot.

I fully disagree I mostly disagree I somehow disagree I have a neutral position about this I somehow agree I mostly agree I fully agree

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 11. Chatbots & Customer Service - don't forget that below the Likert scale there is a box for you to write your comments

Human Vs Bot: Using chatbots leads to a decrease in the credibility of a company's customer service.

I fully disagree I mostly disagree I somehow disagree I have a neutral position about this I somehow agree I mostly agree I fully agree

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 12. Brick and Mortar - don't forget that below the Likert scale there is a box for you to write your comments

Offline businesses can also benefit from AI, through a systematic tracking of indicators such as location of individual mobile phones, correlations between weather data and sales, number of passers-by, and sales.

I fully disagree I mostly disagree I somehow disagree I have a neutral position about this I somehow agree I mostly agree I fully agree

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 13. Labor impact - don't forget that below the Likert scale there is a box for you to write your comments

In the coming years, we will face a change in the roles of the Marketing and Sales teams because most of the operations (especially the more routine ones – market analysis, trend identification, credit risk analysis...) will be executed by robots.

I fully disagree I mostly disagree I somehow disagree I have a neutral position about this I somehow agree I mostly agree I fully agree

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION



ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

#### 14. Labor impact - don't forget that below the Likert scale there is a box for you to write your comments

Within 5 years, robots will be used not only at the operational level, but also in the definition of strategies and even planning and goal-setting.

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

I fully disagree   I mostly disagree   I somehow disagree   I have a neutral position about this   I somehow agree   I mostly agree   I fully agree

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

#### 15. Privacy and Data policy - don't forget that below the Likert scale there is a box for you to write your comments

Privacy and data protection laws (General Data Protection Regulation) in the European Union and the USA will be an important limitation for the potential of AI for Marketing (for example, in market research and customer recognition).

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

I fully disagree   I mostly disagree   I somehow disagree   I have a neutral position about this   I somehow agree   I mostly agree   I fully agree

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

#### 16. Ethics/Society - don't forget that below the Likert scale there is a box for you to write your comments

Deep changes, mainly positive, are expected to happen IN SOCIETY, arising from technological advances and Artificial Intelligence, in the next 5 years. (Considering the various aspects of human life – health, education, comfort, security, economic well-being, etc.)

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

I fully disagree   I mostly disagree   I somehow disagree   I have a neutral position about this   I somehow agree   I mostly agree   I fully agree

ELABORATE ON THIS TOPIC (ADD A COMMENT)

SAVE

### 17. Ethics/Society - don't forget that below the Likert scale there is a box for you to write your comments

There is an urgent need to clearly regulate the development of AI systems in areas like transparency, explanation of all functionalities, capabilities and purposes.

BELOW THE SCALE THERE IS A BOX FOR YOU TO COMMENT ON YOUR DECISION

I fully disagree   I mostly disagree   I somehow disagree   I have a neutral position about this   I somehow agree   I mostly agree   I fully agree

ELABORATE ON THIS TOPIC (ADD A COMMENT)

[SAVE](#)

### 18. And finally...

Considering all the subjects mentioned throughout this query – and perhaps others you're aware of – can you please make a short statement on what you think Artificial Intelligence systems will bring to companies' management and marketing in the near future?  
In the end please state your name, so we can quote you in the final report of this study.

ELABORATE ON THIS TOPIC (ADD A COMMENT)

[SAVE](#)

Marketing FutureCast Lab thanks you for your time and participation. Don't forget to return for the second round, from May 13th to 29th.

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