

“The impact of artificial intelligence on commercial management”

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ARTICLE INFO

Renato Costa, Álvaro Dias, Leandro Pereira, José Santos and André Capelo (2019). The impact of artificial intelligence on commercial management. *Problems and Perspectives in Management*, 17(4), 441-452. doi:[10.21511/ppm.17\(4\).2019.36](https://doi.org/10.21511/ppm.17(4).2019.36)

DOI

[http://dx.doi.org/10.21511/ppm.17\(4\).2019.36](http://dx.doi.org/10.21511/ppm.17(4).2019.36)

RELEASED ON

Wednesday, 08 January 2020

RECEIVED ON

Monday, 09 September 2019

ACCEPTED ON

Tuesday, 03 December 2019

LICENSE



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JOURNAL

"Problems and Perspectives in Management"

ISSN PRINT

1727-7051

ISSN ONLINE

1810-5467

PUBLISHER

LLC “Consulting Publishing Company “Business Perspectives”

FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

23



NUMBER OF FIGURES

1



NUMBER OF TABLES

6

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

Received on: 9th of September, 2019

Accepted on: 3rd of December, 2019

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Capelo, 2019

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON COMMERCIAL MANAGEMENT

Abstract

The essence of this research is to shed light on use and importance of artificial intelligence (AI) in commercial activity. As such, the objective of the present study is to understand the impact of AI tools on the development of business functions and if they can be affirmed as a means of help or as a substitute for these functions. In-depth interviews were conducted with 15 commercial managers from technological SMEs. The results indicate that all the participants use AI systems frequently, that these tools assist in developing of their functions, allowing having more time and better preparing to solve the commercial problems. The findings also indicate that the tools used by commercials are still somewhat limited, and companies should focus on their training and development in AI, as well as the training of their commercials. Furthermore, the results show that firms intend to use the data collection and the analytical tool that enable real-time response and customization according to customer needs.

Keywords

artificial intelligence, decision-making, analytical tools,
consultancy, SMEs, CRM

JEL Classification

M15, M19, M30

INTRODUCTION

In the current context, there is clear importance that AI has assumed in several areas, such as radiology (Paiva & Prevedello, 2017), cardiology (Mesquita, 2017), data analysis (Sharma, Mithas, & Kankanhalli, 2014), marketing and sales (Martínez-Lopez & Casillas, 2013). AI is seen as a powerful tool in the development of daily tasks in each of these areas, helping stakeholders make better decisions and optimizing the response time of professionals. However, some questions arise: what kind of intelligent machines and what functions will they be able to perform, and above all, what place will the human being occupy when this happens? Is it just a means of help, or can AI become a substitute for some functions in the future? As such, the main motivation for this article is to try to find some answers to the questions posed, as well as to understand this theme so in, and that is present through the most varied forms in our daily lives. Furthermore, this article aims to understand what type of AI systems' are used in commercial area, and how these tools can be used for development of daily tasks.

It will also be one of the objectives of this research to understand how business professionals look at this type of AI system in the future. In other words, the intention is to understand if they value these systems, how they view them for the future of their function and the organization itself, and what perception they have about the way companies look at these AI tools.

Considering the literature, more and more authors, such as Ahearne (2017), Nartissa (2012), Steenburgh and Ahearne (2012), and Palmatier

(2017), argue that there must be a partnership between universities and firms, to solve everyday-life problems. And this is only likely to happen if companies provide real data that impact the studies performed. Another objective of this research will be to understand how professionals in the commercial area look at this type of partnership, value training and how, if exists, they seek knowledge to find the solutions in their daily lives.

This paper is divided into two parts: theoretical and an empirical part. The first part is divided into concept and framework, studies conducted in the commercial area, and studies linking AI and the commercial area. The second part concerns the research methodology, the results, and the discussion. In the end, the conclusions are presented.

1. LITERATURE REVIEW

1.1. AI concept and evolution

According to Lustosa (2004), the term AI first appeared in 1956. The idea was that machines have the same human intelligence capabilities and could reproduce intelligent behavior. Gunkel (2012) stated that the concept of AI was first defined and characterized by Alan Turing in 1950. The term AI is related to the development of expert systems to solve the problems in specific areas, such as medicine, which has benefited greatly from AI developments (Mendes, 1997). The incorporation of a natural language into the expert system is simple, and that obeys the semantic rules (Mendes, 1997).

Costa (2009) stated that AI includes the methods, tools, and systems for solving the problems that typically require the use of human intelligence. Other living systems also have intelligence and complex problem-solving capabilities, adapting to new realities. Thus, AI can also be considered as the ability to systematize the problem-solving by observing the complex systems existing in living nature.

According to Costa (2009), when living systems identify a problem, they react adaptively way by performing three complex tasks: pattern recognition in images and sounds, language processing, and action planning and prediction. Costa (2009) also argues that heuristics is closely related to problem-solving. This is because heuristics, which means discovery, is based on experience, rational ideas and rules, despite the common sense associated with the concept. Thus, the author considers that one of the major challenges of AI will

be to integrate the heuristics by establishing the mathematical and algorithmic methods, enabling its use in a computer system. Still, according to Costa (2009), an artificial neural network (ANN) is a machine designed to model the way the brain performs its tasks. These resemble the brain because knowledge comes from experience through a learning process, and the connecting forces between neurons allow accumulating the acquired knowledge.

The author argues that AI and ANN are very useful techniques for the study of zootechnics, as they allow more effective by processing real the information through simulations. However, Costa (2009) argues that the zootechnician cannot be abolished from the equation, as it is this subject who inserts the data into the machine and who oversees the entire process.

Sarfati (2016) states that AI is machine learning and believes that both AI and the collaborative economy will have a major impact on social relationships. Without broadening the concept of collaborative economics, as this is not the objective of this paper, it refers to a type of business that involves peer to peer or P2P exchanges, such as the platform. Sarfati (2016) refers to Tesla S model that, in addition to the constant innovations that are made in the automotive industry year after year, has incorporated an autopilot system fueled by AI algorithms. He also states that the system can learn and improve its performance after each trip and make safer decisions than a human being.

Sarfati (2016) also warns that AI is moving towards a future replacement of human beings in routine and repetitive tasks. According to Sarfati (2016), AI can assert itself as a substitute for less-

skilled jobs by creating cheaper and more efficient automated solutions, confirming the above with the following example: "In the last 15 years, the US economy has grown 15% and the employment level fell 1%." Given a more recent perspective, Mesquita (2017) says that AI is defined as a set of items (e.g., algorithms, robotics, and neural networks), which allows the software to have intelligence capabilities compared to that of a human being, including the ability to learn with minimal human interference.

The subject that has been approached so far can be found in many different forms and sciences. It can be evidenced that it is approached in various contexts and occasions. Recent studies that have most motivated the enthusiasm of the scientific community and medicine concern AI and the concept of machine learning, which means the ability of a system or computer to learn over time (Mesquita, 2017).

Obermayer and Emanuel (2016) suggest that in a digital age, where information is directly collected from patients through examinations (e.g. radiology), the need for medics increases. Machine learning contributes once again to automated decision-making, thus adding the ability to collect the data without human intervention automatically. The bottom line is autonomous and more effective machine to make decisions better than humans.

Unlike Obermayer and Emanuel (2016), medicine is considered an area where specialists are extremely difficult to replace (Mesquita, 2017). However, the use of these machines makes perfect sense and that it improves the doctor's ability to make a better decision and with a significant reduction in the analysis process (Mesquita, 2017).

From a corporate perspective, Lustosa (2004) states that AI is already present in many companies through data mining and is a fundamental part of the decision-making process because it generates strategic information not always recognized by human analysts.

According to Lustosa (2004), AI is also present in network management systems, e-commerce, and distance education. Intelligent agent technology allows negotiating between the system and the hu-

man user, while always monitoring the surrounding environment, generating the information that can be further analyzed by other intelligent systems or even humans.

Lustosa (2004) states that the evolution that computers have been undergoing since they appeared was astounding, and questions what might happen or become possible if AI progresses to the same extent and at the same pace. What kind of intelligent machines and what functions will they be able to perform, and most of all, what place will a human being occupy when this happens?

Dornelles (2018) carried out a study that aimed to use ANN-based AI and genetic algorithms, to predict oat grain yield (oat sativa) and to optimize seeding density in the main succession systems of Southern Brazil. Dornelles (2018) concludes that the use of AI, through ANN techniques and genetic algorithms, allows efficiently simulating oat grain yield with better optimization of sowing density when compared to traditional polynomial regression models.

Within the study by the above author, other studies with a similar basis have been developed. It can be said in a study conducted 14 years earlier, where it can be understood that the basis is similar, since it addresses the theme of ANN (Poersch, 2004). Connectionism, which is based on a parallel distribution processor, seeks to design computers inspired by the human brain. The number of neurons that make up the neural network is closely related to the learning algorithm designed to train the network. This neural network consists of three layers: an input neuron layer, an intermediate neuron layer, and an output layer. The middle layer is responsible for the network learning process (Poersch, 2004).

Poersch (2004) also states that cognition science is the study of intelligence and computational processes. According to neuroscience, it is the area of knowledge that studies the input, storage, processing, and retrieval of knowledge, both declarative and procedural, whether natural or computer simulated. Poersch (2004) argues that a neural network is constituted as a machine designed to simulate the way the brain performs a certain task or function.

Thus, for Paiva and Prevedello (2017), AI will bring professional changes for radiologists, just as it has changed some aspects of people's lives, such as electricity, internet, thus improving people's quality of life. But it is not only in radiology that AI has had an impact, in medicine, this has also happened, as has been the development of software to identify the malignant dermatological lesions. Lab exams are also analyzed almost automatically. Paiva and Prevedello (2017) consider that these technological advances are mainly due to three factors: the abundance of existing data, the development of ANN, and reduced hardware cost.

Regarding the development of neural networks, they permit an increase in efficiency, recognizing, in some studies, that the effectiveness of the machine surpassed the effectiveness of humans (Paiva & Prevedello, 2017).

According to Paiva and Prevedello (2017), the impact of AI on the routine of radiologists must be progressive because there is the software that provides the data that cannot be extracted from the images, but the importance of radiologists in integrating the information obtained through the data from AI.

Paiva and Prevedello (2017) also think that radiologists should integrate these techniques into their daily lives in order to provide better service to patients.

1.2. Studies carried out in the commercial area

Increasingly, companies are seeking to build close relationships with research centers and business schools. This trend is the result of research that has been done that has helped companies evolve the way business is done today, and it also leads to a natural evolution of theoretical knowledge (Ahearne, 2017; Nartissa, 2012; Steenburgh & Ahearne, 2012).

Despite the advances made in the research conducted in the area of marketing, in the sales area, advances are scarcer (Ahearne, 2017). Most likely because sales executives wonder what the real impact sales studies can have. One of the barriers that most sales researchers have encountered

is access to quality business data, and the need to identify the issues that are truly impacting for the academic community and sales directors at the same time.

According to Ahearne (2017) for decades, business schools have been conducting the investigations, mainly in the areas of finance and marketing, in order to improve the student education. However, Kumar (2017) says that research that is not based on evidence makes it difficult for students to apply what is learned in the real world, due to its extremely theoretical nature. As suggested by Wetherbe and Eckhardt (2014), many business schools conduct a great deal of research, which generates a great deal of interest from the academic community, but of little interest in the business world. Taking the example of medicine, which conducts research that can be applied in practice by health care professionals, much of the research carried out at management level lacks applicability in practice. If this happens, Ahearne (2017) considers that companies may become more interested.

Lilien (2017) also states that to teach effectively, it is necessary to "tackle" real problems, have a high degree of expertise, access the data, and have resources to get started.

Palmatier (2017) states that the most successful research centers have five key factors: strong leadership, production of relevant research, strong relationships with firm directors, a diverse and well-coordinated team of students, researchers, theorists, and teachers, and a related academic community. For Nartissa (2012), most microenterprises are concentrated on direct management and production, not on research. They do not reach their full potential due to lack of knowledge about method, skills, and new trends in science and research.

Steenburgh and Ahearne (2018) presuppose understanding how to sell new products by the proper training of salespeople, or massively betting on product demos. Steenburgh and Ahearne (2018) suggest that the most successful sellers are those who constantly want to learn because customers want to know exactly the history of the products they buy. Therefore, it is necessary to create a mindset of demand, research and development in corporate salespeople.

Steenburgh and Ahearne (2018) state that the time spent in each customer is longer for a seller selling a new product than a seller who sells regular goods. The authors also suggest that companies should have a candidate selection system that includes an analysis of their skills and market knowledge. Another point is the training program that the company must provide to the seller of a new product, which should be based on the acquisition of new skills, as well as personal growth, as selling new products puts the sellers' confidence to the test.

Steenburgh and Ahearne (2018) say that the managers' thinking must also change in order to have the same attitude of seeking knowledge, as well as applying and trying new strategies and approaches to the market. In other words, basically putting themselves on the line and putting the seller on the line, not just blaming the product when it does not fit the market at some point.

Finally, Steenburgh and Ahearne (2018) conclude that the companies questioned admit that investing in research and development is not sufficient, there must be a commitment to commercialization (e.g., effective seller selection, training and coaching processes), and not only in launching the innovative ideas and products.

1.3. AI trends in the commercial area

Zoltners, Sinha, and Lorimer (2018) addressing the issue of decreasing sales forces, state that many industries have had to decrease their sales force. They indicate several reasons for these cuts, such as changes in a dynamic market, as well as consumer needs, new sales channels, and market growth slowdown; changing company strategy, including new priority and more specialized products/markets; the desire to increase productivity by eliminating unproductive and inefficient sales times, reducing the cost of sales. A sales force decrease is always a stressful and cumbersome event (Zoltners et al., 2018). These cuts do not always happen for the right reasons and in the best way, leading to the loss of key customers and a decrease in sales team performance.

Furthermore, the internet has transformed the traditional marketing model and its system (Khatibi,

Thyagarajan, & Seetharaman, 2003). Khatibi et al. (2003) also conclude that most of the companies interviewed consider that e-commerce is a real competitive advantage and that competing companies that ignore this technological advance will eventually close down. The companies interviewed consider e-commerce to be the future, and it is a benefit to providing the information, spreading the company's image, improving the business processes, and customer service.

On the other hand, Sharma et al. (2014), state that in recent years, interest in the subject of big data and analytics has increased, by companies and researchers in the areas of AI and management, due to its potential to increase the organizational performance. According to Sharma et al. (2014), at the same time that automated AI systems process the data, they also generate a significant amount of information. This information can and should be used to make better decisions.

Managers and analysts nowadays have at their disposal a huge amount of analytical tools such as data analysis, data mining, and data visualization. However, in order to be able to process the data and gather the information from these systems, analysts and managers are critical because they must constantly enter the data into the system so that it can evolve at the informational level (Sharma et al., 2014).

Only in this way, as mentioned above, is information about the business processed, which allows increasing the organizational performance, as well as operational level, in the employees' daily tasks (Sharma et al., 2014). Its main objective is to optimize the work of each one, either in a management function (e.g., costs and income), which is more of analysis and planning, or in a more operational function, such as the salesperson.

Sharma et al. (2014) affirm that the fact that these systems produce the information alone is not enough to improve the performance. Dealing with this type of systems needs proper training and know-how to interpret and value the information obtained to make good decisions. Therefore, the authors state that the use of these analysis systems depends largely on each person. Sharma et al. (2014) state that the use of business intelli-

gence enables the companies to better understand their business problems, as well as the market in which they operate, identifying the opportunities through analysis of current operations, and which may lead to new forms of financial return or savings costs.

Sharma et al. (2014) conclude that analysts and managers should pay particular attention to information that creates value while ignoring less relevant ones. By value creation, the authors mean information that is important to make strategic and operational, day-to-day decisions.

2. METHODOLOGY

This research was based on a pragmatic or inductive character, and a non-probabilistic conveni-

ence sample, constituted according to the availability and accessibility of the elements addressed (Carmo & Ferreira, 1998). Fifteen interviews were conducted with commercials from various companies. However, it is important to note that these were intentional to constitute the sample since the participants who best represented the investigated the phenomenon in terms of knowledge were selected. Although the response rate is considered satisfactory, the findings of this investigation should be carefully taken from a small sample. Thus, given the impossibility of making generalizations, this factor presents itself as the main limitation of this investigation, with the due exception that generalization was not a primary objective either.

Regarding the methodology applied, this research was based on a set of primary sources, from the

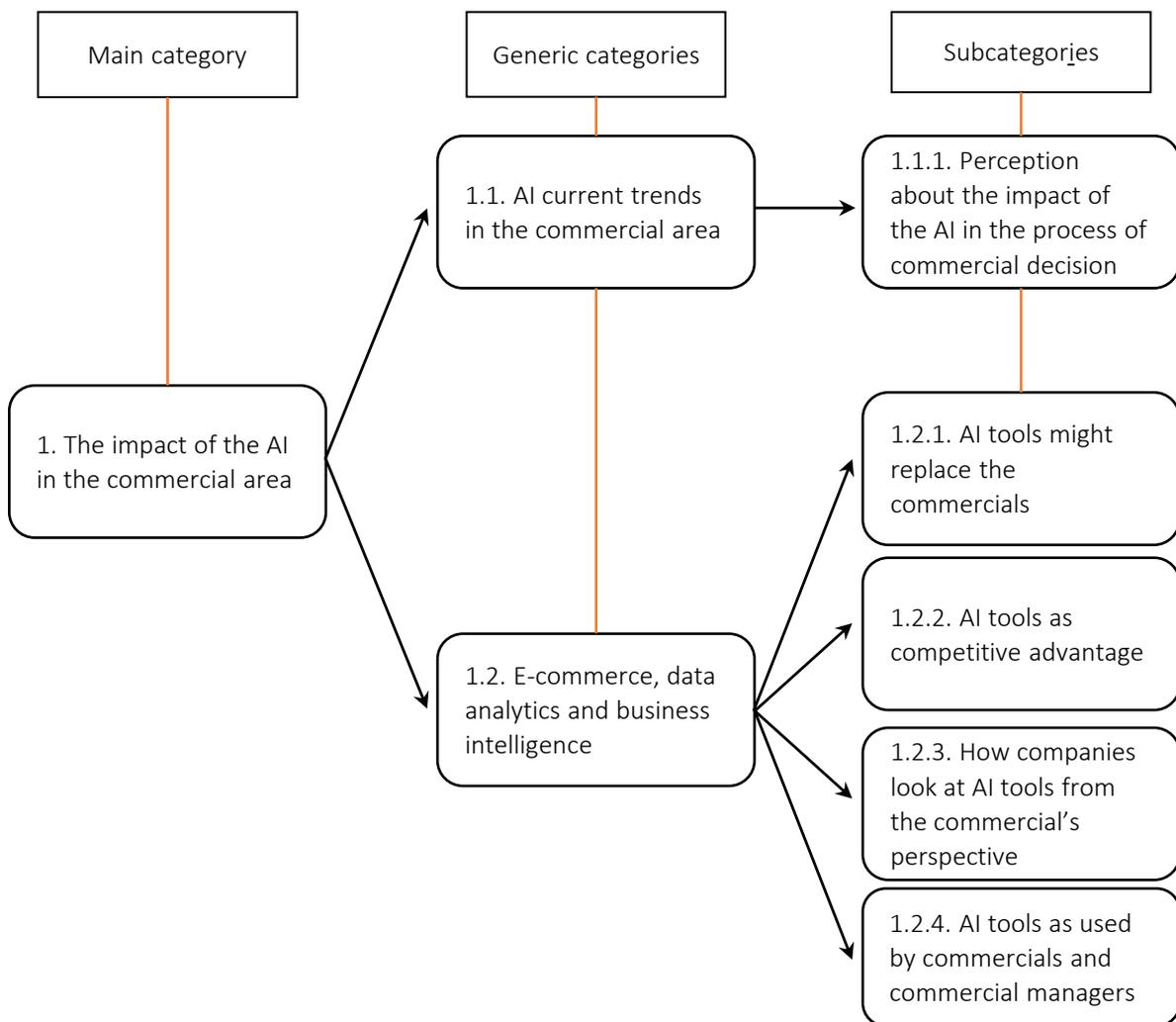


Figure 1. Categorization and coding of the interview corpus for qualitative analysis

Table 1. Framework of the research objectives and research questions

Objective	Research questions	Framework
Analyze the role of AI in the commercial area, its impact on the performance of commercial employees, and in the decision-making process	Q1 – What is the impact of AI tools (e.g., data analysis and processing systems) on the daily commercial decision-making process?	Martinez and Casillas (2013), Sharma et al. (2014), Lustosa (2004), Mesquita (2017), Dornelles (2018)
Verify which AI tools are used by commercials, and to understand the perception about the use of these tools	Q2 – Are AI tools a substitute for business professionals, or will they help in the development of their functions?	Martinez and Casillas (2013), Sharma et al. (2014), Zoltners et al. (2018), Khatibi et al. (2003), Costa (2009), Sarfati (2016), Lustosa (2004)
	Q3 – How do companies view these types of AI tools?	Sharma et al. (2014), Costa (2009), Sarfati (2016), Obermayer and Emanuel (2016), Mesquita (2017), Paiva and Prevedello (2017)
	Q4 – Are AI tools seen as a competitive advantage?	Martinez and Casillas (2013), Sharma et al. (2014), Zoltners et al. (2018), Khatibi et al. (2003)
	Q5 – What type of AI tools might be useful for commercials and business managers to use?	Nartissa (2012), Steenburgh and Ahearne (2018), Zoltners et al. (2018)

application of surveys on semi-structured interviews to commercials from various companies, and from secondary sources, through bibliographic research and information processing, comprised in the systematized study developed in books, magazines, scientific articles, and electronic networks.

Regarding the qualitative analysis technique used to interpret the data reproduced in the interviews, it was translated into a content analysis, trying to relate the semantic (significant) structures with the sociological (meaning) structures, in order to articulate the surface of the texts with the factors that determine their characteristics (psychosocial variables, cultural context and context, processes, and message reproduction) (Duriau, Reger, & Pfarrer, 2007). Figure 1 details the categorization and codification of the in-depth interview that gave rise to the qualitative analysis.

From the voice reproductions, the process, systematization and expression of message content, promoted by content analysis, was organized in accordance with the three chronological poles of Bardin (1977), in other words, a first phase, where ideas were organized and systematized, and a second phase, in which all the material was explored, and the treatment and its interpretations of the results obtained were performed at the end.

In Table 1, on the other hand, it is possible to analyze the relationship between the study objectives, the research questions elaborated, and their connection with the literature review previously made.

At the beginning of the interviews, all the variables were collected that could statistically characterize the sample, especially regarding its demography, age group, gender, qualifications, and academic background, in order to understand the existing sample regarding its nature and dimension of experience and professional knowledge (Freitas, 2013). Finally, we proceeded to the content analysis of the answers in order to obtain the data that later allowed to draw theoretical and empirical conclusions.

From the total number of interviewees, 20% were men and 80% women. Regarding the academic qualifications, five respondents (33%) have no higher education, 6 (40%) has a BA degree, 5 (33%) have a MsC degree. Regarding the period in their company, the average years is 3.8 years, and the average time of the interviewees in the commercial area is 6.5 years. This distribution is representative of the Portuguese labor market on the commercial area. According to the ESC (2014) report, the proportions in gender and education are very close to the sample.

3. RESULTS

3.1. Perception of the impact of AI on commercial decision-making

By analyzing Table 2, two types of impacts are considered by respondents relating to the role that AI tools have in the decision-making of commercials. These findings are aligned with Lustosa (2004), Mosque (2017), and Dornelles (2018) regarding

the facilitation of AI systems in decision-making.

Most respondents find that the AI tools they use in their daily lives help them negotiate better with their customers and, therefore, make better decisions in line with the argument of Martinez and Casillas (2013) considering AI tools to produce the automated decisions.

During the interviews, respondents mentioned the quality and quantity of information coming from the tools they use, as we can see in Table 2. However, giving more value to the quality of information, rather than quantity. One can also observe that four of the respondents affirm that AI tools allow them to have access to comparative market data and define the action plans, thus giving them a greater ability to argue with the client. These data allow partially confirming Sharma et al.'s (2014) argument, where AI tools generate a quantity and quality of information that has a great impact on the performance of companies and their employees.

Table 2. Impact AI tools have on commercial work

Key ideas	Frequency	Respondents
AI can help on routine tasks	1	1
Help in commercial decision-making	11	2, 3, 6 to 15
The amount of information coming from AI tools facilitates client negotiation	8	2, 4, 5, 6, 7, 8, 9, 11
AI tools allows comparing market data, with greater argumentative capacity	4	4, 8, 9, 10
AI tools have been changing the functions of commercials	4	5, 9, 12, 14

3.2. AI tools may replace commercials

Looking at Table 3, it can be seen that 13 respondents consider that AI tools will continue to be a means of assisting in the development of daily commercial tasks. To justify this point of view, 8 respondents also state that the commercial function still has a large weight, regarding the human relationship that is created with the customer.

This perspective reinforces what we are told in the literature by Costa (2009) and Paiva and Prevedello (2017), regarding the difficulty of re-

placement by AI tools in certain functions. In this particular case, the respondents consider that there are social skills in the commercial function and techniques (e.g., negotiation) that are difficult to reproduce by an AI system. Hence the vast majority of respondents consider that hardly an AI system can replace a commercial.

On the other hand, we can see that 2 respondents state that, in some areas and industries where work is more routine, substitution may occur, while in others, it will remain as a means of help. This perspective partially supports the view of Obermayer and Emanuel (2016) concerning the replacement of more automated functions. Although they do not mention it directly, when respondents talk about a possible replacement in some industries, this will eventually lead to a decrease in the sales force. In this case, the theory of Zoltners et al. (2018), when it states that the emergence of AI systems is generating the increasing interest and that this has led to the decrease of some sales forces.

Table 3. Commercial perspective about the future impact of IA tools in the commercial area

Key ideas	Frequency	Respondents
AI tools are and will continue to be a help in developing business functions	13	1, 2, 3, 5 to 15
It is difficult for an AI tool to perform trading functions	3	1, 7, 8
The commercial function still has a large weight in the human relationship with the customer	8	2, 5, 6, 8, 10, 11, 13, 14
In some industries where work is more routine, AI tools may become a substitute, in others where it is not, AI tools will be an aid	2	4, 12

3.3. AI tools as competitive advantage

About 53% of respondents (Table 4) consider that AI tools may replace commercial functions that will depend on business-to-business strategy, vision, and profitability. On the other hand, 53% of respondents also mention that companies view AI tools as a means of assisting in the development of daily tasks, as advocated by Lustosa (2004), Mosque (2017), Dornelles (2018). On this vein, respondents show some reticence regarding this theme, when asked about the possible view

Table 4. Companies perspective, according to commercials, about the future impact of AI tools on business

Key ideas	Frequency	Respondents
Very helpful, due to the difficulty of AI in negotiation	4	1, 7, 8, 14
There may be more automated AI tools (under the supervision of a human-being)	5	1, 6, 7, 11, 14
It may depend on B2B strategy, vision, and profitability	8	2, 4, 8, 9, 10, 11, 12, 15
AI as a mean for the development of business tasks	8	2, 4, 5, 6, 8, 9, 13, 14
Companies that want to evolve will have to follow the trend as traditional methods are falling further behind	5	3, 5, 8, 9, 15
Some companies pay little attention to AI	2	6, 12

that the company has about its functions. On the one hand, they consider that their function is irreplaceable; however, they admit that the permanence or not of their function in the future may have to do with the company's view of its business and profitability.

Reinforcing the point above, a third of respondents say that AI tools are the future and that if companies that want to evolve and stay on trend, have to keep up with those same trends, and increasingly use these tools. A third of respondents also say that in more routine roles, the company may consider replacing, but even with a more autonomous tool, human supervision will be needed.

In this case, the respondents believe that a partial substitution may happen, meeting what was verified in the literature review in the articles by Costa (2009), Sarfati (2016), Mosque (2017), Lustosa (2004), Paiva and Prevedello (2017) who consider that they concluded that professionals in other areas could not be replaced by an AI system, as they still need human supervision.

As for the e-commerce issue, it was never mentioned in this part of the interview by the respondents. Regarding the point defended by Martinez and Casillas (2013), Sharma et al. (2014), Zoltners et al. (2018), Khatibi et al. (2003), Costa (2009), and Sarfati (2016), it is found that respondents consider their function difficult to replace by AI systems because they consider the commercial function still highly dependent on customer relationship. However, respondents feel that companies, depending on the industry in which they operate, may think of a partial or even total replacement,

depending on their business vision and company profitability.

3.4. How companies look at AI tools from a commercial perspective

Looking at Table 5, all respondents consider that there is a clear advantage in the use of AI tools by commercials and companies. These data support the theory of Martinez and Casillas (2013), Sharma et al. (2014), Zoltners et al. (2018), Khatibi et al. (2003), when they state that the use of these tools was a great advance for companies.

Respondents consider that the use of these tools today should be a priority in any company, as it assists the commercial in the development of their daily tasks, either in the information collection and decision-making, as Martinez and Casillas (2013) argue. Respondents also value information allowing them to access more and better information. Sharma et al.'s (2014) perspective about AI tools and their technological advances, transforming employee's roles in companies is supported.

Hierarchically, in the table we can also see that the most cited justification by respondents to support their response, is that AI tools allow more real-time access to customer information. The second most mentioned justification has to do with the possibility that AI tools make it possible to make a more conscious decision, given the data presented. And lastly, three of the respondents justify that AI tools are a competitive advantage over other companies that do not use them, stating that there is a clear advantage for companies that follow technology development.

Table 5. Commercial perspective on competitive advantage in using AI tools

Key ideas	Frequency	Respondents
AI tools develop the competitive advantage	15	All respondents
More real-time access to customer information.	7	1, 5, 7, 8, 10, 13, 14
It allows a more conscious decision-making, given the data presented.	4	3, 4, 7, 10
Advantage of keeping up with technological development	3	8, 12, 15

3.5. AI tools used by commercials and commercial managers

Looking at Table 6, it can be seen that most of the respondents, about one-third, do not know or are unaware of what type of AI tools could be useful for their daily tasks. These results suggest that firms' should invest in AI training. Nartissa (2012) talks about research and training partnerships to improve the employees' performance. According to Steenburgh and Ahearne (2018), the best sellers are the ones who research the most and invest the most in training.

On the other hand, another group of 5 respondents indicated that it would be interesting for their daily life to have a tool that would allow data collection and analysis, while, in real time, generate a solution that best suits their customer. In other words, part of the respondents considers that the tools they use can still be improved and evolve to another level. In this case, the companies where these employees work should invest a little more in the area of AI and try to provide other solutions to their commercials.

The table also shows that at least three respondents do not use any type of Customer Relationship Management (CRM) tool or use a poorly developed tool. Being CRM, as stated by Zoltners et al. (2018), an essential tool for companies and employees to have access to all customer information.

4. DISCUSSION

Considering the results, it was possible to verify through the literature review the importance that AI has assumed in several areas. However, the studies that have been developed in the commercial area, including the AI theme, are very incipient.

The objective of this work was, therefore, to make a contribution, both professional and academic, where commercial area and AI could be integrated. And so, try to understand how AI influences the commercial area. Thus, AI is present and influences the daily life of the commercials that were interviewed, either in their decision-making or in the data collection, which eventually are relevant to their decision-making.

Based on the question of Lustosa's (2004) article which is, what kind of intelligent machines and what functions will they be able to perform, and above all what place will the human being occupy when this happens? Is it just a means of help, or can AI become a substitute for some functions in the future?

These turned out to be the basic questions of this research. The interviewees, in general, consider that AI enhances the competitive advantage, however, they consider that the relationship with the customer is still very important in

Table 6. Commercial perspective on the most beneficial tools in the future

Key ideas	Frequency	Respondents
Use of a collection and analysis tool integrated with other areas	2	1, 7
Using a data collection and analysis tool that enables real-time solution to be tailored to customer needs	5	2, 7, 9, 12, 15
Increasingly gradual use of e-commerce	2	2, 12
Use of a tool that allows to automating processes	1	3
CRM tool used for real customer management	3	4, 5, 10
Does not know or does not have the knowledge	5	6, 8, 11, 13, 14

the negotiation process and difficult to replace by AI.

Considering Ahearne (2017), Nartissa (2012), Steenburgh and Ahearne (2012), Kumar (2017),

and Palmatier (2017), they argue that there must be a partnership between universities and firms, promoting the knowledge transfer, as well as a search for knowledge is important for the evolution of the professionals.

CONCLUSION

Based on the results, some conclusions can be considered. First, commercials use AI tools, but their knowledge on this subject is still scarce, which can give us two indicators, or lack of training by companies in the area of AI, or lack of investment and training in the commercial area. In either case, the solution that seems most valid will be a strong investment from the companies or even from the professionals if their companies do not have this opportunity, both in the commercial area and in the AI area.

Second, in the commercial area, the use of tools such as e-commerce or data analytics systems has increased in recent years (Sharma et al., 2014). However, results also showed that firms are investing on data analytics systems, and reducing e-commerce efforts, which can generate an important return for companies, for non-key customers.

Third, it was interesting to realize that very few commercials mentioned the fact that e-commerce could be a substitute for commercial functions and could lead to the extinction of some jobs. Most of the respondents' discourse was directed at the importance that data analysis tools have in their daily lives.

Fourth, the participants do not believe that a machine can produce the same work they do, with the same effectiveness and efficiency, especially with regard to negotiation techniques or customer relationship. However, there is a small group of respondents who believe that the AI tools could lead to a total or partial replacement of professionals in this area. This, according to the respondents, in less qualified and more automated functions, and depending on the company and the business area in which they are, as also defended by Sarfati (2016) who argues that AI can assert itself as a substitute in less skilled jobs by creating cheaper and more efficient automated solutions.

Finally, it was also found out that AI systems have a great impact on the professional of the commercial area, because, as it was mentioned, it allows access to a quantity and quality of information in real time, which ultimately better prepares the professionals working in this area regarding negotiation processes with their clients, as defended by Paiva and Prevedello (2017) in their article on the impact that AI has on the daily work of radiologists.

REFERENCES

- Ahearne, M. (2017). Research centers, business schools, and the world of sales. *Journal of the Academy of Marketing Science*, 45(4), 461-464. Retrieved from <https://link.springer.com/article/10.1007/s11747-017-0536-7>
- Costa, E. (2009). Inteligência artificial aplicada à Zootecnia. *Revista Brasileira de Zootecnia*, 28, 390-396. Retrieved from http://www.scielo.br/scielo.php?script=sci_abstract&pid=S1516-35982009001300038&lng=en&nrn=iso&tlang=pt
- Dornelles, E. F., Kraisig, A. R., Silva, J. A. G., Sawicki, S., Roos-Frantz, E., & Carbonera, R. (2018). Artificial intelligence in seeding density optimization and yield simulation for oat. *Revista Brasileira de Engenharia Agrícola e Ambiental*, 22(3), 183-188. <http://dx.doi.org/10.1590/1807-1929/agriambi.v22n3p183-188>
- Duriau, V. J., Reger, R. K., & Pfarrer, M. D. (2007). A content analysis of the content analysis literature in organization studies. *Research themes, data sources, and methodological refinements. Organizational research methods*, 10(1), 5-34. <https://doi.org/10.1177%2F1094428106289252>

5. ESC (2014). *European Sector Skills Council Commerce Report 2014*. European Skills Council. Retrieved from <https://www.eurocommerce.eu/media/113775/European%20Commerce%20Skills%20Council%20Report%202014.pdf>
6. Gunkel, D. (2017). Comunicação e inteligência artificial: novos desafios e oportunidades para a pesquisa em comunicação. *Galaxia*, 34, 5-19. <http://dx.doi.org/10.1590/1982-2554201730816>
7. Khatibi, A., Thyagarajan, V., & Seetharaman, A. (2003). E-commerce in Malaysia: perceived benefits and barriers. *Interfaces*, 28(3), 77-82. <https://doi.org/10.1177%2F0256090920030307>
8. Kumar, V. (2017). The role of university research centers in promoting research. *Journal of the Academy of Marketing Science*, 45(4). <https://doi.org/10.1007/s11747-016-0496-3>
9. Lilien, G. (2017). Perspectives on university research centers: Lessons from the ISBM. *Journal of the Academy of Marketing Science*, 45(4). <https://doi.org/10.1007/s11747-017-0537-6>
10. Lustosa, V. (2004). O Estado da Arte em Inteligência Artificial. *Revista Digital da CVA – Ricesu*, 2(8).
11. Martínez-López, F., & Casillas, J. (2013). Artificial intelligence-based systems applied in industrial marketing: an historical overview, current and future insights. *Industrial Marketing Management*, 42, 489-495. <https://doi.org/10.1016/j.indmarman.2013.03.001>
12. Mendes, R. (1997). Inteligência artificial: sistemas especialistas no gerenciamento da informação. *Brasília*, 26(1). <http://dx.doi.org/10.1590/S0100-19651997000100006>
13. Mesquita, C. (2017). Inteligência Artificial e Machine Learning em Cardiologia – Uma Mudança de Paradigma. *International Journal of Cardiovascular Sciences*, 30(3), 187-188. Retrieved from <https://www.semanticscholar.org/paper/Intelig%C3%A2ncia-Artificial-e-Machine-Learning-em-%C2%AD-Uma-Mesquita/de76b1ff-87b1ac90ded12329c58ad69e-aff0f772>
14. Nartissa, I. (2012). Openness and knowledge as leading tendencies in development of micro enterprises. *Economics and Management*, 17(4), 1579-1584. <https://doi.org/10.5755/j01.em.17.4.3032>
15. Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the future – big data, machine learning, and clinical medicine. *The New England Journal of Medicine*, 375(13), 1216. <https://doi.org/10.1056/NEJMp1606181>
16. Paiva, O., & Prevedello, L. (2017). O potencial impacto da inteligência artificial na radiologia. *Radiol Bras*, 50(5), 5-6. <http://dx.doi.org/10.1590/0100-3984.2017.50.5e1>
17. Palmatier, R. W. (2017). Marketing research centers: community, productivity, and relevance. *Journal of the Academy of Marketing Science*, 45(4), 465-466. <https://doi.org/10.1007/s11747-017-0538-5>
18. Poersch, J. M. (2004). Simulações conexas: a inteligência artificial moderna. *Linguagem em (Dis) curso*, 4(2), 441-458. Retrieved from http://www.portaldeperiodicos.unisul.br/index.php/Linguagem_Discurso/article/view/273
19. Sarfati, G. (2016). Prepare-se para a revolução: economia colaborativa e inteligência artificial. *GV Executivo*, 15(1), 25-28. Retrieved from <https://rae.fgv.br/gv-executivo/vol15-num1-2016/prepare-se-para-revolucao-economia-colaborativa-inteligencia-artificial>
20. Sharma, R., Mithas, S., & Kankanhalli, A. (2014). Transforming decision-making processes: a research agenda for understanding the impact of business analytics on organisations. *European Journal of Information Systems*, 23(4), 433-441. Retrieved from <https://link.springer.com/article/10.1057/ejis.2014.17>
21. Steenburgh, T., & Ahearne, M. (2018). How to Sell New Products Focus on learning, not performance. *Harvard Business Review*, 96(6), 92-101.
22. Wetherbe, J., & Eckhardt, J. (2014). Making business school research more relevant. *Harvard Business Review*. Retrieved from <https://hbr.org/2014/12/making-business-school-research-more-relevant>
23. Zoltners, A. A., Sinha, P., & Lorimer, S. E. (2018). How to Downsize Your Sales Force. *Harvard Business Review*, 4. Retrieved from <https://hbr.org/2018/04/how-to-downsize-your-sales-force>