MAIN CONCEPTS ABOUT ARTIFICIAL INTELLIGENCE. GENERATIVE AI

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Abstract: *The purpose of this article is to provide both researchers and practitioners with a better understanding of the concept of artificial intelligence, by explaining in a simplified way this concept and related concepts, since understanding the concept of artificial intelligence is very important in the current socio-economic context. This paper is a literature review. The main articles in the literature that define the concept of artificial intelligence or related concepts of artificial intelligence have been analyzed. This article provides its own analysis of the concept of artificial intelligence. The analysis is deep, as proof the article does not just summarize what is already written, but provides a holistic explanation of artificial intelligence with the aim of clarification for researchers and practitioners.*

Keywords: *Artificial Intelligence, Machine Learning, Generative Artificial Intelligence.*

JEL Classification: *A10*

1. Introduction

Artificial intelligence is a concept that has revolutionized the whole society. It can, in a simplistic way, be explained as the ability of machines to mimic human behaviors (Hein et al., 2020; Kok, 2022; Sheikh et al., 2023).
Due to its numerous advantages, artificial intelligence is being used in all fields of activity. In the economic field, artificial intelligence has profoundly changed all its fundamental principles, thus changing the way of doing business (Di Vaio et al., 2020). Nowadays, with the help of this powerful technology, managers can achieve their primary goal, which is to make the activities undertaken more efficient, either by lowering costs or by higher efficiency, both of which are offered by the use of artificial intelligence (Lazăr et al., 2024).

The attention of researchers has been focused on artificial intelligence long before it became popular. The first studies on AI were conducted more than 40 years ago (Di Vaio et al., 2020), even though AI became known among the general population, especially with the launch of the ChatGPT app in late 2022 (Korneeva et al., 2023). However, it is considered that the study of artificial intelligence is still in its infancy (Di Vaio et al., 2020). Therefore, basic concepts such as the definition of AI or the categorization of its main features are not well established; as evidence, there is currently no unanimously accepted definition for this type of intelligence (Wang, 2019).

Observing this lack of explanation of basic concepts concerning the most widely applied technology worldwide, we considered it proper to realize explanations of some key concepts regarding AI, such as its definition, main traits, and main subsets. Also, since artificial intelligence is loosely defined without an unanimously accepted definition, there are numerous articles offering particular definitions for this concept, thus creating confusion among the general public (Kelly et al., 2023). Bearing also in mind that artificial intelligence has become an extremely important one for the world economy, with the contribution of this field created around AI expected to reach 15.7 trillion dollars by 2030 (Murphy et al., 2021), we consider it essential to clarify these concepts.

The article is structured as follows: the second chapter presents the methodology used, followed by the research results, in which the definitions, main features, and subsets of artificial intelligence are presented, emphasizing the concept of generative artificial intelligence, due to its increasing use. The article concludes with a presentation of the conclusions.

2. Methodology

This paper conducts a literature review, analyzing some of the most essential sources discussing artificial intelligence, generative artificial intelligence, and its impact on society. The research process started by identifying relevant articles through a Google Scholar search. Specifically, we searched for the terms “artificial intelligence” OR “AI” and “generative artificial intelligence" and “definitions”, in March 2025 and retrieved approximately 10.200 results. It can be observed that although the study of artificial intelligence is relatively in its infancy, there are numerous articles analyzing this topic, so we considered it necessary to filter them. The main filter used was the year of publication, including in the analysis only articles published after 2019. Applying this filter resulted in 9.230 articles. We considered this criterion relevant because the field of artificial intelligence is evolving so rapidly that some of its features fundamentally change quickly and become irrelevant. Only one article is an exception to this criterion, which is (Simon, 1995). The reason for including this article is that it provided an extremely well-defined definition of artificial intelligence, being cited over 400 times.

Another selection criterion was to provide proper definitions for the concepts, of artificial intelligence, generative artificial intelligence or their underlying characteristics, by analyzing the title and abstract of each article. Thus, after applying these filters we included 132 articles in the analysis. Of these articles, 31 were not accessible, and the remaining articles were read in full to determine whether or not they were relevant to our study. Ultimately, 22 articles were included in the research. The research continued with extracting information from the articles that passed the selection filters. We continued their analysis, focusing on information valuable for our research, such as definitions of the notion of artificial intelligence, or classifications of types of artificial intelligence.

3. Results

3.1. The history of AI

Historically, the development of artificial intelligence came about following an extremely important event in the evolution of the entire economy, which was the invention of the digital electronic computer in 1937 (Wang, 2019). Immediately after the creation of this revolutionary tool, people realized that it could undertake numerous types of tasks, not just mathematical calculations most of which were considered to be specific to human activity (Wang, 2019). Although this technology has become more widely known in the last ten years, the foundations of artificial intelligence were laid in the 1950s, when several researches were carried out to demonstrate that human intelligence can be reconstructed by computers (Hein et al., 2020; Simon, 1995). In 1956 the first definition of the concept of artificial intelligence was also given by John McCarthy who defined it as "the science and engineering of making intelligent machines" (Collins et al., 2021).

Noting that the foundations of artificial intelligence were laid in the middle of the last century, and at the same time taking into account that the field of technology is in a continuous dynamic, it is natural that the form and features of artificial intelligence have changed profoundly over time, the one today retaining only a small part of the one that existed more than 70 years ago. The first form of artificial intelligence goes by the name of Narrow Artificial Intelligence (Saghiri et al., 2022) and is particularized by the fact that it is programmed to perform well-determined tasks in which there are no unknown factors. Since there was a desire to perfect artificial intelligence, an important evolution of artificial intelligence in terms of technology is observed, leading to, General Artificial Intelligence (Saghiri et al., 2022), which possesses a certain consciousness, and is equated by many researchers in the field with human intelligence. The next stage in the evolution of artificial intelligence involves going beyond human thinking capabilities and is called “Higher Artificial Intelligence" (Saghiri et al., 2022).

Analyzing the evolution of artificial intelligence over time, one can see a huge progress, reaching the last known stage of superior artificial intelligence to surpass human potential. Reaching this technological level has generated many opinions in society, some of them supporting the continued development of artificial intelligence, which is seen as a helper of man, but other opinions are against the development of this technology, arguing that artificial intelligence threatens the proper development of human society.

3.2. Definitions

Numerous popularly known concepts in both economics and other fields encounter a problem when discussing their definition, as specialists in the respective fields do not agree on a single explanation for them (Kelly et al., 2023). Artificial intelligence faces the same problem, as there is no universally accepted definition of this concept (Kelly et al., 2023; Wang, 2019). One of the main reasons for this lack is considered to be the fact that the notion of artificial intelligence is relatively new, so there has not been enough time to clarify it (Wang, 2019).

However, in the case of artificial intelligence, sustained efforts are being made by many researchers and practitioners in the field to reach a common denominator regarding the meaning of this concept (Ofosu-Ampong, 2024).

After analyzing more than 30 articles dealing with the topic of artificial intelligence, we identified eight articles that provide a concrete definition of the notion of artificial intelligence. Depending on the emphasis given by the authors, we made comparisons between the main definitions identified. For better observation of the similarities and differences between them, we grouped the definitions according to the emphasis placed within them, thus generating three categories: imitation of human behavior, learning, and autonomy.

Imitation of human behavior: This category includes the definitions offered by (Hassani et al., 2020; Kok, 2022; Sheikh et al., 2023) as these authors emphasize the ability of artificial intelligence to imitate human behavior, considering it as a defining feature for artificial intelligence.

Learning: This category includes the definitions provided by (Enholm et al., 2022; Khanzode & Sarode, 2020; Nikitas et al., 2020) as they present artificial intelligence with a focus on its ability to have its way of thinking, analyzing, and learning. Artificial intelligence can learn from its own experiences and thus become increasingly influential.

Autonomy: This category includes the definitions offered by (Banh & Strobel, 2023; Berente et al., 2021) as they emphasize the ability of artificial intelligence to make decisions autonomously, i.e. without any outside intervention, thus detaching itself from human control.

Analyzing the main definitions of artificial intelligence, we noticed some common aspects that the authors emphasized in their definitions. (Banh & Strobel, 2023; Kok, 2022; Sheikh et al., 2023) present artificial intelligence in their definitions with a developed ability to imitate human behavior. Banh & Strobel, (2023); Berente et al., (2021); Nikitas et al., (2020) emphasize a common aspect illustrated by the ability of artificial intelligence to learn.

Following our research, we came up with our definition of artificial intelligence: Artificial intelligence is the ability of machines to mimic human behaviours and attitudes and to take actions that are naturally performed by humans, all with the help of complex technologies.

3.3. Features Artificial Intelligence

Since the notion of artificial intelligence is essential in the current economic context and beyond, we consider it important, for a deeper understanding of this concept, to present the fundamental features of artificial intelligence.

One of the defining traits of artificial intelligence is represented by its ability to mimic human behaviors, to perform actions that naturally, humans did (Banh & Strobel, 2023; Kok, 2022; Sheikh et al., 2023). This trait is fundamental to artificial intelligence, and is also the reason why it was created: to help humans in accomplishing certain tasks, sometimes even replacing them. With this feature, artificial intelligence has become a highly useful tool for the whole of humanity, regardless of the field of activity, because it can be configured according to present needs.

Another equally important feature of artificial intelligence is illustrated by its ability to learn, even from its own experience (Banh & Strobel, 2023; Berente et al., 2021; Nikitas et al., 2020). This trait provides a significant advantage to artificial intelligence as it, through high- performance technologies, continuously improves itself through learning.

Autonomy is another defining trait of artificial intelligence. It implies the ability of intelligence to make decisions and act autonomously without human intervention (Berente et al., 2021; Ofosu-Ampong, 2024). Certain choices or actions are taken not only without human intervention but even beyond human awareness (Ofosu-Ampong, 2024). This trait shows how evolved the technology used in this type of intelligence is, surpassing even human intelligence, paradoxically, considering who the creator of this intelligence is.

Analyzing the features of artificial intelligence, we believe that it brings a great advantage to all those who use it. First of all, it considerably facilitates the work that people have to do in various fields of activity, simply because they can rely on the expertise it provides at any time. Also, by using this artificial intelligence, which performs multiple tasks autonomously, uninfluenced by human consciousness, people can enjoy purely technological sincerity and action.

Thus, the fundamental characteristics of artificial intelligence make it an indispensable technology for the development of human society.

3.4. Subset of AI

Artificial intelligence has developed a lot in the last decade, so an analysis of this concept is carried out in more depth, dividing the whole, and analyzing component technologies of artificial intelligence. Thus, we will examine two critical components: deep learning and machine learning.

Machine learning is an innovative technology that is mainly concerned with the development of algorithms that enable learning from one's own experience (Banh & Strobel, 2023). This feature is also specific to human learning (Helm et al., 2020). Compared to human intelligence and learning, machine learning enhances its learning and analytic abilities using advanced technologies. Over time, through much practice machine learning manages to predict specific outcomes and provide solutions to various exercises autonomously without human intervention (Banh & Strobel, 2023; Helm et al., 2020).

Autonomy in processing data and providing solutions, as well as learning from one's own experience, requires high-performance technology. To better understand how this machine learning works, (Stewart et al., 2020) categorized the algorithms used by Machine Learning to observe the categories of learning that they determine. The first category is called, supervised learning" (Ofosu-Ampong, 2024; Stewart et al., 2020) and is characterized by the fact that it uses existing data to refine itself in generating new predictions or solutions for different requirements. The second category is called, unsupervised learning" (Ofosu- Ampong, 2024; Stewart et al., 2020) and is characterized by the fact that it lacks a well- defined outcome variable, so that classifications within it are also not performed according to well-drawn standards.

Deep learning is an extremely powerful technology and is considered the most potent subcategory of Machine Learning (Banh & Strobel, 2023). It has developed,

similar to human anatomy, in particular the human brain (Banh & Strobel, 2023; Murphy et al., 2021) neural connections to play back various patterns and patterns and to directly realize correlations. Deep learning also manages to process enormous sizes of data, from any domain including photos or videos (Banh & Strobel, 2023).

These technologies are helping artificial intelligence to constantly evolve and provide higher quality services like humans.

3.4.1. Generative AI

Generative AI represents an evolution of artificial intelligence, by the simple fact that before this change AI was viewed as a tool without consciousness, with a single role to assist humans in decision-making. Nowadays, with the help of this new technology, artificial intelligence manages to generate innovative outputs autonomously (Feuerriegel et al., 2024) Generative artificial intelligence has emerged as an effect of the development of learning techniques used in classical models of artificial intelligence, particularizing itself by emitting solutions similar to those naturally offered by human intelligence. The solutions offered are creative and offered in complete agreement with the external input (Banh & Strobel, 2023). By utilizing the solutions offered by this type of intelligence, considerable advantages can be gained in terms of streamlining activities as well as creativity. Generative artificial intelligence is currently being used in numerous fields of activity, including healthcare and education (Banh & Strobel, 2023).

Feuerriegel et al. (2024) explain generative artificial intelligence as an accumulation of computational technologies that generate new instances of data that mimic the ones trained with, but are essentially new and original. The main types of actions that generative artificial intelligence can take, according to Feuerriegel et al. (2024) are:

- Creating new writing styles;
- Creating new images from various textual descriptions: based on the input information, generative AI can transform a simple text into a completely new, original image. This makes the human imagination tangible;

Code generation: based on the information already retained, generative AI can provide code for different tasks, greatly facilitating the work involved in the software programming process. Realizing this deep analysis of the notion of generative AI, we noticed its particular importance, especially in the development of the relationship between human beings and artificial intelligence. Another observation is illustrated by the fact that the development of generative AI will profoundly impact the environment in which we live today. Still surely, the two environments will evolve concurrently so that the state of equilibrium is preserved.

3.5. Social Impact of AI

Artificial intelligence is not only a set of high-performance technologies with which a non- human intelligence has modified its abilities so that it behaves similarly to humans but also an economic and social transformation of society as a whole.
Any change, to be successful and to be implemented, needs the acceptance of the parties that are affected by the effects of that transformation. This also applies to artificial intelligence. It entered the market with a promise represented by the

promise that it would help humans perform their tasks (Korneeva et al., 2023). However, currently, society is divided when it comes to the acceptance of artificial intelligence. On the one hand, supporters of this technology note the significant advantages it offers society, especially the easing of human tasks accomplished by delegating to machines. Artificial intelligence can quickly take over repetitive tasks (Lazăr et al., 2024), which are often real challenges for humans. On the other hand, some voices are against the development of artificial intelligence because they consider it, perhaps also due to a profound misunderstanding (Kelly et al., 2023) a threat to the development of the whole humanity (Korneeva et al., 2023). To better understand the points of view of both categories, we will explain in detail, based on studies, the main reasons why artificial intelligence is supported or not. We consider it relevant for the analysis of the effects that the implementation of artificial intelligence produces. These are of two types: augmentation and automation (Korneeva et al., 2023). Augmentation is one of the main arguments supporting the implementation of artificial intelligence. It represents a process whereby both humans learn from machines and machines learn from humans (Korneeva et al., 2023). By learning from each other, both parties develop, and humans use artificial intelligence to make their daily tasks more accessible and improve the quality of the services they provide. On the other hand, automation is the main reason why humans do not accept artificial intelligence.

Automation entails streamlining specific processes by machines taking over certain functions, especially those of a repetitive nature (Korneeva et al., 2023). Through this transfer of tasks, certain jobs are eliminated the main reason being that machines perform those tasks more efficiently. Because of this, fear of being replaced, some people do not accept and do not want artificial intelligence to develop (Korneeva et al., 2023). According to some studies in this field, the use of artificial intelligence is expected to increase significantly, benefiting the whole economy by increasing the global GDP by more than 7%, but at the same time the use of this technology will replace more than 300 million jobs (Feuerriegel et al., 2024).

4. Conclusions

Artificial intelligence is a technology that has revolutionized not just one field of activity, but the whole of humanity. As proof of this, regardless of people's social or economic status, everyone's daily life has been impacted by the development of this technology. In terms of its definition, there is no standard agreement, but many authors agree on a certain characteristic that explains the whole complexity of the term, namely, copying human behavior. From this characteristic, there are secondary ones, the most important of which are autonomy and the ability to learn from one's own experience. We consider these features secondary not in terms of their importance, but because they are effects of imitating human behavior, which is defined by autonomy and learning.

The use of artificial intelligence brings numerous benefits to society, both for the employer and the employee. From an economic point of view, we believe that

artificial intelligence brings only benefits to all those who implement it: managers become more efficient, and human resource costs decrease considerably. However, the development of artificial intelligence has led to numerous discussions about its social impact on society. Within these discussions, some consider artificial intelligence as a collaborator, and those who consider it a threat to their jobs. Analyzing these discussions, we believe the most effective way, of balancing society.

Thus, AI is constantly developing, and this development can lead to various ways to build human society as well. However, we recommend paying attention to the social and ethical aspects when implementing this technology to preserve the societal balance.

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