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ARTIFICIAL INTELLIGENCE SYSTEMS – THE LONGA MANUS OF MANAGERS

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ABSTRACT

The revolutionary phenomenon of artificial intelligence is a reality that permeates all areas of knowledge and all sectors of activity. Commercial management is one of the activities that can benefit most from the use of artificial intelligence systems and, therefore, managers increasingly need to know this phenomenon very well, both from a technical and operational point of view. If the advantages are obvious: i) enormous analysis capacity; ii) fast operations; iii) objective decisions; iv) comparative data analysis; v) risk prediction; vi) proposals for complete and targeted solutions, among many others, we cannot neglect the lack of risk and responsibility for the manager who, based on solutions indicated by artificial intelligence systems, makes decisions that, among others, may involve risk and losses for society or, even, calling into question certain legal principles and values. This article intends, albeit in a very general way, to point out the main legal challenges to these decisions which, despite being based on artificial intelligence systems, have managers as their sole authors. This will have to be the case, at least, until the replacement of the human manager by the cyber manager.

Index Terms—"artificial intelligence"; "machine learning"; "management of commercial companies.

I. INTRODUCTION

The world has experienced a technological evolution never experienced before, the consequences of which are visible in all social dimensions. Technology is now the basis of advancement and growth. Artificial Intelligence (AI) is, at this moment, one of the maximum exponents of this new reality, which brings with it, above all, new opportunities and many gains. For companies, it is, as we know, an essential and indispensable tool. Ignoring it will certainly mean the death of any company. Managers see AI systems as the panacea for curing all ills and the key to huge profits. However, there are several dangers that lurk and the responsibility that may fall on managers using these AI systems, as part of their management task.

Therefore, it's mandatory regulate this matter. The European Union, aware of this need, has been paying attention to this problem, with commitment since 2018, and, because of several studies, has presented important results in this area, with particular emphasis on the Artificial Intelligence Regulation, approved by the European Parliament on March 13, 2024 [1]. Before that, in 2008, the European Commission, in the "Communication from the Commission" or "Artificial Intelligence for Europe", questioned what, after all, AI was, listed the main challenges, and specially listed, with hope for a better future, the advantages of AI and ended with the phrase, which, in our opinion, sums up very well what should be the main focus of all this development: "Together, we can place the power of AI at the service of human progress."

In 2019, in continuation of the work, the High-Level Expert Group on AI, worked on two main deliverables: i) "ethics guidelines for trustworthy AI", ii) "policy and investment recommendations for trustworthy". The experts delved deeper into the concepts, sought to find the way so that AI could be understood and above all used by everyone, even if they are not experts in the field [2].

In 2020, was published the "White Paper on AI - a European approach to excellence and trust", where the European commission summarizes the concept of AI as being "a set of technologies that combine data, algorithms and computational capacity" [3].

In 2021, the European Commission presented the "Proposal for a regulation on the European Parliament and of the Council laying down harmonised rules on AI (Artificial Intelligence Act)" [4], which, as mentioned, was finally approved in March 2024, after a long period of negotiations and changes, and later, on April 19th, corrected. [1].
Is precisely with this legal framework, at the level of the work of the European Union, we will attempt, considering also the Portuguese legal system that regulates company law, to point out some of the main challenges that the use of AI presents to managers of commercial companies. In summary, we intend to understand the potential of AI in the administration of commercial companies and, above all, how managers should make use of these tools in order to achieve the necessary balance between the added value resulting from technologies and the guarantee that the values and principles that underlie the legal systems in application are fully respected.

II. CONCEPT AND TYPES OF AI

In accordance with what is described in the AI Act (12th point of the "Whereas"), "the notion of 'AI system' in this Regulation should be clearly defined and should be closely aligned with the work of international organisations working on AI to ensure legal certainty, facilitate international convergence and wide acceptance, while providing the flexibility to accommodate the rapid technological developments in this field". From the same text there is no doubt that the most important characteristic of AI systems is the fact that they can learn on their own and infer results and conclusions on their own. The importance of this competence is such that it allows these systems "obtaining the outputs, such as predictions, content, recommendations, or decisions, which can influence physical and virtual environments, and to a capability of AI systems to derive models or algorithms from inputs or data" [6].
From the point of view of the mere user of AI systems, without precise technical rigor at the IT level, we can say that there are three types of AI, depending on the characteristics that the respective systems present and the solutions they can achieve: i) artificial narrow intelligence; ii) artificial general intelligence; iii) artificial superintelligence.
The artificial narrow intelligence (ANI)'s main characteristic is that it can store astronomical amounts of data, carrying out preconceived tasks and providing answers to certain problems, depending on the data that is loaded into the system. ANI is based on the concept of machine learning, which, as the name suggests, summarizes the machine's ability to learn on its own, thanks to accumulated capacity and knowledge. It is usual to define the concept of ANI mention that this type of systems has a learning process identical to that of a child [7] [8]. Although they may go unnoticed, these systems are present in practically all sectors of activity and represent enormous added value in the most important areas of our lives: health, education, transport, essential services. Despite being extremely useful, we cannot forget that these systems have a learning capacity limited to the algorithm or the level of the software in use and, therefore, cannot respond to complex problems, especially those problems that involve combining technical knowledge and knowledge of lived experience, in particular subjective values of different natures (social, economic, legal, among others). In these cases, decisions may arise that are objectively perfect, but subjectively terrible. This balance is often considered by human beings who make decisions based on knowledge and basic values and principles for the development of a conscious society that cares about humanity.
Given technological developments, it is expected that, in just a few years, around 10 to 15, the so-called artificial general intelligence (AGI) will be operational. The main difference between ANI and AGI is that the latter is based on autonomous systems, which by themselves can solve complex problems, without requiring human intervention for each new problem. Basically, we are at the next stage of AI that can be compared to an adult, that is, capable of solving new problems by correctly combining all accumulated knowledge. We will elevate, with AGI, the way of living with AI. Reliable systems with incalculable capabilities at the service of humanity (hopefully), capable of creating new machines and evolving without external help [9].
The so-called artificial superintelligence (ASI) is the most feared for humanity as it allows us to confirm that creation surpasses its creator! In fact, it is expected that ASI systems will be equipped with intelligence greater than that of humans, at all levels. This means that ASI systems can do everything that ANI and AGI systems do, but they exceed their capabilities by integrating the subjective element of emotion and feelings. They are expected to be able to interpret human emotions and experiences and to develop cognitive abilities and even their own tastes.
They will have the ability to think for themselves in all areas of knowledge. These machines are the embodiment of knowledge at its maximum exponent, being able to replace man in practically all tasks. In the case of commercial companies, we could assume that the human administrator could be replaced by the robot administrator who, now, would be able to make decisions objectively, quickly, effectively and without errors and to do so without disrespecting or violating social, economic, environmental and legal.

III. THE USE OF AI IN CORPORATE MANAGEMENT – ADVANTAGES, DISADVANTAGES AND RISKS OF CORPTECH

Considering the Portuguese legal system, as is the case in most European and Anglo-Saxon legal systems, the management of commercial companies is the responsibility of a body called administration or management (the legal determination depends on country to country). Except in smaller companies, which may have a single director, this body is, in most cases, a collective body, composed of more than one person.
The main obligation of managers lies in managing the company, and to this end they must carry out all acts that are necessary to achieve this purpose and, above all, to achieve the corporate purpose of the company they manage. They must always (and only) act in the interests of society, considering, however, the interests of partners and other interested parties, such as workers and stakeholders.
the activity of managing implies the assumption of risks for managers and even for society. Risk is one of the main characteristics of business and, therefore, everyone knows that it is common to have to take risks. Despite this, it is important to clarify that managers cannot exceed certain legal limits, under penalty of civil and even criminal liability [10].
managers must act with duties of care and loyalty.
Despite these legal orders, the truth is that have come to light countless cases of corruption and harmful management, driven, almost always, by personal greed, with very serious losses for countless people. The image of managers is not, nowadays, the best. It is with suspicion that people look at this profession that has other people's money in its hands as if it were the government of a small (or large) country.
If technology is impartial, objective, fast and with exceptional analysis capabilities, it will certainly be a manager with qualities superior to those of human managers.
We will see if that is actually the case. But one thing is certain and we can say: technology is a strong ally of management. In fact, the application of technologies to corporate governance – corporate technologies or corptech for short – is an increasingly present reality [11]. We talk about the possibility of applying big data systems to corporate management analytics, artificial intelligence, machine learning, blockchain, smart contracts, among others. These systems, in addition to being able to contribute to the company's current decision-making, can also be applied to specific matters of corporate governance, such as the sensitive matters of managers' remuneration, the appointment of certain people to certain positions, the relationship with investors, in addition to other possibilities.
But the question we must ask is: whether with AI we will be able to eliminate corruption, fraud and financial engineering that, in recent years, have led to huge financial scandals and bankruptcies of giant companies?
Unfortunately, we think that AI is not a panacea for all the ills of managing companies and will be able to eliminate the risks inherent to the activity of managing itself, which flourishes in a very specific environment and with variables of such an order that they are not susceptible to being learned by machines. with how quickly they appear.
In other words, we do not doubt the usefulness of using AI systems in management, as we will demonstrate below, but we think that there are still some risks and dangers that need to be considered.
First of all, it is important to specify that autonomous learning by the machine starts from the information given to it. Basically, the same thing is to say that a child will not learn to read correctly if he is not taught the alphabet correctly or that a chef will hardly be able to prepare high quality food with weak or spoiled ingredients.
This means that there is a huge risk of a dangerous bias in information. It is therefore important to ensure that the data that feeds the AI system is correct and sufficient so that the machine can learn correctly and make decisions based on correct facts. If this is not the case, the decisions will not be correct and as they benefit from being understood as good, better than those made by humans, the risks are even greater.
Considering that AI systems are based on thousands of connections, the decision process is not truly transparent nor can it be understood where and why that particular decision was made. Thus, this lack of transparency prevents the decision from being justified or based on more than the simple fact that it was taken by the AI system. On the other hand, it also does not allow errors to be corrected, as it is not known which path was taken until the decision was made.
In addition to the above, another danger constantly hovers over the management of commercial companies (and of all institutions, in fact): the risk of cyberattacks.
It is a known fact that there has been an exponential increase in the practice of cybercrime, manifested particularly in recent years, after the pandemic caused by COVID-19 and the start of the war in Ukraine.
Managers are responsible for taking the necessary measures to prevent cyber-attacks and, above all, to minimize losses in the event of an attack. The manager must therefore adopt cybersecurity measures appropriate to the company he manages. You will have to strike the right balance between the investment to be made in this area and the benefits to be derived from the adoption of these defence mechanisms. What we intend to affirm is that the role of managers is now to take the necessary steps to protect the company they generate against cyber-attacks and to do so they must ensure that they acquire the appropriate cybersecurity systems, which monitor the actions of their employees. and that provides them with the correct information to avoid exposure to dangers of this nature and that controls the potential damage caused in the event of a

cyber-attack. These measures are not additional measures that the manager may or may not observe, but rather measures that complete his natural duties of diligence and of care and to act as a diligent manager focused on achieving the social interest.
A good management in this area implies that the manager has technical knowledge in cybersecurity matters. If he wasn't the necessary knowledge, he must surrounds himself with experts who can assist him in these decisions. On the other hand, the manager must scrupulously observe the recommendations that are being issued by various national and international entities on these matters. For example, to avoid ransomware, phishing, smishing and vishing threats, it is recommended to provide training to all employees so that they are not subject to phishing actions, warning them of the dangers of browsing pages with questionable security. It is also important to make backup copies about all relevant information on non-networked systems. Employees must also be aware of the reaction plans to be adopted in the event of a cyber-attack so that, at the first warning sign, they can use them and prevent the spread of the attack. Information, awareness and prevention are the keywords for success or, at least, for important damage control.
As we have proven, the use of AI systems will be useful in the management of societies, despite the risks involved. It is now important to analyse the modalities in which this use of AI systems is revealed within the scope of management [12].

IV. MODALITIES OF USING AI IN THE MANAGEMENT OF COMMERCIAL COMPANIES

A. Robotic or artificial consultancy – the "ciberadvisor" Submit your manuscript electronically for review.

The first modality we intend to highlight is the one based on AI systems that provide artificial consultancy. This modality is also known as cyberadvisor.
The concept of consultancy is much broader, but in a simple way we can say that consultancy exists when specialized advisory services are provided. There are specific consultancies, also related to AI systems, which we will not explore here (such as robotic financial consultancy and robotic investment consultancy).
The manager has the obligation to manage the company (well), which involves gathering all the information necessary to make decisions. As he is certainly not knowledgeable about all the matters he deals with and about which he has to make decisions, it is usual, not to say mandatory, for the manager to use consultancy services. The provision of consultancy services has grown immensely in recent years and there are even companies whose activity is precisely to provide these services in different areas (financial consultancy, legal consultancy, environmental consultancy, among others). Depending on the specific situation, we may be talking about services with high prices and that cannot always be provided as quickly as desired. However, AI systems have demonstrated that, in several areas, they can provide a true and useful service. consultancy that could be much faster, more effective, more objective and above all cheaper than that provided by human consultants, just think about the astronomical processing, data processing and analysis capabilities that they are recognized for.
We cannot forget that, in this modality, we are exploring the possibility of basic use of an AI system. In any case, the system will always need to be properly programmed, which means that it will have to be fed with data. As we know, this process of uploading data to the system, to feed the algorithm, is essential so that the answers it returns are correct and appropriate. The manager can use these AI systems through an intermediary or they can choose to buy an AI system that is already on the market or even develop their own AI system. Obviously, this last possibility will be the one that will bring the most return, as it will be completely adapted to the reality of the company. However, it will undoubtedly be the one that requires the greatest investment and brings with it greater responsibility during the programming and execution process. In turn, the use of an intermediary is also a possibility whose main advantage is the fact that, normally, it is a service provider that feeds the algorithm with a very complete database, as it makes use of the data of all users, exponentiating the content it presents. We must draw attention to the fact that these are generalized systems, widely disseminated and accessible to almost everyone. This means that they may not be a real added value for the specific company and, on the other hand, they are fragile and less secure systems as they are more studied and more subject to cyber-attacks.
The possibility of purchasing an AI system is also interesting and may be appropriate. They are normally easily accessible, available on online platforms, at attractive prices.
The most important thing is to understand which AI system is best suited to the company. The choice of system is up to the manager and it is extremely important to know how to invest in the right system. In other words, buying the most expensive AI system on the market may not be a good management decision if it is not suitable for the company. The same reasoning will apply to the cheaper system. It is, therefore, up to the manager to properly consider and taking into account all the specific knowledge he has of the specific company which is the best system, that is, the one from which the company will benefit the most.
Even so, it is obvious that the development of the AI system itself is always the most appropriate for the company as it is specifically based on its needs. However, as mentioned, it involves a very large investment, only accessible to companies with large capital. This evidence could increase the gap between large and small companies as the former have more financial resources at their disposal to be able to invest in this area. We

always find ourselves in the same vicious circle in which companies with the most difficulties end up not being able to access systems and technologies that could boost the business.
After choosing the AI system to be a consultant to the manager, it is imperative to understand is whether AI systems can be good advisors to managers and what consequences may arise if the advice has led to a harmful decision.
It should be noted that these AI systems must always be understood as co-pilots and autopilots. In other words, they will always be assistants to the manager, but they should not replace the manager. It is the manager who is responsible for managing society and to do so he must use all the tools that allow him to make good decisions. AI systems are, nowadays, essential tools in this matter.
B. Hybrid administration and delegation, in AI systems, of certain powers attributed to managers

This modality provides for the possibility of the AI system assuming the role of advisor on the board of directors. He is no longer just a co-pilot of decisions but a true pilot with voting rights. This modality is not fiction and has already been tried in reality.
The first known, widely publicized case occurred in 2014, in Hong Kong, with the appointment of VITAL (Validating Investment Tool for Advancing Life Sciences) to the board of directors of Deep Knowledge Ventures. In certain matters, the algorithm was given voting rights, on an equal basis with other administrators.
In 2016 it was time to appoint Alicia T., also with voting rights, to the management of Tieto, a Finnish company. In 2018, it was announced that the "Einstein" AI system was usually "present" at SalesForce board meetings.
VITAL is an AI system designed specifically for the life sciences industry, which uses advanced natural language processing (NLP) and machine learning algorithms to transcribe and analyse scientific data arising from different sources such as meetings and lectures with high accuracy.
"TIETO" was "the first Nordic company to appoint has appointed Artificial Intelligence as a member of the leadership team of its new data-driven businesses unit". We are talking about ALICIA T. which, according to TIETO "will help the management team to become truly data-driven and will assist the team in seeking innovative ways to pursue the significant opportunities of the data-driven world" [13].
"Einstein" is an AI system developed by Salesforce, especially designed to work with CRM (Customer Relationship Management) software. Its way of operating is based on the use of machine learning algorithms and can perform countless data analyses, make predictions, provide recommendations and automate tasks in the Salesforce ecosystem. With this system it is possible to quickly understand which leads can become customers, channeling the teams' efforts towards these potential customers to the detriment of those with fewer possibilities. It can respond autonomously to emails and direct messages from customers (in chat). Discover trends and analyse patterns in order to provide the best information to the decision maker. But more than that, what was stated was that based on these answers they would have the right to vote on certain decisions [14].
In June 2020, developed by OpenAI, one of the biggest AI phenomena emerged worldwide: chatGPT, which, in just two months, reached more than 10 million users. It was the fastest growth ever. In March 2023, Jackson Greathouse Fall used ChatGPT to find out the best way to turn 100 euros into a million-dollar business. A few months later, João Ferrão dos Santos, a Portuguese entrepreneur, created an online company entirely designed by the ChatGPT4 (AIsthetic Apparel). This company, according to its founder, will always be managed by him and other administrators, but above all by the real creator: ChatGPT [15].
These cyber administrators can serve as the board of directors of these companies in the countries where they have their registered offices. However, not all legal systems allow this. In fact, for example, among others, the Portuguese, Spanish and German legal systems do not allow bringing AI systems with the quality of true managers into administration. This possibility is not contemplated, firstly because the exercise of the management function always belongs to an individual, even when the administrator is a legal person, management must be carried out by an individual.
There will probably be legal developments that allow us to follow these technological developments, but there are always precautions to be taken and issues to be addressed, especially in terms of liability. For example, we have to understand who to hold responsible when the cyber manager causes damage to society and third parties, we have to understand how to remove the cyber manager and who controls it.
C. Replacing human administrators with AI systems – the "cybermanager"
The full replacement of human managers with cyber managers is still a future. In moral and ethical terms, we hope that, in this matter, there will not be a full replacement. There are decisions that only humans, with all their knowledge and senses, can make.
Companies must be more humanized and not completely dehumanized. The centre of analysis cannot just be profit and increased productivity. The focus has to go further and think about the well-being of people, the company and outside the company. Only in this way can we build a future with humanity. This does not mean that we are not aware that AI systems are a real asset to the functioning of society and general development. In company management, it is imperative to make use of these systems, but always as co-pilots, or at most as partners, and not as commander.

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