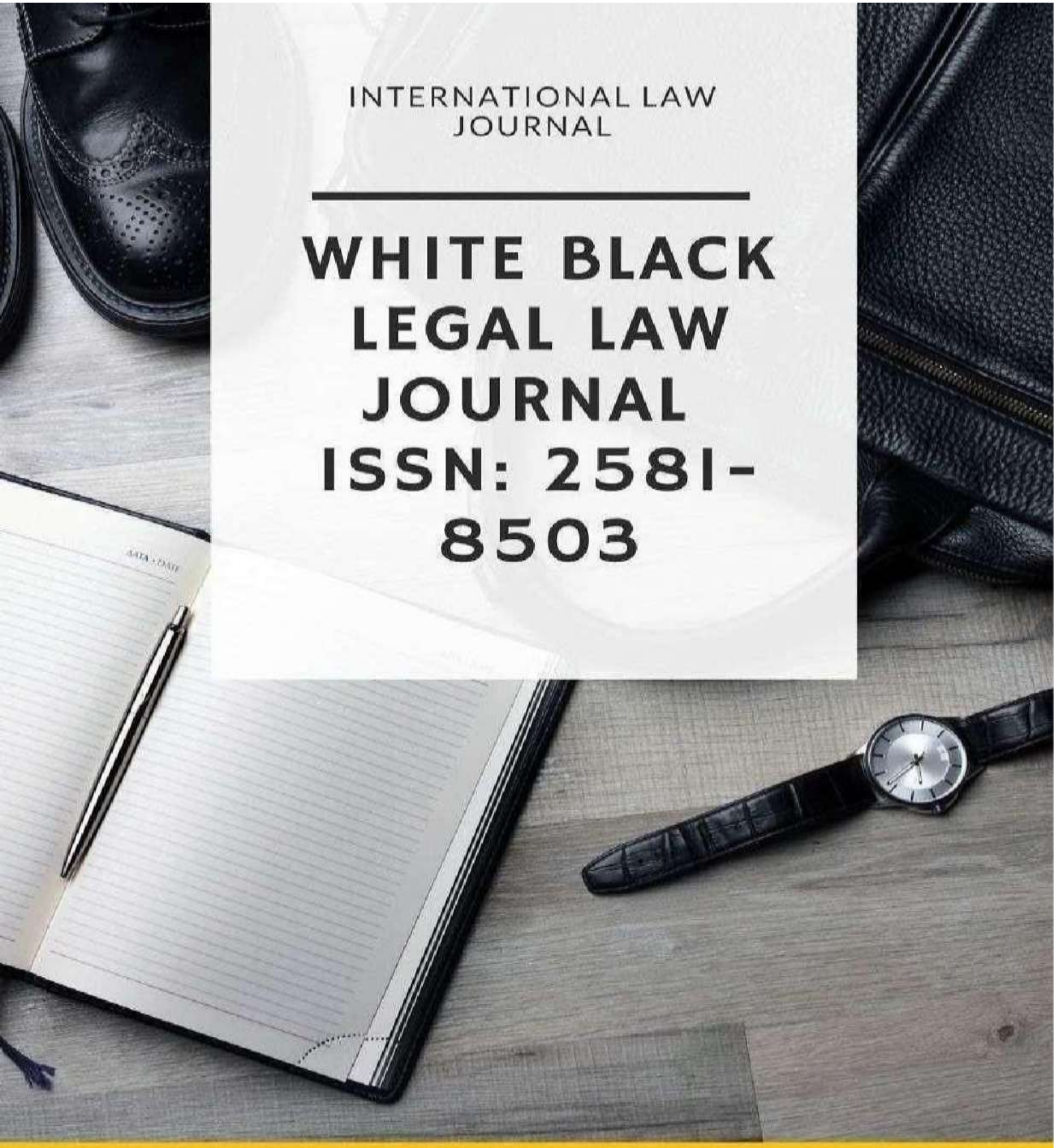

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# A COMPARATIVE ANALYSIS OF WHITE COLLAR CRIMES AND BLUE COLLAR CRIMES WITH SPECIAL REFERANCE TO INDIA AND THE INTEGRATION OF AI

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III YEAR-LL.B., 'E' SECTION – VI - SEMESTER
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# CERTIFICATE

This is certify that the research work *entitled* **A COMPARATIVE ANALYSIS OF WHITE COLLAR CRIMES AND BLUE COLLAR CRIMES WITH SPECIAL REFERANCE TO INDIA AND THE INTEGRATION OF AI**

Submitted by **Mr.KONGESWARAN M** ,**Register No. 23122811**, Department of Law, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Chennai, during the academic year 2025-2026, under the supervision of **Mrs. GODHAWARI P, Assistant Professor, School of Law, VISTAS, Pallavaram**. is an original piece of work.

To the best of our knowledge, this research has not been submitted in part or full for the award of any degree, diploma, associateship, fellowship, or title at this university or any other institution of higher learning.

Date:__ Place: Pallavaram

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## ***DECLARATION***

**Mr. KONGESWARAN M,** hereby declare that the Dissertation Titled **A COMPARATIVE ANALYSIS OF WHITE COLLAR CRIMES AND BLUE COLLAR CRIMES WITH SPECIAL REFERANCE TO INDIA AND THE INTEGRATION OF AI** submitted in partial fulfilment of the required credits for the award of the **Degree of Bachelor of Law (LL.B.)** at **Vels Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram**, is my original work.

This Dissertation has been conducted under the guidance and supervision of **Mrs. GODHAWARI P, Assistant Professor, School of Law, VISTAS, Pallavaram.** All sources of information, references, and literature used in this project have been duly acknowledged.

I further declare that this work has not been submitted elsewhere for any other degree or diploma.

Place: Pallavaram Date: ____

Signature: **KONGESWARAN M Reg. No.23122811**
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## ABSTRACT

Artificial Intelligence (AI) is changing the way we interact with technology and the way we live our lives. It has the potential to revolutionize the field of global technology, especially innovative use of technology. This research paper aims to investigate the role of AI in development, including its potential benefits, drawbacks, and challenges.

It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but Artificial Intelligence does not have to confine itself to methods that are biologically observable. While no consensual definition of Artificial Intelligence (AI) exists, AI is broadly characterized as the study of computations that allow for perception, reason and action. Today, the amount of data that is generated, by both humans and machines, far outpaces humans' ability to absorb, interpret, and make complex decisions based on that data. Artificial intelligence forms the basis for all computer learning and is the future of all complex decision making.

This paper examines features of artificial Intelligence, introduction, definitions of Artificial Intelligence, history, applications, growth and achievements. The paper further explores how Artificial Intelligence can improve the quality of human lives, enhance employability skills, and facilitate personalized learning.

The research also highlights the ethical, social, and cultural implications of Artificial Intelligence learnings in an International Perspective. The paper concludes that Artificial Intelligence has the potential to transform of technological advancement, but it requires careful implementation and ethical considerations.

**Keywords:** *Artificial Intelligence, International Perspective, Development, Technology.*

# CHAPTER - I

## 1. *INTRODUCTION*

The term Artificial Intelligence was first coined and used by John McCarthy in the year 1956 during a two-month long workshop held at Dartmouth College, US. (Zawacki-Richter et al., 2019) But even before this, evidences suggests that artificial intelligence had been talked about. M.A. Turing in his paper Computing Machinery & Intelligence (1950) wrote, "We may hope that machines will eventually compete with men in all purely intellectual fields". His predictions seem correct as we come across ChatGPT in the year 2022.

Artificial Intelligence is also called as the machine intelligence. A machine (computer system) mimics the human intelligence. Knowingly or unknowingly artificial intelligence has become an integral part of our lives. (Arya & Yadav, 2021) It is widely being used during online shopping, browsing internet, travelling using GPS.

Artificial Intelligence can be defined as machines that can perform the tasks that humans carry out through their thinking. (Dörfler, 2022) The usage of Artificial intelligence is growing at an unprecedented rate & it is rapidly changing the aspects of human life. (Xue & Wang, 2022a) In recent years the use of Artificial Intelligence (AI) & Learning Analytics (LA) have effectively been introduced in the field of technological development.

Artificial Intelligence (AI) is the branch of computer science which deals with intelligence of machines where an intelligent agent is a system that takes actions which maximize its chances of success. It is the study of ideas which enable computers to do the things that make people seem intelligent. The central principles of Artificial Intelligence include such as reasoning, knowledge, planning, learning, communication, perception and the ability to move and manipulate objects. It is the science and engineering of making intelligent machines, especially intelligent computer programs.

### 1.1. *BACKGROUND OF THE STUDY*

The increasing importance of Artificial Intelligence for systems used in our everyday lives has, unsurprisingly, produced an abundance of literature in various fields regarding possible definitions and notions as well as related concepts, techniques and technologies. However, from a lawyer's perspective, most of them are not a suitable starting point for making reliable assessments about these new technologies. The same is true for other legal deliberations on systems, be it on their robustness against cybersecurity threats, the possibility to protect them under intellectual property laws, their autonomy when assessing 'their' harmful actions, etc. Hence this research would be a composite study on the Artificial Intelligence and its advancement in an international perspective.

### 1.2. *AIM OF THE STUDY*

Artificial Intelligence and machine learning play a crucial role in various fields of application. In one way or another, they influence our everyday lives. This current state of affairs and the suggestive power of these terms have triggered fundamental discussions in society. However, the technical basics have not received the attention they deserve – and need. This is especially true from a legal perspective, where groundwork on both the fundamental functionality as well as all the relevant terms surrounding the technology seems to be almost non-existent. This paper aims to fill this gap. We examine the technical background of artificial intelligence and machine learning from an interdisciplinary perspective and aim to develop common definitions that can be used for further research in an International Perspective.

### 1.3. *OBJECTIVES OF THE STUDY*

The research objectives of the study are as follows:

- To inspect the spread of Artificial Intelligence (AI) on technological field.
- To examine the incorporation of Artificial Intelligence for improving the learning quality and practices in an International Perspective.
- To analyse the advantages and disadvantages for the integration of Artificial Intelligence in technological advancement.

## 1.4. *SCOPE AND LIMITATIONS OF THE STUDY*

*Scope of the Study*

Information Technology can be read with respect to different aspects such as – data exclusivity, privacy, trade secrets etc. But, under this research, I have limited the scope of my research to only Artificial Intelligence with respect to a simple component of the technology. Owing to the restraint of time and word limit, other aspects of Artificial Intelligence have not been covered in this research. Further, for proposing a solution to the conundrum of informational learnings of individuals over Artificial Intelligence in the cyberspace transformation, I have limited the scope of research to only to understand the foundation of specialized hardware and software for writing and training machine learning algorithms.

*Limitations of the Study*

This research paper is a limited study in this area owing to the word limit and limitation of time prescribed by the institution. A more extensive study, both doctrinal and empirical, can be done by studying the present area from a more technical point of view, to highlight other major problems associated with Artificial intelligence and machine learning, if time and word limit permit. If the time constraints were removed, many other case studies could be included for the same research.

## 1.5. *REVIEW OF LITERATURES*

1. Stuart J.Russel and Peter Norvig 'Artificial Intelligence, A Modern Approach' a book published by Pearson Education Inc., 2010.
2. Van Roy, V., et al. (2021) AI Watch – 'National strategies on Artificial Intelligence: A European perspective', 2021 edition. European Commission. Publications Office of the European Union, Luxembourg.
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4. Haenlein, M. and A. Kaplan (2019) 'A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence'.

California Management Review 61(4): 5-14.

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8. Ade-Ibijola, A., & Okonkwo, C. (2023). 'Artificial Intelligence in Africa: Emerging Challenges. In Responsible AI in Africa: Challenges and Opportunities' (pp. 101-117). Cham: Springer International Publishing.
9. Ha, M.S., & Nguyen, T.L. (2022). 'Digital Transformation in Banking: A Case from Vietnam. In Smart Cities in Asia: Regulations, Problems, and Development' (pp. 103-114). Singapore: Springer Nature Singapore.
10. Patil, S., & Shankar, H. (2023). 'Transforming healthcare: harnessing the power of AI in the modern era'. International Journal of Multidisciplinary Sciences and Arts, 2(1), 60-70.

### 1.6. *RESEARCH PROBLEMS*

Technological advancement tools like Artificial Intelligence have the potential of causing hindrance in the way of right of every person's learning process to have a free and fair knowledge and, therefore, needs to be used with certain precaution and regulatory measures towards proper use of Artificial Intelligence tool in an International Perspective.

### 1.7. *RESEARCH QUESTIONS*

The research questions for the study are as follows:

RQ1: In what manner has Artificial Intelligence proliferated in the field of technological development?

RQ2: How has the incorporation of Artificial Intelligence improved the learning quality and practices?

RQ3: What are the various advantages and disadvantages for the integration of Artificial Intelligence in Technological learnings?

### 1.8. *HYPOTHESIS*

i. The result of humans' advanced intelligence will be artificial intelligence.
ii. Individual characteristics will have effect on the learnings of Artificial Intelligence.
iii. Artificial Intelligence is a way forward to reduce the manpower to make task easy.

### 1.9. *RESEARCH METHODOLOGY*

In this paper, the researcher uses an analytical method of doctrinal research techniques in which the researcher collects data through books, journals, newspapers, online news, expert opinions and other research supporting readings, then describes all research materials and describes in detail the title researched and provide an overview of the continuity the research analysis on Artificial Intelligence and its utilizations in the international perspective of technological development.

### 1.10. *RESEARCH SCHEME – CHAPTERIZATION*

This work is divided into five Chapters. Chapter I, which is introductory in nature puts forward the problem. It gives a brief overview of the topic of research and its investigation methodology, scope, limitations and review of the literature. Chapter II deals with the background and historical development of Artificial Intelligence and its recent advancement, applications of Artificial Intelligence in three major sectors. Chapter III revolves around threats and opportunities of Artificial Intelligence in Global Developments and India. Chapter IV discusses about the potential use of Artificial Intelligence in various fields and the barriers faced by the developing countries. Chapter V which puts an end to the work with few concluding remarks.

## CHAPTER - II

***Historical Background of Artificial Intelligence***

### 1. ARTIFICIAL INTELLIGENCE BACKGROUND AND HISTORY

Artificial Intelligence can generally be thought of as computerized systems that work and react in ways commonly thought to require intelligence, such as the ability to learn, solve problems, and achieve goals under uncertain and varying conditions, with varying levels of autonomy. Artificial Intelligence is not one

thing; rather, Artificial Intelligence systems can encompass a range of methodologies and application areas, such as natural language processing, robotics, and facial recognition.

Common terms used in the field of Artificial Intelligence include machine learning (ML), deep learning (DL), and neural networks. ML, often referred to as a subfield of Artificial Intelligence, examines how to build computer programs that automatically improve their performance at some tasks, through experience, without relying on explicit rules-based programming to do so.[1] One of the goals of ML is to teach algorithms to successfully interpret data that have not previously been encountered. DL systems learn from large amounts of data to subsequently recognize and classify related, but previously unobserved, data. Neural networks, a type of DL often described as being loosely modeled after the human brain, consist of thousands or millions of processing nodes (i.e., computational units). DL approaches have been used in systems across many areas of Artificial Intelligence research, from autonomous vehicles to voice recognition technologies.[2]

Historically, there has been debate over which technologies should be classified as Artificial Intelligence. For example, robotic process automation (RPA) has been described as the use of rulesbased software to automate highly repetitive, routine tasks normally performed by knowledge workers.[3] Because it automates activities performed by humans, it is often described as an Artificial Intelligence technology. However, some argue that RPA is not Artificial Intelligence because it does not include a learning component. Others discuss RPA as a basic tool that can be combined with Artificial Intelligence to create complex process automation, or intelligent process automation, along an "intelligent automation continuum."[4]

[1] Adapted from Erik Brynjolfsson, Tom Mitchell, and Daniel Rock, "What Can Machines Learn, and What Does It Mean for Occupations and the Economy?" AEA Papers and Proceedings, vol. 108 (May 1, 2018), pp. 43-47, https://dspace.mit.edu/bitstream/handle/1721.1/120302/pandp.20181019.pdf.
[2] Larry Hardesty, "Explained: Neural Networks," Massachusetts Institute of Technology (MIT) News, April 14, 2017, http://news.mit.edu/2017/explained-neural-networks-deep-learning-0414.
[3] For more information, see IBM, "What Is Robotic Process Automation (RPA)?," https://www.ibm.com/topics/rpa.
[4] IBM Global Business Services, "Using Artificial Intelligence to Optimize the Value of Robotic Process Automation," September 2017, at https://www.ibm.com/downloads/cas/KDKAAK29.

The term artificial intelligence was coined at the Dartmouth Summer Research Project on Artificial Intelligence, a conference proposed in 1955 and held the following year. Since that time, the field of Artificial Intelligence has gone through what some have termed summers and winters—periods of much research and advancement followed by lulls in activity and progress. The reasons for the Artificial Intelligence winters have included a focus on theory over practical applications, research problems being more difficult than anticipated, and limitations of the technologies of the time. Much of the current progress and research in Artificial Intelligence, which began around 2010, has been attributed to the availability of large datasets (i.e., big data), improved ML approaches and algorithms, and more powerful computers.

## 2.2. *RECENT ARTIFICIAL INTELLIGENCE ADVANCES*

One of the most notable areas of advancement in Artificial Intelligence has been in GenAI models and applications, such as ChatGPT.[5] GenAI refers to ML models developed through training on large volumes of data in order to generate content. ChatGPT is an AI chatbot from a company called OpenAI, underpinned by a type of AI called a large language model (LLM). LLMs are trained on massive amounts of data, largely collected from public internet sites. When a user provides a prompt, usually a text prompt, the model can generate words or paragraphs with human-like quality. Other models can create different types of outputs from text prompts, such as images, music, videos, and computer code. GenAI models work to match the style and appearance of the underlying data, and they have shown what has been called "capability overhang," meaning hidden capabilities of Artificial Intelligence systems that researchers have not uncovered or thought to test for yet. While GenAI tools are not new, recent advances—particularly since the introduction of the transformer architecture in 2017 and improvements in "generative pre-trained transformer" (GPT) models since 2019—combined with the open availability to the public of these tools (2022) have led to widespread use.

Various measures may be used to assess the state of development and impacts of

[5] Generative Artificial Intelligence: Overview, Issues, and Questions for Congress, by Laurie A. Harris.

Artificial Intelligence technologies, such as research and development (R&D) activities, technical performance of Artificial Intelligence systems against established benchmarks, education and employment of Artificial Intelligence experts, adoption of Artificial Intelligence tools by public and private sector entities, and the development of Artificial Intelligence policies and governance models in the United States and other countries. The annual Artificial Intelligence Index report, led by a steering committee at Stanford University, is a prominent example of an attempt to quantify and collate such measures. The 2023 Artificial Intelligence Index report, released in April 2023, noted that "Artificial Intelligence continued to post state-of-the-art results, but year-over-year improvement on many benchmarks continues to be marginal" while also highlighting that "Artificial Intelligence models are starting to rapidly accelerate scientific progress," being used in 2022, for example, to aid hydrogen fusion work and generate new antibodies for use in medical therapies.

## 2.3. *BENEFITS AND POTENTIAL RISKS OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES*

Artificial Intelligence technologies and services hold the potential to both be beneficial in a number of sectors and pose a number of societal risks. Broadly, Artificial Intelligence technologies can accelerate and provide insights into data processing, augment human decision making, optimize performance for complex tasks and systems, and improve safety for people in dangerous occupations. In medicine, for example, Artificial Intelligence technologies that can rapidly and accurately predict protein structures, such as AlphaFold from DeepMind and ESMFold from Meta, can aid researchers in understanding how diseases work and creating new drugs to treat them.

Large-scale GenAI models are capable of an increasingly broad range of tasks, from text manipulation and analysis, to image generation, to unprecedentedly good speech recognition. These systems demonstrate capabilities in question answering and the generation of text, image, and code unimagined a decade ago, and they outperform the state of the art on many benchmarks, old and new.

However, Artificial Intelligence systems may perpetuate or amplify biases contained in the datasets that they are trained on, may not yet be fully able to explain their decision making, and often depend on vast datasets that are not widely accessible to facilitate R&D. Together, such challenges can lead to an inability to fully assess and understand the operations and outputs of Artificial Intelligence systems—sometimes referred to as the "black box" problem. Largescale models are prone to generating false content—sometimes called "hallucinating"—and are routinely biased, as they are largely trained on data scraped from the internet and therefore reflect the human biases expressed there. Stakeholders have questioned the adequacy of current laws and regulations for dealing with societal and ethical issues that may arise with the continued development and broad application of Artificial Intelligence. Further, stakeholders have raised concerns about potential job losses from Artificial Intelligence automation and questioned the adequacy of human capital in both the public and private sectors to develop and work with Artificial Intelligence.

## 2.4. *APPLICATIONS OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES*

Over the last two decades, Artificial Intelligence applications have witnessed unprecedented developments. Artificial Intelligence has improved robotics and automation, which has a significant impact on many aspects of a company, particularly in healthcare, education, and retail (marketing) services. Artificial Intelligence also has an impact on a wide range of social and industrial sectors, including rational design, medical care, educational service, and retail (marketing) services, as well as smart urban planning, transportation, and maintenance. In this paper, a critical review of Artificial Intelligence applications, future opportunities, and threats was presented. In addition, the paper also discusses how Artificial Intelligence -enabled technologies are being used in the healthcare, educational, and retail (marketing) sectors including their threats and opportunities.

### 2.4.1. *ARTIFICIAL INTELLIGENCE IN HEALTHCARE SERVICES*

The most effective use of medical artificial intelligence is to provide solutions that medical experts cannot achieve. Artificial Intelligence technologies are rapidly taking over the healthcare sector. Artificial Intelligence has aided the transformation of

the manual healthcare system into an automated one. The technical difficulties of digitizing healthcare present new issues when developers create Artificial Intelligence systems to perform tasks.

Furthermore, increase in population is expected to increase the demand for healthcare services. The healthcare sector requires creative solutions to become more effective and efficient without incurring excessive costs. The healthcare sector can benefit from quick technological breakthroughs, notably in the fields of Artificial Intelligence and robotics. Artificial Intelligence and robotics in healthcare are quickly developing, especially for applications in early detection and diagnostics. Artificial Intelligence has become more powerful by successfully completing in human tasks more quickly, easily, and economically. The use of Artificial Intelligence also comes with it various hazards and difficulties, such as the risk of patient harm from system flaws, patient privacy issues when acquiring data and others. Artificial Intelligence is essential for early detection and diagnosis, and it is applied in numerous ways to reliably, consistently, and swiftly detect diseases like cancer. Simply, it autonomously learns and detects associations and recommends a diagnosis.

Because Artificial Intelligence has demerits, the future of Intelligence in healthcare is not entirely optimistic. Numerous questions have arisen regarding whether Artificial Intelligence can exercise doctors' rights and obligations, as well as protect privacy concerns, and the applicable laws are not fully prepared for this advancement. Although it appears that present laws encourage Artificial Intelligence given its application in the global healthcare system. It has been established that guidelines for the creation, modification, and use of technology and health technology products to medical care are available. Online processes to acquire therapeutic knowledge have been established for many applications, such as a procedure or schedule of a medical procedure, symptomatic screening, and the diagnosis and prediction of certain disorders.

For example, the IBM Artificial Intelligence analyzes mammographic images and clinical records to predict a specific disease a year ahead of time with 87% accuracy, incorporating dysfunction, thyroid strength, biopsies, laboratory tests,

and codes from multiple findings was presented in. Also, for sugar IQ, a diabetic management software that employs an algorithm was developed to adjust blood glucose levels, insulin profiles, hypoglycemia scores, and dietary supplements to give clients the glucose experience they expect and anticipate was presented in. Artificial

### 2.4.2. *ARTIFICIAL INTELLIGENCE IN EDUCATIONAL SERVICES*

The emergence of innovative technologies in the educational sector has an impact on the methods of teaching and learning. With the rapid development of AI technology in recent years, its use in education has become important, especially during the COVID-19 pandemic.

4.2.1. Student needs can be adapted to educational software. One of the most important installations that can aid effective participation and learning in primary, secondary, and tertiary institutions is the use of advanced software to acquire tailored knowledge in one of the preceding styles with the use of apps, games, and software.

4.2.2. Artificial Intelligence can identify areas in which courses need to be improved Teachers most times may not be aware of gaps in communication while teaching their courses and in teaching materials given to students. Artificial Intelligence offers can be made to offer solutions to these difficulties.

4.2.3. Artificial Intelligence can help students with additional tutors. Educational tools, particularly those geared toward artificial intelligence, are now available to help college students with math, writing, and other subjects.

4.2.4. Students and instructors can benefit from Intelligence - driven programs Artificial Intelligence can give feedback on the overall effectiveness of the classes in addition to assisting teachers and students in developing lessons that are tailored to each individual's needs. Some universities, especially those that offer internet services, use Artificial Intelligence systems to monitor student progress and notify instructors/teachers when a problem arises with their students' performance.

4.2.5. Artificial Intelligence is changing the way we find and use information non-

intelligence agencies that have an impact on the records we view and receive daily are most times not discussed in literature. For instance, Google adjusts to customer requirements and orders, Amazon prepares recommendations based on prior purchases, Siri adapts to customer needs and orders, and nearly all online adverts are personalized to customer hobbies and purchasing interests.

4.2.6. The role of teachers could be changed by Artificial Intelligence Educators have a part in training students, although this job and what it entails can be altered by a new generation standing on the shoulders of smart computing Artificial programs. Artificial Intelligence, as we have pointed out, can take on tasks such as grading, it can assist college students in developing abilities, and can be used as another real worldwide teaching tool. The Artificial Intelligence programs can be created to deliver information, serve as a forum for college students to ask questions and learn facts, or provide a basic guideline for the teacher. Artificial Intelligence, on the other hand, may in extreme situations shift the instructor's role to that of a facilitator.

4.2.7. Artificial Intelligence can make trial-and-error learning easier Despite the fact that trial and error is an important part of learning, many students are afraid of failing or losing their grasp on a solution. As humans, most people don't want to learn from mistakes.

4.2.8. Artificial Intelligence -based data can change the way schools find teachers and support students Intelligent data collection aided by clever computer systems have altered the way schools connect with prospective students in the past and present. Artificial Intelligence has been useful from hiring teachers to assisting college students in selecting suitable guides to help achieve the students' desires and dreams.

### 2.4.3. *ARTIFICIAL INTELLIGENCE IN RETAIL (MARKETING) SERVICES*

A wide range of marketing researchers have recently become intrigued by Artificial Intelligence. Their research advances this developing field by taking a global perspective on Artificial Intelligence marketing tools. Three levels of analysis,

country, company, and consumer were the focus of their study. The country-level analysis highlights how different levels of economic inequality exist between nations due to the significant financial resources needed for Intelligence implementation. Globalization is the main emphasis of the company level evaluation. Because the hardware supporting these technologies is worldwide in scope, cultural adaptation is necessary for their implementation. The consumer-level analysis looks at consumer ethics and privacy concerns, as Artificial Intelligence technologies collect, store, and process a plethora of personal data from all over the world. The researchers focused on two important dimensions of Artificial Intelligence technologies in marketing through the prism of these three lenses: (1) human-machine interaction, and (2) automated analysis of text, audio, images, and video. They use a three-part global perspective to explore the relationship between these two important dimensions of Artificial Intelligence and provide a set of research questions for Artificial future marketing enthusiasts in this burgeoning sector.In marketing as well, rational ingenuity is employed.

Electronic shopping allows online businesses to collect massive amounts of data about purchases, bushels, and, events, design processes. This data offers merchants information on future expectations, advancements, and aid with store network operations, stock satisfaction, and delivery structures. For example, Walmart utilizes a ML picture algorithm named "Eden" in-group products for their brand which predicts when it would go bad. Home Depot uses critical thinking to foresee stock market possibilities and robotics in stock options, whereas the Kroger Company is attempting to develop a more limited approach to distribution center testing to fulfill client requests.

Some traditional merchants have begun to offer basic food products for delivery to competing internet retailers. Amazon Fresh, Instacart, Peapod, and Tesco, for example, provide essential products to their online customers. Developing a competent e-staple distribution system necessitates addressing many concerns, including issues of stochastic setting arrangements with user experience, a targeted vehicle that directs issues through time windows, and stock management issues. This problem structure is not limited to e-goods as it also applies to other end-to-end services such as home health care delivery, logistics, and institutional

management, as well as some home management services such as gas, energy, and water. Home management, while being the most expensive, polluting, and inefficient production network activity provides consumers with a wide range of focus areas, such as a wide selection of commodities, price comparisons between E-food feeds, and easy sales imports. A review of research on Artificial Intelligence technologies in marketing is vital, according to, with an emphasis on whether the studies take into account these two aspects of Artificial Intelligence (HMI and automated analysis), as well as the aspects of its global lens of inequality, globalization, ethics, and privacy.

## CHAPTER – III

Opportunities and Ethical Regulations of AI to combat the threats in an International

**Perspective**

## 2. THE THREATS AND OPPORTUNITIES OF ARTIFICIAL INTELLIGENCE

### 2.1. GLOBAL DEVELOPMENTS IN ARTIFICIAL INTELLIGENCE

Countries around the world are becoming increasingly aware of the potential economic and social benefits of developing and applying AI. For example, China and U.K. estimate that 26% and 10% of their GDPs respectively in 2030 will be sourced from Artificial Intelligence related activities and businesses. There has been tremendous activity concerning Artificial Intelligence policy positions and the development of an Artificial Intelligence ecosystem in different countries over the last 18 to 24 months – the US published its Artificial Intelligence report in December 2016; France published the Artificial Intelligence strategy in January 2017 followed by a detailed policy document in March 2018; Japan released a document in March 2017; China published the Artificial Intelligence strategy in July 2017; and U.K. released its industrial strategy in November 2017.

Infrastructural supply side interventions have been planned by various countries for creating a larger ecosystem of Artificial Intelligence development. Creation of "data trusts", rolling out of digital connectivity infrastructure such as 5G / full fiber networks, common supercomputing facilities, fiscal incentives and creation of

open-source software libraries are some of the focus areas of various governments as committed in their strategy papers.

In the area of core research in Artificial Intelligence and related technologies, universities and research institutions from the US, China and Japan have led the publication volume on Artificial Intelligence research topics between 2010 and 2016. Universities in USA, primarily Carnegie Mellon University, Massachusetts Institute of Technology and Stanford, took an early lead in Artificial Intelligence research by offering new courses, establishing research facilities and instituting industry partnerships. Off late, Chinese universities, especially Peking and Tsinghua Universities have caught on to the race by utilizing large scale public funding and extensive research partnerships with private companies.

For building the future workforce for Artificial Intelligence, countries are also significantly increasing the allocation of resources for Science, Technology, Engineering and Maths (STEM) talent development through investment in universities, mandating new courses (e.g., Artificial Intelligence and law), and offering schemes to retrain people. For instance, U.K. has planned to build over 1,000 government supported PhD researchers by 2025 and set up a Turing fellowship to support an initial cohort of Artificial Intelligence fellows while China has launched a five-year university program to train at least 500 teachers and 5,000 students working on Artificial Intelligence technologies.

Governance structures for enabling all the above mandates vary across countries. Many countries have instituted dedicated public offices such as Ministry of Artificial Intelligence (UAE), and Office of Artificial Intelligence and Artificial Intelligence Council (U.K.) while China and Japan have allowed existing ministries to take up Artificial Intelligence implementation in their sectoral areas. Not just national governments, but even local city governments have become increasingly aware about the importance and potential of Artificial Intelligence and have committed public investments.

National governments have significantly increased public funding for Artificial Intelligence through commitments such as increasing the R&D spend, setting up

industrial and investment funds in Artificial Intelligence startups, investing in network and infrastructure and Artificial Intelligence -related public procurements. China, USA, France and Japan have committed significant public spending for Artificial Intelligence technology development and adoption.

These countries are also leveraging different combinations of public-private-academia to develop and promote Artificial Intelligence. Development of technology parks, and connecting large corporations with startups and forming "national teams" with large private players to undertake fundamental and applied research are some of the public-private partnership approaches various national governments have espoused.

Artificial Intelligence technology development and applications are evolving rapidly with major implications for economies and societies. A study by EY and NASCCOM found that by 2022, around 46% of the workforce will be engaged in entirely new jobs that do not exist today, or will be deployed in jobs that have radically changed skillsets4. If some countries decide to wait for a few years to establish an Artificial Intelligence strategy and put in place the foundations for developing the Artificial Intelligence ecosystem, it seems unlikely that they would be able to attain and match up to the current momentum in the rapidly changing socio-economic environment. Therefore, the need of the hour is to develop a policy framework that will help set up a vibrant Artificial Intelligence ecosystem in India.

### 2.2. *COMPARISON WITH AI TRENDS IN DEVELOPED COUNTRIES*

While the adoption of AI in developing countries is accelerating, it is essential to contextualize these trends within the broader global landscape. Developed countries, often characterized by robust technological infrastructures and well-established innovation ecosystems, have been at the forefront of AI development and implementation. The trajectories of AI adoption in developed nations have been shaped by significant investments in research and development, a highly skilled workforce, and a conducive regulatory environment.

Developed countries have witnessed extensive integration of AI across industries,

with applications ranging from advanced robotics in manufacturing to sophisticated AI algorithms in finance and business analytics. The emphasis on AI-driven research and innovation in developed nations has propelled them into leadership positions in AI development and deployment.

The evolving landscape of AI adoption in developing countries underscores the transformative potential of these technologies in fostering inclusive development. As the gap narrows, developing nations have an opportunity to harness AI strategically, addressing local challenges and contributing to global innovation.

*Case Studies: AI Implementation in Selected Developing Countries*

Artificial Intelligence (AI) implementation in developing countries is marked by diverse initiatives that harness technology to address specific challenges and propel socio-economic development. This section presents case studies highlighting notable AI implementations in selected developing countries, showcasing the transformative potential of these technologies.

*Precision Agriculture for Smallholder Farmers:*

In India, where agriculture is a cornerstone of the economy, AI is being leveraged to enhance precision farming practices (Tiwari and Jaga, 2012, Rana, 2023). Companies like Crop In are using AI algorithms to analyze satellite imagery, weather data, and soil conditions. Smallholder farmers receive personalized recommendations for crop management, irrigation, and pest control through mobile applications. This AI-driven approach optimizes resource use, improves yields, and contributes to sustainable agriculture.

*Kenya: AI-Powered Healthcare for Remote Communities:*

In Kenya, where access to healthcare is often limited, AI is making significant strides in improving medical services (Ade-Ibijola, and Okonkwo, 2023). The company Ilara Health utilizes AI-driven diagnostic tools to enhance medical imaging analysis. This technology aids in the early detection of diseases, enabling timely intervention. Ilara Health's portable diagnostics also facilitate healthcare delivery in remote areas, addressing the challenges of distance and limited medical infrastructure.

*Brazil: AI for Environmental Monitoring in the Amazon Rainforest:*

Brazil is deploying AI to address environmental challenges, particularly in the Amazon rainforest. The Instituto Nacional de Pesquisas Espaciais (INPE) utilizes AI algorithms to analyze satellite imagery and monitor deforestation in real-time. This AI-driven approach helps authorities detect illegal logging and enforce environmental regulations. By combining AI with geographic information systems (GIS), Brazil aims to preserve the biodiversity of the Amazon and combat deforestation.

*Rwanda: AI in Education for Enhanced Learning:*

Rwanda has embraced AI in the education sector to enhance learning experiences (Harerimana, and Mtshali, 2020). The Smart Africa initiative collaborates with companies like Zindi Africa to implement AI-driven platforms that provide personalized learning content. These platforms adapt to individual student needs, supporting educators in delivering tailored educational experiences. AI in education in Rwanda aims to bridge educational gaps and improve learning outcomes.

*Vietnam: AI-Driven Chatbots for Financial Inclusion:*

In Vietnam, AI is being utilized to promote financial inclusion. The National Payment Corporation of Vietnam (NAPAS) employs AIdriven chatbots to provide financial information and services to individuals without access to traditional banking (Ha and Nguyen, 2022, Binh, 2018). These chatbots enable secure and convenient financial transactions, fostering financial inclusion in regions with limited banking infrastructure.

*Strategies for Bridging the Gap:*

The gap in AI implementation, particularly in developing countries, can be bridged through strategic and concerted efforts. This section outlines key strategies to address challenges and promote the inclusive deployment of AI technologies. To bridge the gap, significant investments in digital infrastructure are crucial. Governments and private entities should collaborate to improve broadband connectivity, ensure reliable power supply, and establish data centers. Accessible and robust infrastructure forms the foundation for effective AI implementation. Addressing skill gaps is paramount. Initiatives for capacity building and education in AI-related fields should be prioritized. This includes incorporating AI courses

into educational curricula, providing training programs for professionals, and fostering a culture of continuous learning. Partnerships between educational institutions, industry, and government bodies can facilitate knowledge transfer. The development of comprehensive AI policies is essential to ensure ethical practices and inclusivity. Governments should establish frameworks that address concerns related to bias,

### 2.3. *ARTIFICIAL INTELLIGENCE AND INDIA*

A national Artificial Intelligence strategy needs to be premised on a framework which is adapted to India's unique needs and aspirations, while at the same time, is capable of achieving the country's full potential of leveraging Artificial Intelligence developments. Such a framework could be seen as an aggregation of the following three distinct, yet inter-related components:

a) Opportunity: the economic impact of Artificial Intelligence for India
b) Artificial Intelligence for Greater Good: social development and inclusive growth
c) Artificial Intelligence Garage for 40% of the world: solution provider of choice for the emerging and developing economies (exChina) across the globe.

a) OPPORTUNITY: THE ECONOMIC IMPACT OF ARTIFICIAL INTELLIGENCE FOR INDIA

Artificial Intelligence is emerging as a new factor of production, augmenting the traditional factors of production viz. labor, capital and innovation and technological changes captured in total factor productivity. Artificial Intelligence has the potential to overcome the physical limitations of capital and labour, and open up new sources of value and growth. From an economic impact perspective, Artificial Intelligence has the potential to drive growth through enabling: (a) intelligent automation i.e. ability to automate complex physical world tasks that require adaptability and agility across industries, (b) labour and capital augmentation: enabling humans to focus on parts of their role that add the most value, complementing human capabilities and improving capital efficiency, and (c) innovation diffusion i.e. propelling innovations as it diffuses through the economy. Artificial Intelligence innovations in one sector will have positive consequences in another, as industry sectors are interdependent

based on value chain. Economic value is expected to be created from the new goods, services and innovations that Artificial Intelligence will enable.

Accenture, in its recent Artificial Intelligence research reports, provides a framework for evaluating the economic impact of Artificial Intelligence for select G20 countries and estimates Artificial Intelligence to boost India's annual growth rate by 1.3 percentage points by 2035.

b) *ARTIFICIAL INTELLIGENCE FOR GREATER GOOD: SOCIAL DEVELOPMENT AND INCLUSIVE GROWTH*

Beyond just the headline numbers of economic impact, a disruptive technology such as Artificial Intelligence needs to be seen from the perspective of the transformative impact it could have on the greater good – improving the quality of life and access of choice to a large section of the country. In that sense, the recent advancements in Artificial Intelligence seem to be custom-made for the unique opportunities and challenges that India faces. Increased access to quality health facilities (including addressing the locational access barriers), inclusive financial growth for large sections of population that have hitherto been excluded from formal financial products, providing real-time advisory to farmers and help address unforeseen factors towards increasing productivity, building smart and efficient cities and infrastructure to meet the demands of rapidly urbanizing population are some of the examples that can be most effectively solved through the non-incremental advantages that a technology such as Artificial Intelligence can provide.

c) *ARTIFICIAL INTELLIGENCE GARAGE FOR 40% OF THE WORLD*

In addition to providing unique opportunities, India provides a perfect "playground" for enterprises and institutions globally to develop scalable solutions which can be easily implemented in the rest of the developing and emerging economies. Simply put, Solve for India means solve for 40% or more of the world. An Artificial Intelligence based solution for early diagnosis of tuberculosis (one of the top-10 causes of deaths worldwide), for example, could easily be rolled out to countries in South East Asia or Africa, once developed and refined in India. Beyond healthcare, Artificial Intelligence technologies in the other sectors including agriculture, education and mobility are set to transform the world. The commonality of issues

with regard to the above sectors across developing countries provides the ideal use case of developing Artificial Intelligence solutions that could be adapted for multiple markets. Hence, Artificial Intelligence technologies suited for the Indian agricultural sector could easily be customized for other developing nations based on their local climatic conditions. Education continues to be a major concern in almost all developing countries. Artificial Intelligence technologies that are capable of imparting quality education to India's linguistically diverse population could prove very useful in other developing nations.

Another aspect of India's potential as a leader in Artificial Intelligence is it proven track record in technology solution provider of choice. Solved in India (or more accurately, solved by Indian IT companies) could be the model going forward for Artificial Intelligence as a Service (AIaaS). Indian IT companies have been pioneers in bringing technology products and developments as solutions across the globe. As Artificial Intelligence matures and generalized applications become common place, its advantage India when it comes to large scale implementation. Furthermore, India's competence in IT combined with opportunities, such as interoperability between multiple languages, provides the muchneeded impetus for finding scalable solutions for problems that have global implications, such as NLP.

### *3.4 THE RISE OF ETHICAL EXPECTATIONS AND REGULATIONS*

A recent review of AI ethics policies was published in January 2021 by researchers at the School of Public Policy at the Georgia Institute of Technology. They identified 112 documents prescribing AI ethics principles, frameworks, policies and strategies from 25 countries produced during 2016–2019. The documents were published by governments, companies and NGOs. The top five ethics topics covered in these documents were: (a) social responsibility; (b) transparency; (c) bias and fairness; (d) privacy; and (e) safety and reliability. It was found that 'public and NGO documents are more participatory in their creation and more engaged with the law' and that 'private-sector documents appear to be more concerned with client and customer-related ethical issues that may lend themselves to a technical fix'.

Overall, the study points towards a substantial expansion in AI ethics expectations across all sectors with the public and NGO sectors leaning towards future legislative implications. It complements several earlier studies examining the

development of AI ethics policies, laws, guidelines and frameworks across the globe. One study found convergence around five ethical principles across the globe: (a) transparency; (b) justice and fairness; (c) non-maleficence; (d) responsibility; and (e) privacy. All these topics feature in the AI ethics principles of the Australian Government, quoted as follows:

- *'Human, societal and environmental wellbeing:* AI systems should benefit individuals, society and the environment.
- *Human-centred values:* AI systems should respect human rights, diversity, and the autonomy of individuals.
- *Fairness:* AI systems should be inclusive and accessible, and should not involve or result in unfair discrimination against individuals, communities or groups.
- *Privacy protection and security:* AI systems should respect and uphold privacy rights and data protection, and ensure the security of data.
- *Reliability and safety:* AI systems should reliably operate in accordance with their intended purpose.
- *Transparency and explainability:* There should be transparency and responsible disclosure so people can understand when they are being significantly impacted by AI, and can find out when an AI system is engaging with them.
- *Contestability:* When an AI system significantly impacts a person, community, group or environment, there should be a timely process to allow people to challenge the use or outcomes of the AI system.
- *Accountability:* People responsible for the various phases of the AI system lifecycle should be identifiable and accountable for the outcomes of the AI systems, and human oversight of AI systems should be enabled.'

These principles are identified by the Australian Government as voluntary and intended to be 'aspirational and to complement – not substitute – existing AI regulations and practices. A recent review of the application of these principles was done by researchers at CSIRO.

As they look into the future and across the globe, it is possible that the currently voluntary and aspirational AI principles may become regulations and laws. A

recent April 2021 paper in the Harvard Business Review explores this issue and opens with the statement 'Over the last few weeks, regulators and lawmakers around the world have made one thing clear: New laws will soon shape how companies use artificial intelligence'. Examples of recent developments include:

On 31 March 2021 the five main financial regulators in the United States (including the Federal Treasury) issued an information request to financial institutions to provide detailed information on their use of AI and machine learning. They indicated the information provided is to help ensure 'compliance with applicable laws and regulations.

On 21 April 2021 the European Union proposed the first legal framework on AI which includes fines of up to 6% of company revenue for non-compliance. Furthermore, the European Union's general data protection regulation (GDPR) includes articles limiting the use of automated decision systems including requirements related to explainability and contestability.

Clearly there is a considerable pathway ahead before AI-specific laws are enacted across the globe. Sectors such as finance and retail may be at the forefront of these regulations due to their extensive and routine handling of confidential customer data. However, over the coming years and decades AI policies, regulations and laws are likely to increase. The science sector will be impacted along with other sectors; research organisations will need to ensure they are compliant. Furthermore, AI ethics go beyond compliance. There are also rising expectations for ethical AI from society, investors and AI researchers and developers themselves.

## CHAPTER – IV

Potential Usage and Barriers of AI

### 3. *POTENTIAL USE OF ARTIFICIAL INTELLIGENCE IN VARIOUS FIELDS.*

Artificial Intelligence has the potential to provide large incremental value to a wide range of sectors globally, and is expected to be the key source of competitive

advantage for firms.

*i) Healthcare:*

Application of Artificial Intelligence in healthcare can help address issues of high barriers to access to healthcare facilities, particularly in rural areas that suffer from poor connectivity and limited supply of healthcare professionals. This can be achieved through implementation of use cases such as Artificial Intelligence driven diagnostics, personalized treatment, early identification of potential pandemics, and imaging diagnostics, among others.

*ii) Agriculture:*

Artificial Intelligence holds the promise of driving a food revolution and meeting the increased demand for food (global need to produce 50% more food and cater to an additional 2 billion people by 2050 as compared to today). It also has the potential to address challenges such as inadequate demand prediction, lack of assured irrigation, and overuse / misuse of pesticides and fertilizers. Some use cases include improvement in crop yield through real time advisory, advanced detection of pest attacks, and prediction of crop prices to inform sowing practices.

*iii) Smart Mobility, including Transports and Logistics:*

Potential use cases in this domain include autonomous fleets for ride sharing, semi-autonomous features such as driver assist, and predictive engine monitoring and maintenance. Other areas that Artificial Intelligence can impact include autonomous trucking and delivery, and improved traffic management.

*iv) Retail:*

The retail sector has been one of the early adopters of Artificial Intelligence solutions, with applications such as improving user experience by providing personalized suggestions, preference-based browsing and image-based product search. Other use cases include customer demand anticipation, improved inventory management, and efficient delivery management.

*v) Manufacturing:*

Manufacturing industry is expected to be one of the biggest beneficiaries of Artificial Intelligence based solutions, thus enabling 'Factory of the Future' through flexible and adaptable technical systems to automate processes and machinery to respond to unfamiliar or unexpected situations by making smart decisions. Impact areas include engineering (AI for R&D efforts), supply chain management (demand forecasting), production (Artificial Intelligence can achieve cost reduction and increase efficiency), maintenance (predictive maintenance and increased asset utilization), quality assurance (e.g. vision systems with machine learning algorithms to identify defects and deviations in product features), and in-plant logistics and warehousing.

*vi) Energy:*

Potential use cases in the energy sector include energy system modelling and forecasting to decrease unpredictability and increase efficiency in power balancing and usage. In renewable energy systems, Artificial Intelligence can enable storage of energy through intelligent grids enabled by smart meters, and also improve the reliability and affordability of photovoltaic energy. Similar to the manufacturing sector, Artificial Intelligence may also be deployed for predictive maintenance of grid infrastructure.

*vii) Smart Cities:*

Integration of Artificial Intelligence in newly developed smart cities and infrastructure could also help meet the demands of a rapidly urbanizing population and providing them with enhanced quality of life. Potential use cases include traffic control to reduce congestion and enhanced security through improved crowd management.

*viii) Education and Skilling:*

Artificial Intelligence can potentially solve for quality and access issues observed in the Indian education sector. Potential use cases include augmenting and enhancing the learning experience through personalized learning, automating and expediting administrative tasks, and predicting the need for student intervention to reduce

dropouts or recommend vocational training.

Adoption of Artificial Intelligence by various sectors have been influenced by, among other factors, technical and regulatory challenges, but commercial implications have been the biggest determinant. While technical feasibility, availability of structured data, regulatory barriers, privacy considerations, ethical issues, preference for human relationship have all played their roles in determining the readiness of a sector for large scale Artificial Intelligence adoption; compelling business use cases (e.g. improved efficiency, accuracy, speed, forecasting and accurate decision making) that lead to direct impact on revenue and profitability have been the biggest driver for companies to pursue accelerated adoption of Artificial Intelligence. As illustrated in McKinsey Global Institute's Artificial Intelligence adoption and use survey, sectors leading the Artificial Intelligence adoption today also intend to grow their investment in Artificial Intelligence the most, thus further reinforcing the varying degrees of Artificial Intelligence adoption across sectors.

It comes as no surprise that Banking and Financial Services sector has been one of the leading sectors globally when it comes to Artificial Intelligence adoption, and India has also seen a steep increase in Artificial Intelligence based implementation in recent times. Existing and potential use of Artificial Intelligence in this sector include improved customer interaction through personalized engagement, virtual customer assistance, and chatbots; improved processes through deployment of intelligent automation in rule based back-office operations; development of credit scores through analysis of bank history or social media data; and fraud analytics for proactive monitoring and prevention of various instances of fraud, money laundering, malpractice, and the prediction of potential risks. Artificial Intelligence in this sector has also been employed in wealth management viz. robo-advisory, algorithmic trading and automated transactions.

Similarly, manufacturing sector, primarily automotive and assembly, has been one of the first sectors to implement advanced robotics at scale. The manufacturing sector in India hasn't been far behind, as reflected in a recent study by BCG, where India was ranked 3rd in the world in Artificial Intelligence implementation in

manufacturing, ahead of nations such as Germany, with 19% of companies in the sector already using Artificial Intelligence to a significant extent.

These trends have also been reflected in the nature of investment in research in India, with private sector initiatives such as the Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI), choosing to focus their efforts in applied research on sectors such as manufacturing analytics and financial analytics.

### 3.1. *BARRIERS FACING DEVELOPING COUNTRIES IN THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE*

Developing countries experience various barriers and challenges in the development of the AI industry and markets. First, limited datasets are available for AI projects and the available data are of questionable quality. Due to wrong, low quality and irrelevant data, many ICT projects targeted at the poor fail to deliver the benefits that are promised by the initiators of such projects.

One example is the "Index-based" crop insurance programs that have been promoted widely among small-scale farmers. The payment to a policyholder relies on satellite images to detect if extreme weather has affected a given area. The area may cover up to 1000 farmers. However, Canada's International Development Research Centre found that the promised benefits have not materialized because the technology gathers data on wide areas. It provides general views about the effects of drought or floods but fails to accurately measure rainfall at a local level. There have been cases in which satellite data indicated that an area had sufficient rainfall but some farmers experienced crop loss due to microclimates. They were not offered insurance payouts. Some discontinued their insurance schemes Second, in a discussion of AI's impacts on developing countries, it is also important to discuss noneconomic costs such as the loss of privacy. Such concerns exist at various stages from data gathering to develop AI applications to the actual use of AI. For instance, AI in China is being developed without giving sufficient considerations to ethical issues. Some countries are using AI to build surveillance tools that might violate privacy laws and human rights. These concerns have been especially strongly voiced against countries that have used China-developed solutions. China has sold AI and facial recognition software in developing countries such as Serbia, Turkey, Russia,

Ukraine, Azerbaijan, Angola, Laos, Kazakhstan, Kenya, Uganda Ecuador, Bolivian, and Peru. The Chinese company Cloud Walk works with the Zimbabwean government to develop a facial recognition program. China described this as a "win-win" deal. Chinese AI companies can train ML algorithms on Africans to diversify their datasets and Zimbabwe gets access to use the latest technology to monitor its population. Especially, deployment of China-developed solutions in countries with poor track records on human rights is a concern.

Third, some developing countries are using AI solutions developed by foreign companies, which often perform poorly and have limited usability. A Russian company is reported to be selling face recognition technology in South Africa and Kenya. These systems have a low level of accuracy and precision in Africa.

Other impediments include unsupportive regulatory and policy environments. Some countries have a history of cutting Internet connections to tackle problems as varied as cheating by students in exams and political unrest by activists. In June 2019, Ethiopia shut down the Internet for three days during national examinations to prevent students from cheating In January 2019, Zimbabwe disrupted Internet connectivity for a week due to concerns related to unrest in disputed elections.

## CHAPTER – V

Recommendations With Concluding Remarks

***CONCLUSION***

This paper is based on the concept of artificial intelligence, areas of artificial intelligence and its techniques. The field of artificial intelligence gives the ability to the machines to think analytically, using concepts. Artificial Intelligence will continue to play an increasingly important role in the various fields. We conclude that further research in this area can be done as there are very promising and profitable results that are obtainable from such techniques, while scientists have not yet realized the full potential and ability of artificial intelligence. This technology and its applications will likely have farreaching effects on human life in the years to come.

- Without counterbalanced technologies, the ongoing development of AI

will affect the current jobs. However, in developing countries, specifically in the manufacturing sector, the demand for labor will continue.

- The sensor technology of AI, for instance, image and speech recognition, will gradually replace human labor in relevant fields.
- Nurses, technicians, and other healthcare workers can benefit greatly from AI apps that collect and analyze data, allowing them to deliver a greater array of services and more accurate health advice, judgment, and treatment.
- AI focuses solely on computerizing labor-intensive tasks because they are likely to result in job losses, wage stagnation, and increased inequality.
- The improper form of Al, which focuses predominantly on automation, leans towards benefiting a small segment of influential people who are already wealthy and diplomatically strong, such as highly experienced experts and businesses that rely heavily on automation and data.
- It can be an engine for speeding up economic progress while also having the ability to restrain growth if the needed structure for its implementation is not in position.
- The consequences are still unknown and will be determined by various factors such as economic progress, persistent unemployment, population size, and the quality of human and physical resources.
- Vulnerable employment is less affected by digital transformation alone; instead, it is more tied to implementing labor laws and regulations.
- Allocating the right amount of funds to the right technologically intensive sectors and creating the right environment for digital market makers are all challenges.

AI has the power to drive positive change in third-world countries, addressing critical issues such as food security, healthcare access, education, and environmental conservation. By embracing AI responsibly and overcoming challenges related to infrastructure, skills, and affordability, these nations can unlock the full potential of this transformative technology. As AI continues to evolve, its role in sustainable development and poverty reduction in third-world countries is likely to become increasingly prominent, offering new hope for a brighter future.

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