

## ARTIFICIAL INTELLIGENCE: TRANSITIONING FROM SCIENCE FICTION TO ACHIEVING BUSINESS EXCELLENCE

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### ABSTRACT

*The first entrepreneurial activities date back many centuries. Developing and managing a business does not always mean that the business is successful, moreover, not every entrepreneur has managed to reach the level of excellence. Over the years, entrepreneurial activities have become more and more diverse and the ways to develop them have required more and more research and development to identify ways to innovate. Excellence in business is not easy to achieve, depending on the field of activity it may also require invention, not just innovation. However, we see that the pace of development in the markets is one that could not have been anticipated 20 years ago on such a scale, and this development has allowed the business to evolve along trajectories that, surely, decades ago were classified as science fiction. Artificial intelligence offers countless insights, sometimes giving the impression that the means of using it are limitless and certainly constantly innovative. In this article we will briefly look at how it evolved, the advantages and disadvantages of using it and, of course, how using it leads to business excellence.*

**KEYWORDS:** *artificial intelligence, business excellence, efficiency, improvements, management.*

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### 1. INTRODUCTION

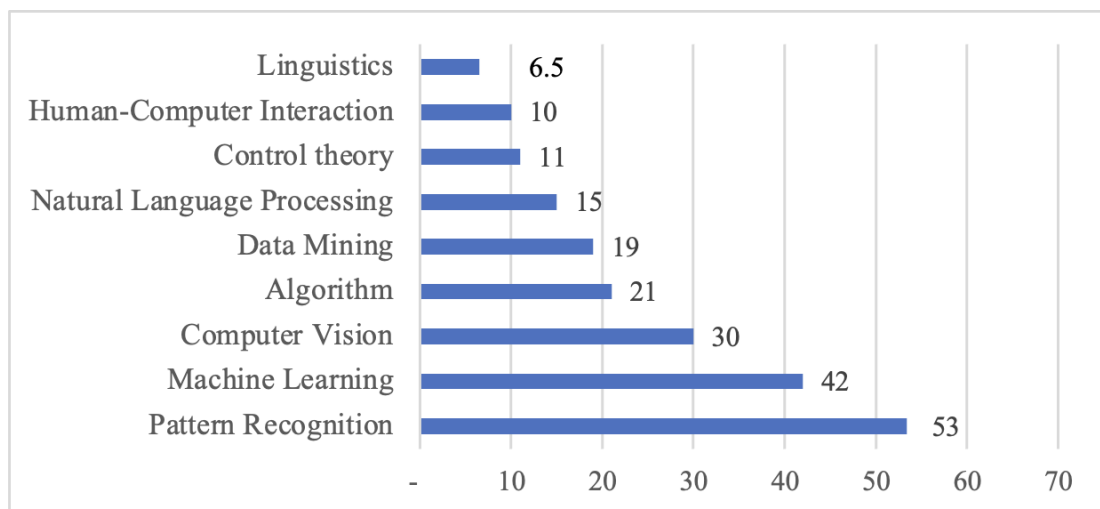
Since the advent of the first systems that worked using artificial intelligence (AI), several definitions of artificial intelligence have been formulated, trying to explain this concept as well as possible. Broadly speaking, AI is a computer system that exhibits behaviour/ performs certain requirements that normally require intelligence.

The concept of artificial intelligence appears modestly in the terminology used in 1956, as we shall see briefly in a later sub-chapter of the paper. The boom of this industry started in 2012; however, in the economy and in business this concept has started to be used and put into practice much more strongly in the last 5 years.

According to data published by Stanford University Human-Centred Artificial Intelligence (2023) the total number of publications globally during the period 2010-2021 has more than doubled - from 200,000 in 2010 to nearly 500,000 in 2021. Of these, as a percentage of the total, education-related articles account for 75.23%, followed by 13.60% of articles belonging to the non-profit sector, 7.21% in industry 3.74% relating to Government and the difference is represented by other sectors. In figure no.1 we can see the distribution of research according to the field of study.

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**Figure 1. Number of AI Publications by Field of Study in 2021 (Excluding Other AI)  
\*rounded to thousands**

*Source:* Author adaption using data from AI Index Report 2022 (Stanford University Human-Centred Artificial Intelligence, 2023)

Over the last 2 decades, AI has significantly improved the performance of manufacturing, certain service sectors and education. AI technologies have varying effects on different areas of life due to its scalability property, depending on the needs in the market (Pandit, 2022).

The level at which this technology performs is developing more and more with each quarter of each year. The possibilities are limitless and therefore companies have started to use these opportunities to increase their competitive advantage in the market, to reduce certain costs or to increase business efficiency. The steps to business excellence differ with each field of activity. But for all of them, innovation, competitive advantage and the necessary resources are needed for this combination to be successful. With the help of artificial intelligence, entrepreneurs, government officials, etc., can make significant advances over what they could achieve without these improvements. Innovations using artificial intelligence have enabled small businesses to reduce costs and increase revenues. Industry expert analysis shows that achieving excellence with AI can also be achieved through methods such as: data-driven development and advances in deep learning by AI, cloud computing, data management, and integrating AI into operations (Tariq et. al., 2021).

In a survey conducted by Deloitte AI Institute (n.d) and disseminated to business leaders, 94% of respondents believe that AI is crucial to success in the next 5 years. Also, an interesting fact (in a context where many voices believe that many employees will be out of a job once AI technology spreads) is the following: 82% of respondents mention that their employees believe the use of AI will help increase performance and job satisfaction (Deloitte, 2022).

In order to develop a business, it is necessary to consider key performance and global production characteristics such as: business excellence, consumer demands for high quality products and services, marketing, distribution of goods, information and services, new technologies, etc. In order to meet the necessary criteria for excellence, the focus should be on researching strategic managerial and leadership changes that make up a structured organisational framework (Zivanovic et al., 2023).

## 2. RESEARCH METHODOLOGY

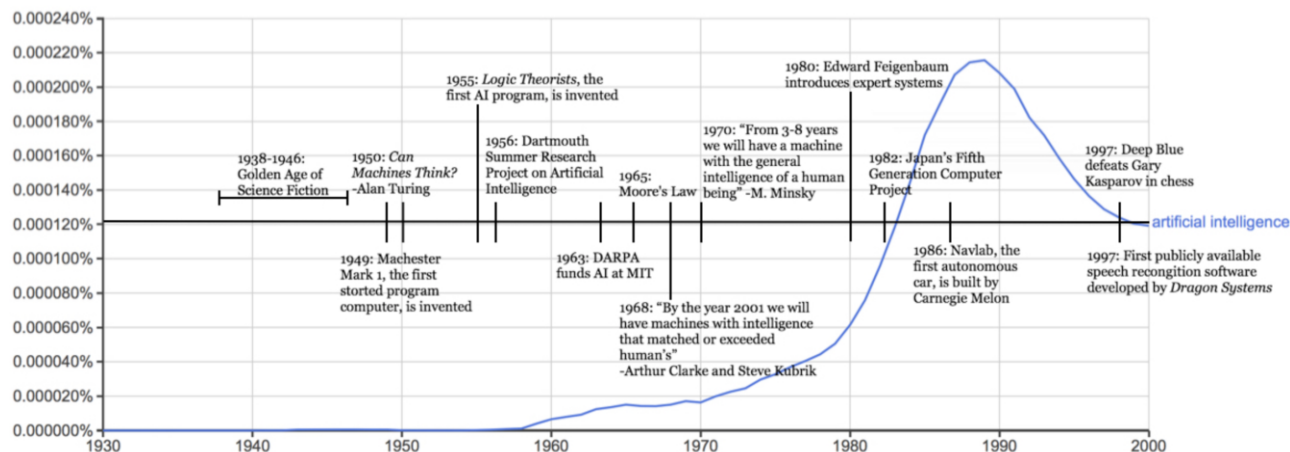
The article presented here is a synthetic analysis of the studies and research carried out, from the 2000s to the present day, as well as a review of the literature. The main purpose of writing it was to analyse the topic of `artificial intelligence` and to present the ways in which it can be used to achieve business excellence. This analysis started from the evolution of the ideas of artificial intelligence and related elements, the first moments in which it was put into practice, the different perspectives over 23 years and, of course, the future at both international and national level. At the same time, the disadvantages that have arisen with these innovations have been analysed. In terms of webgraphic sources consulted, the databases used were Web of Science, Eurostat, ResearchGate, JSTOR and the search engines used were Google Scholar, Google. In terms of studies and analyses, these came from institutions such as: Stanford University, Harvard University, PwC, Deloitte, Fobes, UNESCO, OECD etc.

Therefore, in this paper we will explore how artificial intelligence can be used as an important driver of business performance.

## 3. ARTIFICIAL INTELLIGENCE - DEVELOPMENT PROCESS

### 3.1 The history of AI

The first concepts of artificial intelligence date back many centuries; however, after 2010 we see its study on a larger scale. In recent years, however, progress has been revolutionary and the emergence of new and new ways of using it, in increasingly diverse fields, has been inevitable. In Figure 2 we can see how this science developed before the 2000s.



**Figure 2. Artificial Intelligence timeline**

Source: Anyoha (2017), <https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/>

The use of the term artificial intelligence dates to 1956, during the first academic conference given by John McCarthy. However, the journey to the destination entitled 'are machines really able to think' began long before this date. In Vannervar Bush's `As We May Think`, he proposed the idea of a system that could amplify people's knowledge and understanding. Five years later, Alan Turing is writing a paper on how machines can simulate human feints and intelligent behaviour, for example playing chess (University of Washington, 2006).

Research into building a computer that could mimic a person's behaviour well enough so that the difference could not be detected by comparison began with the Turing test. The process was seen from the beginning as difficult, but not impossible. Throughout the tests they encountered many

difficulties and the processes were slowed down and, unfortunately, the results did not seem to be as expected – Alan Turing's hope that the test would be surpassed by a computer by the year 2000 was not fulfilled.

The periods in the evolution of AI and how they unfolded can be seen in the detailed timeline below (Santos & Qin, 2019):

- 1974-1980: First "AI Winter" – as a result of ambitious expectations and unfulfilled results, the US Congress is cutting AI funding as it loses interest due to AI's obvious limitations.
- 1980-1987: Rise of Expert Systems – research and funding is being revived as a result of advances in knowledge-based expert systems.
- 1987-1993: Second "AI Winter" – following the collapse of the Lisp Machine market in 1987, the Lisp Machine hardware industry goes into a slump and governments and investors begin to cut funding to AI;
- 1993-2011: or the age of optimism, following the rise of computing power and the migration to data-driven AI.

The year 1997 marks a landmark in AI history, when chess master Garry Kasparov is defeated by *DEEP BLUE*. This was a system running on an IBM supercomputer, specially designed and expertly trained for the game of chess. Development began in 1985 at Carnegie Mellon University under the name ChipTest. The victory against the great champion is considered a landmark in the history of artificial intelligence and has been the subject of several books and films over the years (Wikipedia, n.d.).

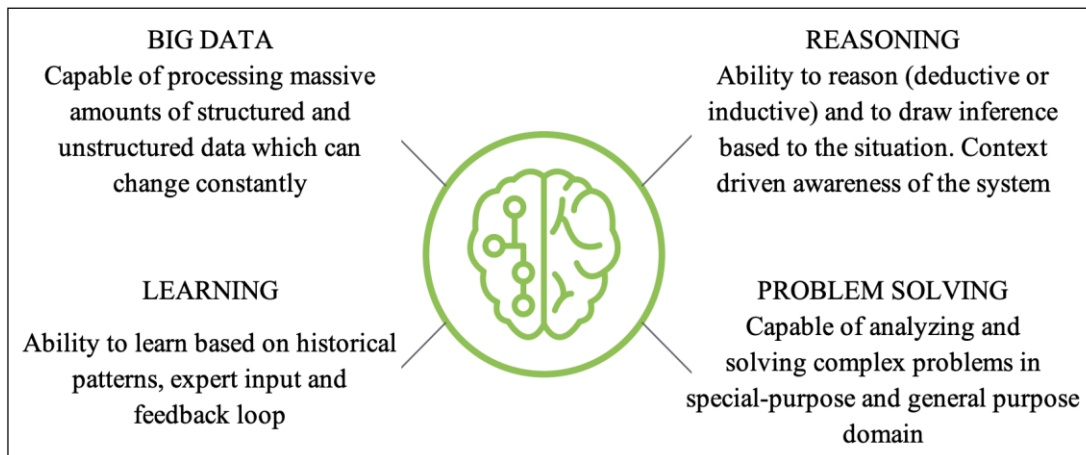
Amazon uses AI to make recommendations to customers. In 2011 Apple's first interactive assistant – Siri – is launched, and IBM Watson (a computer system capable of answering questions in common language, built on artificial intelligence) wins over Jeopardy champions Brad Rutter and Ken Jennings.

- 2012-present: The AI industry boom – progress is visible and unimaginable for the 1960s. In 2012 Google introduces the first autonomous machines. More and more companies are integrating artificial intelligence concepts into their businesses to increase performance and streamline work processes.

### **3.2 What is the AI technology**

As many industries have already integrated AI in one form or another, we can say that artificial intelligence will become the defining technology of the age. The use of AI can enable companies to grow, but also the global economy. According to Forbes, AI will become an extremely important pillar of foreign policy. The U.S. Secretary of Defense has publicly acknowledged the importance of government partnerships with companies developing innovative AI technologies to maintain and grow U.S. global competitiveness.

In the figure 3 we can see the basic characteristics of an AI system. The additional advantage is that data processing and response delivery is done in a short time, thus streamlining processes.



**Figure 3. Key characteristics of an AI system**

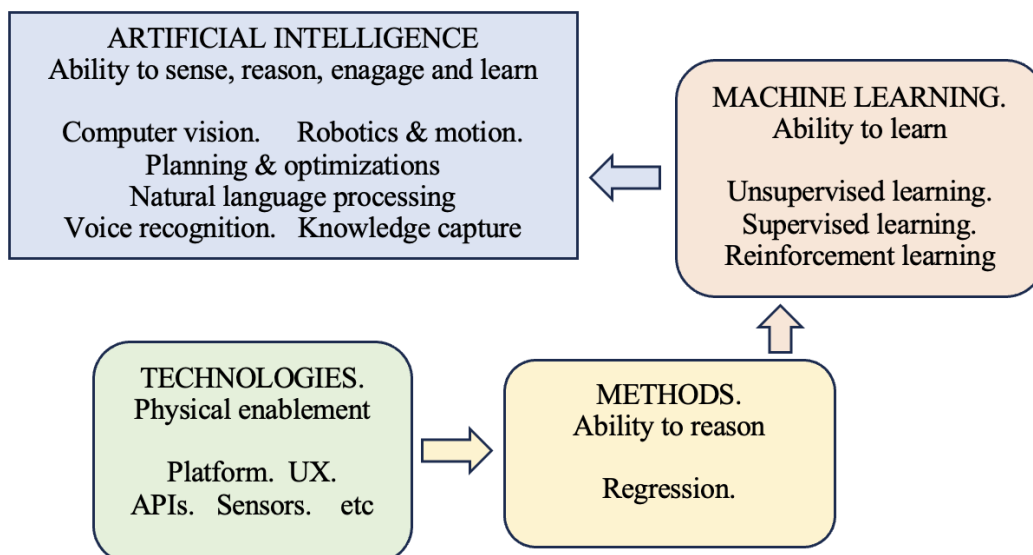
Source: Author adaption according to Deloitte (2023)

Closely related to the notion of artificial intelligence is that of machine learning, as well as the methods and infrastructure needed to make it work.

An AI system combines and uses multiple machine learning and data sets to obtain artificial intelligence attributes.

Machine learning is a process by which a computer, exposed to training data on a frequent basis will `learn` to identify certain patterns and patterns of action. This machine learning action can be applied to many types of problems and data sets (Deloitte, 2018). At the heart of the whole process are the different types of IT technologies.

Once suitable methods have been identified, the machine learning system will be trained to determine behaviours and responses. As a result of these steps, the end is represented in the structured form in the figure 4.



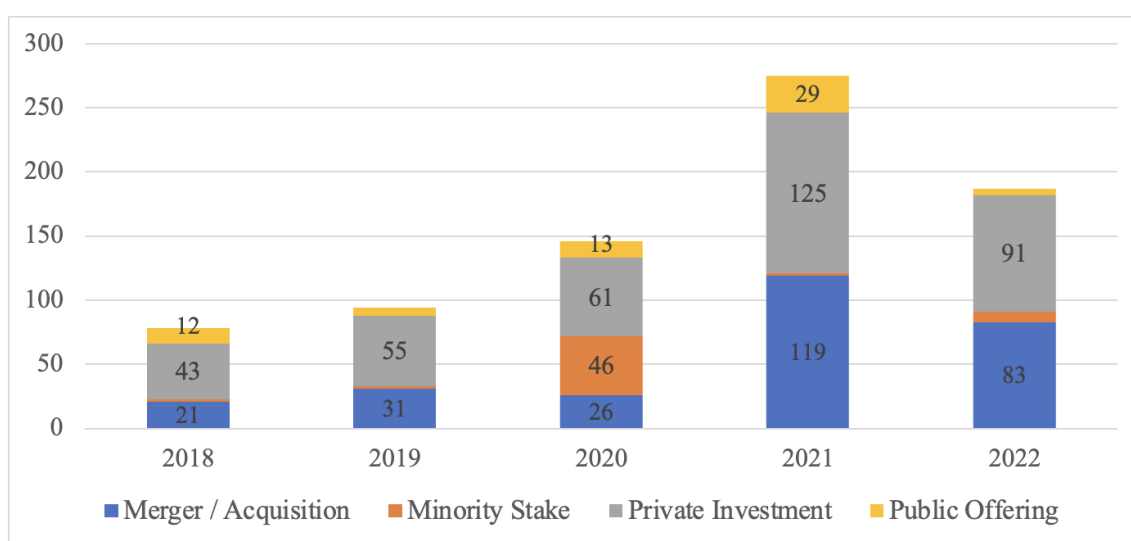
**Figure 4. Relation between AI and the rest of the elements**

Source: Author adaption using data from Deloitte (2022)

### 3.3 The AI impact across the globe

The technologies developed with AI are of great significance and importance both for the development of companies and for the national and global economy. In order to highlight a few key issues, in this sub-chapter, we will only focus on the period 2021-present, as these are the years in which the notions of AI have been most highlighted, used and developed.

Figure 5 shows that investments in AI have increased (in 2021 private investments have more than doubled in 2020), directly proportional to their concentration. However, the number of AI companies is decreasing, from 1051 in 2019 to 746 in 2021. At the same time, global AI legislation has also been developed - an analysis of the AI Index in 25 countries shows that the number of bills containing this notion has increased from 1 in 2016 to 18 in 2021.



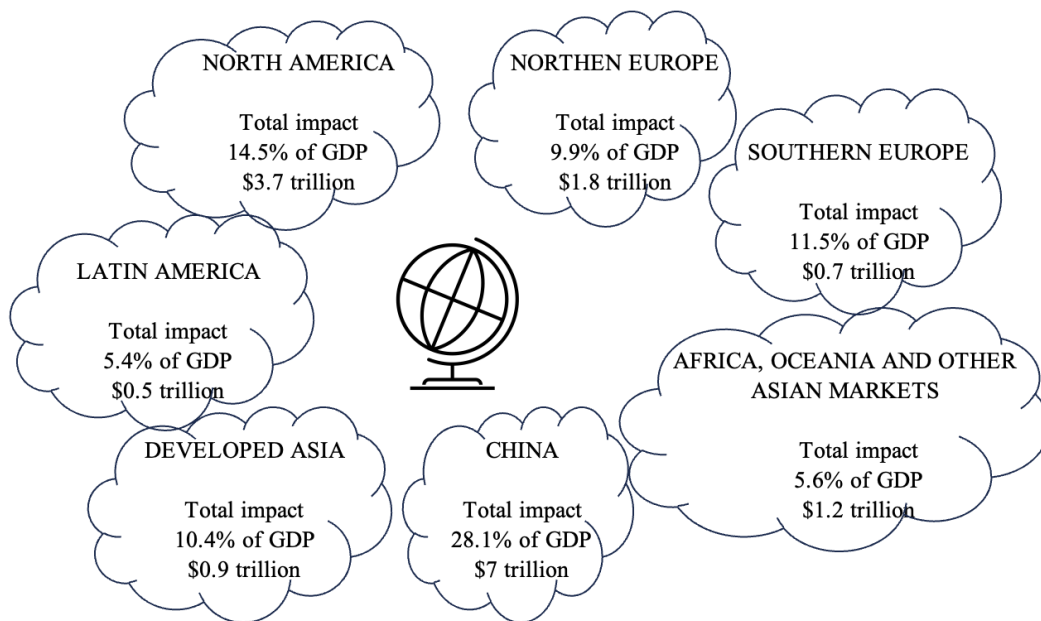
**Figure 5. Global corporate investments in AI by investment activity (\*rounded to billions U.S. dollars)**

*Source:* Author adaption using data from AI Index Report, Stanford University Human-Centred Artificial Intelligence (2023)

Directly proportional to AI research and advancement is the increase in ethics-related publications. Researchers with affiliations in the field contributed 71% more publications to ethics-focused conferences in 2021. (Stanford University Human-Centred Artificial Intelligence, 2022)

By geography, the largest amount of private investment in AI in 2022 was in the United States (\$47.36 billion), followed by China with \$13.41 billion. Among the European countries, we mention Germany (in the middle of the ranking of the 15 countries with a value of 2.35 billion euros), France - 1.77 billion euros, and the last place is Finland with 0.61 billion euros invested.

The advancement of AI technologies has not been uniform across industries, nor across countries. In Figure 6 we can see which regions will have the most to gain from the use of AI, according to a study by PriceWaterHouseCoopers (PwC).



**Figure 6. Regions that will win the most from AI**

*Source:* Author adaption using data from PriceWaterHouseCoopers (2023)

China and North America top the list at 26.1% and 14.5% of total gross domestic product respectively, accounting for \$10.7 trillion and 70% of the global economic impact. It is expected that in China the development of technologies will be slower and the impact on GDP levels will be felt by 2030, but for America the impact will be felt earlier. Although geopolitical tensions between the United States and China are rising, they had the highest number of collaborations on AI-related publications in the period 2020-2021. These collaborations produced 2.7 more publications than the UK and China (Stanford University Human-Centred Artificial Intelligence, 2022).

Developed countries in Europe will also feel the impact of the use of AI technologies; unfortunately, the same will not be true for less developed countries, which will have a much lower adoption rate. From the same study, we learn that the healthcare and automotive sectors have the highest degree of impact that AI will have on them economically.

Among the most widely used methods of implementing AI technology we mention:

- Voice-to-text or speech recognition – this uses natural language processing (NLP) techniques to process speech in text format (e.g. Siri);
- Customer service or virtual assistants – these have the ability to answer frequently asked questions, suggest ideas to customers, cross-sell, etc. We find this type of service within e-commerce sites, various messaging applications, etc.;
- Computer vision – this capability allows AI systems to obtain information from digital images, visual inputs or videos and react based on them. This system is powered by convolutional neural networks and is used in photo tagging in social networks, in the automotive industry for self-driving cars and in medical imaging;
- Recommendation engines – with the help of AI algorithms, behaviors and trends are analysed with the help of data storage and then used to make relevant recommendations to customers;
- Automated stock trading process – aimed at optimizing stock portfolios; trading platforms using AI can execute thousands or even millions of trades daily without human intervention (IBM, n.d.)

An analysis of the year 2020 compared to 2021, which is made in terms of the areas of activity in which private investments in AI have been made, was as well developed by Stanford University. The largest investment market was data management, processing and cloud, with a total value of approximately \$12.2 billion, followed by investments in healthcare and assistance (approximately \$11.29 billion) and fintech (\$10.26 billion).

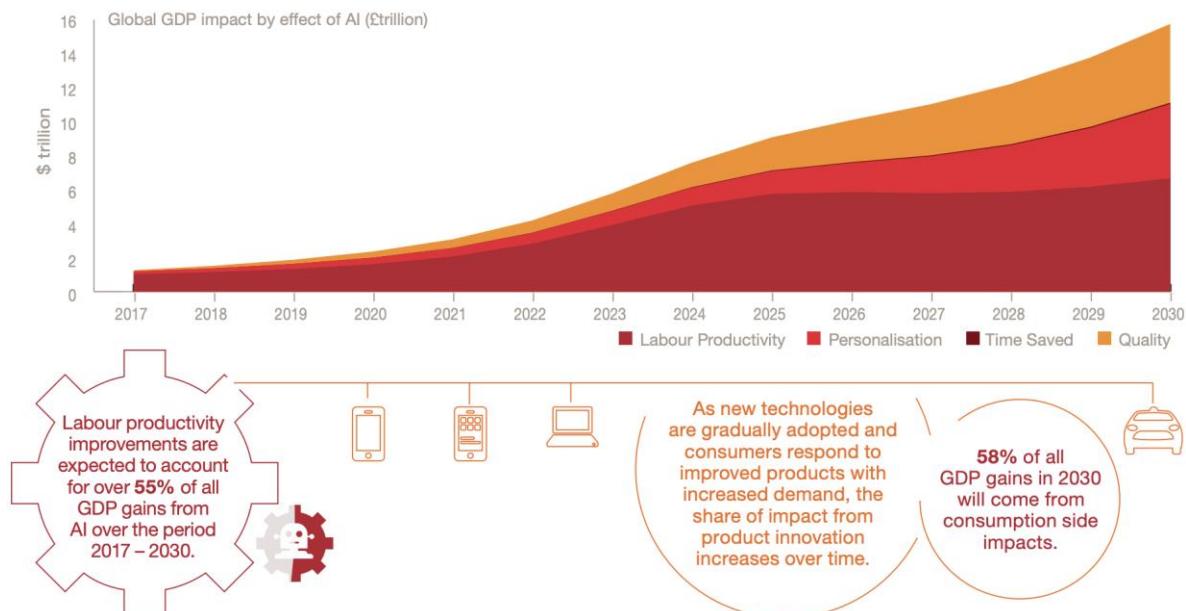
The investment market involving AI technology is an emerging one and this will certainly be seen in the coming years. Looking in the short term, the biggest economic growth expected as a result of AI technology comes from productivity growth. This includes automating daily tasks, increasing employee efficiency and redirecting their work to higher value-added activities. As mentioned in a previous sub-chapter, competitive impact can generate competitive advantage and automatically confer market advantage. Entrepreneurs can therefore aim to improve their market share with the help of emerging technologies.

### 3.4 Disadvantages of AI technology

As we have presented in the previous sub-chapters, we have no doubt that AI technologies will help to develop the performance and efficiency of both small firms, large companies and the national and global economy. However, there are also disadvantages of using AI technology.

According to a study, this industry could consume as much energy as a country the size of the Netherlands by 2027. With the mass deployment of technologies, since the advent of ChatGPT, energy consumption has increased considerably. The environmental impact could still be mitigated if the pace of technology development slows down (BBC, 2023).

Although we do not have the necessary data from the companies on resource consumption, the estimate was made based on clear calculations of firm computer orders and the energy they are expected to consume.



**Figure 8. Where will the value gain from AI**

Source: PriceWaterHouseCoopers (n.d.)

To balance these types of situations, we also present a case at the opposite pole: Google together with American Airlines have discovered that they could halve the amount of vapour created by aircraft by using an experimental AI tool that will automatically select the altitude.

Also, among the less favorable aspects of using AI we can mention: high implementation cost compared to return of investment; lack of creativity and empathy in selecting certain decisions; search engine optimization (SEO) quality is not performed at adequate standards and last but not least, the ethics aspect (Marketing Insider Group, 2023).

Among the ethical challenges we have to work with are: due to the lack of transparency of AI tools, decisions are not always understandable to humans; lack of non-neutrality - decisions made with AI are susceptible to inaccuracies, discriminatory or biased outcomes; it is also important to establish a practice of data collection oversight and user privacy, while taking care of fairness and risk with regard to human rights and fundamental societal values (UNESCO, 2023).

### **3.5 The future of AI technology**

The future of artificial intelligence will shape a shift from traditionally human-driven operations to an era of work performed by automated computers. According to a study by the US Bureau of Labor Statistics (BLS), they forecast a 19% growth in the computer and information research field from 2016 to 2026; however, this growth will outpace the growth in job vacancies as the need for specialists in the field increases. By 2018, Microsoft has filed nearly 700 patents for AI technology, demonstrating that they have foreseen how the market will evolve (Maryville University, 2019).

An indirect effect that will occur with the implementation and further development of this technology is self-evident: the pace of life will accelerate, as all processes will be carried out much faster, including state institutions will have to implement such measures to respond more quickly to the demands of citizens.

One of the areas that will be improved with AI is personalised medicine. With the help of AI technology, it will be possible to synthesise and predict personalised treatment regimens for each patient in a short time, without the need for clinical trials (Forbes, 2022).

Aviation could also be improved with AI. At this point, at the heart of maintenance solutions these technologies have already been implemented. In this way, maintenance technicians receive unprecedented levels of information about aircraft performance and condition. Airline operators have seen a 35% reduction in disruptions thanks to artificial intelligence and intelligence. This perspective is not the only one that can be improved with AI in airlines, also reducing downtime by improving ground process management can have a significant impact on transport performance (Honeywell, n.d.)

Global spending on AI reached nearly \$118 billion in 2022 and is expected to exceed \$300 billion by 2026. The traditional AI system is one driven by rules and logic and makes decisions based on previously determined outcomes. When we talk about generative AI, we take the discussion one step further - it adapts information based on what it has seen before, but decisions are made on its own. This type of AI has a strong impact on operational excellence, by: increasing productivity, accelerating time to value (reducing the time it takes to see the benefits of an investment) and accelerating the adoption of AI technology (when users see that they can trust the decisions made by AI and that they can increase the efficiency of their processes, they are more likely to want to take full advantage of the technology (Inc, n.d.). In the future, it is also expected that notions of privacy will be severely challenged, as systems using AI will likely become more knowledgeable than we can imagine about each other. Also, still about information and how to structure and use it, in the future we will see increasingly clear legislation in the field of AI systems. Also in the legal field, we can expect that in the future the number of small and medium-sized firms providing certain types of services will be significantly reduced as these types of services will be carried out with the help of AI systems and chatbots.

There are several industries where we may see significant future adoption and implementation of AI technologies. We start with education, as it is at the core of everything; trainings and courses will be able to be optimized and adapted to specific needs, as well as educational strategies will be determined based on the learning styles of students.

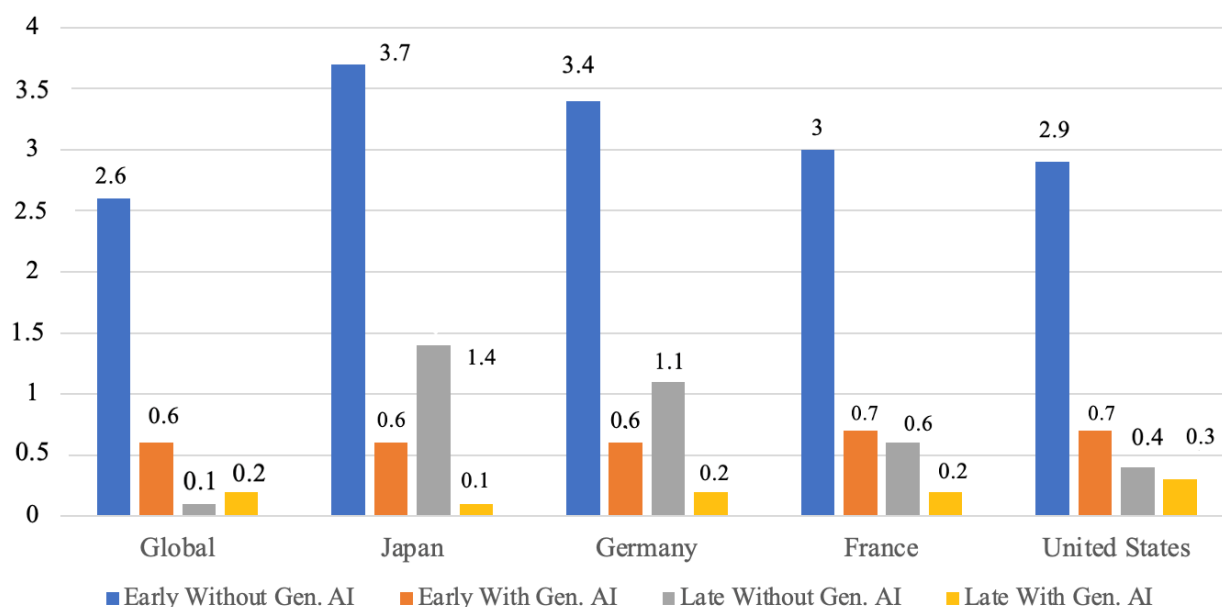
Another important area is healthcare. In the future we should expect diagnostic processes to run more efficiently and accurately. However, here we must consider an element mentioned above, namely that relating to the protection of patients' data, which will lead to a much more complete medical-legal framework that will possibly involve higher costs.

The financial area will also be impacted; it is expected that in the future sophisticated chatbots will be developed that can monitor information such as credit score, financial planning, tracking fraud attempts, etc.

Transport, as we have already seen, will be impacted. The number of autonomous cars, both personal and road transport, is expected to increase significantly (TechTarget – AI Enterprise, 2023)

The fear we can see among people about the evolution of these systems comes from several sources, the most important of which is the fear of job loss. Therefore, it is vital that in the future the use of AI is carried out in the human 'team'. Using the advantages offered by AI technology is necessary, but it can be used to streamline work processes and optimize employees' working time, in order for them to carry out activities that involve brainstorming, creativity and added value. Therefore, retaining people even in areas potentially influenced by AI is one of the keys to the adoption of these technologies by citizens.

According to a study by McKinsey Digital, they reported that AI could help to significantly increase productivity, as employees' working hours could be redistributed more efficiently in the context of maintaining their productivity levels. Encouraging employees to learn new skills or even to reorient their careers could also help to foster sustainable development and inclusion.



**Figure 9. Productivity impact by AI automation, 2022-2040**

Source: Author adaption using data from McKinsey & Company report (2023)

The horizon in which artificial intelligence will make its effect is a long one and certainly the fields of activity are complex and diversified. No doubt terms such as artificial intelligence and machine learning will be in common use in the years to come. But it is important to learn how to manage these developments so that the advantages do not become major disadvantages.

#### **4. ACHIEVING BUSINESS EXCELLENCE THROUGH AI TECHNOLOGY**

In the previous chapters of the paper, we started from the analysis of the concept of artificial intelligence and its related elements, its emergence and milestones over the last decades, we presented (briefly) what are the advantages and disadvantages of these technologies but also how their future is expected in the coming years.

In this chapter we look at how the biggest companies have used these technologies and managed to achieve business excellence and what the future trends should be for other companies.

Excellence in business is in concept applicable regardless of the field of activity. We will now present some of the industries where AI systems have helped not only to increase efficiency and productivity, but also to achieve a certain standard in business.

One of the most important branches of the economy is agriculture (not for all countries, but it is vital for all). AI systems have been used in three ways: crop and soil monitoring, robotics and predictive analytics. John Deere (the world's largest manufacturer of agricultural machinery) has invested in technology and robotics over the past decades to launch the first fully automated tractors. With proper training, they can perform tasks such as cultivation, harvesting and fertilization with minimal human intervention. Predictive analysis is also extremely important. Combining real-time sensor data with drone analysis, AI systems are able to provide farmers with guidance to improve crop yields. PepsiCo (US) has partnered with India's Cropin to launch a model that uses predictive AI analytics to improve potato yields.

Logistics and retail are other sectors where AI has brought improvements. Another example from America, this time we refer to Amazon which patented in 2014 a technology for predictive logistics. They analyze customer data to forecast demand for goods so that shipment can be made within hours of placing an order. Also, in this category are chatbots that answer customers' questions and even help them place orders; however, monetizing this service is not necessarily the easiest. Walmart closed the virtual assistant after 3 years, in 2020, because it was underused. Another interesting situation is found in China where digital avatars of influencers are used among luxury brands such as Prada or Louis Vuitton.

I have also mentioned in previous sub-chapters the impact that artificial intelligence has and will have in the automotive sector. This time, we will also present concrete examples: AI systems combined with LiDAR sensors can steer self-driving vehicles. Automated driving involves 5 levels, and GM's Cadillac Escalade, BMW's X5 and Tesla's S models operate at levels 2 or 3, which means they still require constant human assistance, but perform braking, acceleration and adaptive control actions. Also in the automotive sector, there are improvements in production with AI, which is used, for example, in performing automatic inspections and detecting defective products. This system is used by BMW, Toyota and GM.

As we mentioned earlier about agriculture, another important branch is energy. Since different types of power plants (solar, wind, etc.) operate according to weather conditions, they need to be managed more appropriately to avoid interruptions. The US has already implemented AI at the heart of the Department of Energy's smart grid strategy, while on the European continent the UK's National Grid is developing cloud-based analytics with IBM. With these improvements, fluctuations can be monitored in real time to better manage increases in energy demand. These changes will also be reflected in the case of electrically powered cars.

Excellence cannot be absent from the healthcare sector either. As mentioned earlier in the paper, there are situations where AI systems can significantly improve this industry. In order to accelerate research and development efforts and beyond, big names such as Pfizer, Sanofi and Genetech are using AI systems to streamline processes and accelerate advances in medicine. Within the healthcare system, other companies are using predictive AI systems to assist physicians in decision making, research collaborations and managing patient flow within hospitals, including Johns Hopkins Hospital (US) and Bradford Royal Infirmary (UK), hospitals where the American medical technology company GE HealthCare has implemented such systems. Also, for the future, diagnostics is another field with much potential in exploiting these advances offered by artificial intelligence.

Next, we mention a few companies that use AI systems to develop and gain competitive advantage in the market; also, surely most people know about these giants, therefore we can say that they have reached the level of excellence in business. We believe that they will not stop there for sure.

Google – although not so well known, this company has been using AI systems for text translation and speech recognition for years. Today, they have an entire division focused on artificial intelligence; they develop products: Bard (similar to ChatGPT), the PaML API system that works with large-scale language models, but they have also developed a coding wizard that helps Android app developers.

IBM has been a reputable company for decades. Known for their hardware and software products, they have also developed an AI platform `watsonx` which includes as core components AI, machine learning, AI systems for workflow acceleration. Not insignificantly, they are collaborating with NASA to produce the first open-source AI geospatial foundation model that will have a positive impact on climate and earth science research.

AIBrain is pursuing the growth of human intelligence with AI. They develop products that are geared towards improving human intelligence in cognitive, physical, emotional and social dimensions. They developed AICoRE (Adaptive Interactive Cognitive Reasoning Engine), which mimics and automates human reasoning, and Memory Graph, an AI memory system. They have also created products to promote learning for children - SMILE, Tyche and Futurable.

Innovation and excellence with AI are not only possible for large companies. There are also small companies with a strong innovative character; the major difference comes from the budgets that can be allocated to research.

More than 40 companies participated in the Spotlight 2023 competition, which aimed to obtain the 880.000 euros funding (the final took place on the stages of the `How to Web` conference in Bucharest). The funders of this award were: Credo Ventures, SMOK Ventures, Fiedler Capital, Startup Wise Guys, Underline Ventures, Fortech Investments, Seedblink as well as private investors. The participants were teams from several countries around the globe, and almost all, if not all, of the proposed projects had an AI component in the development, precisely to turn a trivial idea into innovation and progress into excellence. The areas were diverse ranging from streamlining workflows, to innovative human resource planning, to integrations and analytics with social marketing platforms and even medical apps for tracking medical progress and proposals for integration with hospitals.

Business excellence in any industry can be achieved, currently, by integrating AI systems into processes and workflows. It is true that as the size and monetizable value of a company increases, so does its ability to invest and therefore its R&D budget. However, even small companies now have the opportunity (and many of them the potential) to grow considerably in the market, if not through in-house R&D, with the help of AI-based products made by large companies in the market.

## 5. CONCLUSIONS

The period we are in is strongly marked by the rise of digitization, new ways of managing large amounts of data, the uncertainties offered by new developments and integrations - all of which will make the difference between stagnation and prosperity, between failure and success, between survival and excellence.

Some say the future is bleak, with all these AI systems that at some point will take over the market and become more usable than the human workforce. Others claim that progress, now that we understand the value and power they bring, will not be possible without them. We cannot know with certainty what society/economy will look like in 15-20-100 years. What we do know, however, is that AI systems and their related elements have completely changed the perception of everything we knew existed before.

As we have presented in the paper, artificial intelligence and machine learning can be used in almost any field of activity. It is important to understand what the problem is in order to determine what the solution is. AI systems can exponentially help increase productivity and efficiency within companies, but they can also give employees less time to perform repetitive tasks, and the time saved can be used in more creative and value-adding directions. In the future, it is envisaged that the idea of 'cobots', i.e. human-robot teams, collaborative teams that can increase the value of work, will spread.

It is expected that by 2027, the market for coasters will be worth \$7.5 billion. The market is also expected to grow at an annual rate of 60% over the next 2 years and by more than 35% by 2027.

The impact of generative artificial intelligence on productivity could add trillions of dollars to the global economy. Following McKinsey's analysis, they estimated (across 63 case studies) that generative AI could add between \$2.6 - \$4.4 trillion annually. This can increase the overall impact of IA from 15 to 40%. The estimate will be doubled in value by calculating the impact of incorporating generative AI into software that is now used to perform other tasks than those analyzed in the study.

In conclusion, generative artificial intelligence is the key to accelerated, efficient and more productive economic development. But it is important to bear in mind the negative effects this can have, as mentioned in a previous sub-chapter; development, of whatever kind, of a state/global economy must be carried out in ways that are sustainable and sustainable for the planet and for generations to come.

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