STUDY MATERIAL

PROFESSIONAL PROGRAMME

ARTIFICIAL INTELLIGENCE, DATA ANALYTICS AND CYBER SECURITY – LAWS & PRACTICE

GROUP 1

ELECTIVE PAPER 4.4

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PROFESSIONAL PROGRAMME

ARTIFICIAL INTELLIGENCE, DATA ANALYTICS AND CYBER SECURITY – LAWS & PRACTICE

Artificial Intelligence (AI) to be a kinetic enabler for the growth of our digital economy, investments, and jobs. AI refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making. Initially conceived as a technology that could mimic human intelligence, AI has evolved in ways that far exceed its original conception. With incredible advances made in data collection, processing and computation power, intelligent systems can now be deployed to take over a variety of tasks, enable connectivity and enhance productivity. As AI's capabilities have dramatically expanded, so have its utility in a growing number of fields.

AI is emerging as a new factor of production, augmenting the traditional factors of production viz. labour, capital and innovation and technological changes captured in total factor productivity. AI 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, AI 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. AI 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 AI will enable.

On the other hand data is one of the primary drivers of AI solutions, and thus appropriate handling of data, ensuring privacy and security is of prime importance. Challenges include data usage without consent, risk of identification of individuals through data, data selection bias and the resulting discrimination of AI models, and asymmetry in data aggregation.

To ensure that Internet in India is Open, Safe, Trusted and Accountable, the Central Government, in exercise of powers conferred by the Information Technology Act, 2000 ("IT Act"), has notified the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 ("IT Rules, 2021"). The rules cast specific obligation on intermediaries vis-à-vis what kind of information is to be hosted, displayed, uploaded, published, transmitted, stored or shared. Intermediaries are also required to remove any content violative of any law for the time being in force as and when brought to their knowledge either through a court order or through a notice by appropriate government or its authorised agency.

In the light of above developments, this study material has been prepared to provide an understanding of AI, Data Protection and cyber security legislations which have direct bearing on the functioning of companies. The study material has been divided into three parts consisting of twenty study lessons. Part-I dealing with Legal & Compliance Perspective consists of Study Lessons 1 to 6, whereas Part-II dealing with Technological perspective consists of Study Lessons 7 to 15.

This study material has been published to aid the students in preparing for the Artificial Intelligence, Data Analytics and Cyber Security – Laws & Practice Elective paper of the CS Professional Programme. It has been prepared to provide basic understanding of some of the Artificial Intelligence, Data Analytics and Cyber Security legislations thereunder, which have a bearing on the conduct of corporate affairs. It is part of the educational kit and takes the students step by step through each phase of preparation stressing key concepts, principle, pointers and procedures.

The legislative changes made upto May 31, 2025 have been incorporated in the study material. In addition to Study Material students are advised to refer to the updations at the Regulator's website, supplements relevant for the subject issued by ICSI and ICSI Journal Chartered Secretary and other publications. Specifically, **students are advised to read "Student Company Secretary" e-Journal which covers regulatory and other relevant developments relating to the subject,** which is available at academic portal *https://www.icsi.edu/student-n/academic-portal/*. In the event of any doubt, students may contact the Directorate of Academics at academics@icsi.edu.

The amendments to law made upto 31st May of the Calendar Year for December Examinations and upto 30th November of the previous Calendar Year for June Examinations shall be applicable.

Although due care has been taken in publishing this study material, the possibility of errors, missions and /or discrepancies cannot be rules out. This publication is released with an understanding that the Institute shall not be responsible for any errors, omissions and/or discrepancies or any action taken in that behalf.

PROFESSIONAL PROGRAMME

Group 1

Elective Paper 4.4

ARTIFICIAL INTELLIGENCE, DATA ANALYTICS AND CYBER SECURITY – LAWS & PRACTICE

(Max Marks 100)

SYLLABUS

OBJECTIVE

To provide skills of high order regarding digital technological developments in emerging economic environment.

Level of Knowledge : Expert Knowledge

Part I : Legal & Compliance Perspective

1. **Artificial Intelligence ("AI") – Introduction and Basics :** Introduction : Meaning and Definition ● Emergence of AI in modern IT world ● ChatBots and Virtual Assistance: Boon or Bane ● Need and Significance for AI in cyberspace ● Challenges and Opportunities of AI ● AI and Cyber Security ● AI vs. Ethics and Morality ● AI vs. Law and Compliance ● Case Studies
2. **Cyber Security :** Cyber Security ● Cyber Security Techniques ● Challenges and Restrictions ● Cyber Security Policies – National and International ● International Convention on Cyberspace ● Cyber Security: Legal and Compliance Assessment
3. **Cyber Threats and Cyber Laws** : Introduction ● Cyber Threats - Cyber Warfare - Cyber Crime - Cyber Terrorism ● Types of Cyber Threats/ Attacks ● Cyber Threat Hunting and Digital Forensics ● Digital Intellectual Property ● Liability of online platforms ● Laws applicable to AI and Cyber Laws - Information Technology Act, 2000 ● Overview of IT Act, 2000, The important provisions of IT Act, 2000, Positive and negative aspects of IT Act, 2000, Information Technology Rules (IT Rules), Companies Act, 2013, Indian Penal Code, 1860, Cyber security Framework (NCFS), Data Protection and AI: Laws and Regulations
4. **Cyber Crimes and Investigation Procedures** : Computer Forensics and Digital Evidence ● Security Audit
5. **Regulatory Framework on AI, Cyber Security and Cyberspace :** E-Governance in India ● RBI Regulations governing AI, Cyber Security and Cyberspace ● SEBI Regulations governing AI, Cyber Security and Cyberspace ● International Principles governing AI, Cyber Security and Cyberspace ● Other Applicable Regulatory Framework
6. **Data Analytics and Law :** Introduction to Data Analytics ● Introduction to Legal Analytics ● Introduction to Machine Learning for Lawyers ● Quantitative Legal Prediction vis-à-vis Business of Law ● Bias/

Variance, Precision/Recall & Dimensionality ● Overfitting, Underfitting, & Cross-Validation ● Logistic Regression and Maximum Likelihood ● Triple C Theory and Data Assessment ● Network Analysis and Law

Part II : Technological Perspective

7. **Computer Hardware and Software :** An Introduction – Computer System Concept, Types, Categories and Emerging Technologies ● Components of a Computer System ● Primary and Secondary Storage ● Computer Storage Capacities ● Computer Peripherals – Inputs, Output and Storage Devices ● Computer Software: An Introduction ● Software Trends ● Multi-Programming, Multi-Processing, Time Sharing, Batch Processing ● On-Line and Real Time Processing ● Application Software

8. **Network Basics and Security :** Intranets ● Extranets ● Internet ● Networking concepts OSI models TCP/IP model ● Ports ● Secure protocols ● Common Network Attacks ● Network Devices Hubs ● Bridges Switch ● Security Devices ● Firewall

9. **Softwares and Software Security**

10. **Database Management :** Data Base Concepts ● Data Structure ● Data Base Management System ● Data Base Files ● Data Mining and Warehousing

11. **Data Analytics :** Data Recovery Tools ● Data Recovery Procedures and Ethics ● Gathering Evidence Precautions, Preserving and safely handling original media for its admissibility ● Document a Chain of Custody and its importance ● Complete time line analysis of computer files based on file creation, file modification and file access ● Recover Internet Usage Data ● Data Protection and Privacy ● Recover Swap Files/Temporary Files/Cache Files ● Introduction to Encase Forensic Edition, Forensic Toolkit ● Use computer forensics software tools to cross validate findings in computer evidence-related cases

12. **Information Systems :** Systems : An Overview ● Features and Qualities of Information ● Types of Information ● Process of Generating Information ● Value and Cost of Information ● Information Needs a Various Levels of Management ● Factors Influencing Information Needs ● Information System Activities ● Types of Information Systems ● Information Systems in Business Management ● Recent Trends in Information System

13. **Management Information Systems – An Overview** : Concept, Evolution and Elements ● Structure ● Computerized MIS ● Approaches of MIS ● Development ● Pre-requisites of an Effective MIS ● MIS and Decision Support Systems ● MIS and Information Resource Management ● Artificial Intelligence and Expert System

14. **Enterprise Resource Management**

15. **Internet and Other Technologies** : Applications of Internet ● Internet Protocols ● E-Commerce ● Nature, Types (B2B, B2C, C2C) ● Supply Chain Management ● CRM, Electronic Data Interchange (EDI) ● Electronic Fund Transfers (EFT) ● Digital Currency ● Block Chain Technology ● Payment Portal ● E-Commerce Security – Mobile Commerce ● Bluetooth and Wi-Fi

ARRANGEMENT OF STUDY LESSONS

ARTIFICIAL INTELLIGENCE, DATA ANALYTICS AND CYBER SECURITY – LAWS & PRACTICE

GROUP 1 • ELECTIVE PAPER 4.4

Part I : Legal & Compliance Perspective

Part II : Technological Perspective

LESSON WISE SUMMARY

ARTIFICIAL INTELLIGENCE, DATA ANALYTICS AND CYBER SECURITY – LAWS & PRACTICE

PART I : LEGAL & COMPLIANCE PERSPECTIVE

Lesson 1 – Artificial Intelligence ("AI") – Introduction and Basics

This lesson gives a thorough overview of the emergence of the concept of Artificial Intelligence (AI) as a branch of computer science, which is capable of performing operations that normally call for human intellect. It involves discussions on various types of AI, its usage in various sectors, introduction to Chatbots, Virtual Assistance along with challenges and opportunities for AI. It also elaborates upon the use of AI in Cyber security, the effects of AI on ethics and morality and the need for a legal and compliance framework to regulate the AI sector.

Lesson 2 – Cyber Security

This lesson focuses on Cyber Security, its significance and cyber-security techniques that can be used to protect against threats in the cyberspace. This lesson will also discuss the various challenges and restrictions of cybercrime and the various national and international cyber security policies formulated by nations over the world, including the International Convention on Cyberspace. Thereafter, an attempt will be made to look into the legal and regulatory framework concerning cybersecurity and the recent government initiatives in India in the area of cyber security.

Lesson 3 – Cyber Threats and Cyber Laws

This lesson focuses on cyber threats and the various types of cyber threats/ attacks that expose users to vulnerabilities in the cyber space, including web based and system-based attacks. Through the course of this chapter, an attempt will also be made to understand cyber threat hunting investigations and role of digital forensics in preserving digital evidence. Furthermore, this lesson will also trace the methods of protecting digital intellectual property and legal framework on liability of Intermediaries/Online Platforms in India. Important laws applicable to cyberspace and relevant case laws and case studies along with Indian legal perspective on data protection will also be looked into in this Lesson.

Lesson 4 – Cyber Crimes and Investigation Procedures

This lesson discusses cyber-crimes in the Indian scenario, including the various initiatives adopted by the government and investigative authorities to regulate and control cyber-crime in India. An attempt will be made to provide an easy understanding of the process regarding how to report a cyber-crime in India and step-by-step guide as to how the investigation of cyber-crimes takes place in India. This lesson will also elaborate upon concepts of computer forensics and digital evidence and its role in cyber security, chain of custody procedures, security audit, case studies and discussion on the Indian law on Cyber Terrorism.

Lesson 5 – Regulatory Framework on AI, Cyber Security and Cyberspace

This lesson will discuss the concept of e-governance in India along with an overview of the central government projects, state government projects and integrated initiatives on e-governance and digital India. An attempt

will also be made to trace the framework of the RBI as well as SEBI for governing Artificial Intelligence, Cyber Security and Cyber Space along with a look at its implications. This lesson will also give an overview of the international principles governing AI, Cyber Security and Cyber Space.

Lesson 6 – Data Analytics and Law

This lesson is based on data analytics, need and significance of data analytics, its types, processes and the different methods and techniques used by data analysts to effectively analyze the data. Students will also be introduced to the area of legal analytics and how it is implemented to legal practice. Discussion will also be made on machine learning for lawyers and its various uses, benefits, concept of quantitative legal prediction and its use in predicting case outcomes. The lesson will end with a discussion on bias and variance in machine learning and network analysis and law to understand the emerging AI trends in legal sector.

PART II : TECHNOLOGICAL PERSPECTIVE

Lesson 7 – Computer Hardware and Software

In this lesson, an attempt will be made to understand the computer system, its types along with all its constituent elements like hardware, software and liveware. After reading this lesson, students will be able to understand concepts like primary and secondary storage, computer peripherals and multiprogramming. This lesson will also include detailed discussion on software systems, its types, and the recent and emerging software trends.

Lesson 8 – Network Basics and Security

This lesson is aimed at fostering an understanding of network and computer security, with emphasis on understanding the different types of network and its operation. This lesson will further elaborate upon the need and implications of ensuring network security. After reading this lesson, students will get familiar with common threats to network security and measures that can be taken to avoid the same.

Lesson 9 – Softwares and Software Security

This lesson will outline the concept of software, its various types and functioning of software security mechanisms. The Indian legal and regulatory framework on software security will be explored in depth along with analysis of various case laws and case studies in the Indian scenario. The lesson will conclude with a discussion on recent trends in software security, what to avoid in software security and best practices of software security.

Lesson 10 – Database Management

This lesson will explore the concept of database with the basics of data structure, followed by discussion on database abstraction, implementation and creation. An attempt will be made to familiarize the students with database management system, its components, advantages and its applications. Concepts of data mining, warehousing and data base files will also be discussed in detail.

Lesson 11 – Data Analytics

In this lesson, students will learn about data recovery, its tools, procedures, types and data recovery ethics, in the light of data analytics. This will be followed by discussion on gathering evidence for its admissibility in court of law, duplication and preservation of digital evidence, legal aspects of collecting and preserving computer, digital IDs and authentication and importance of chain of custody. Students will be able to understand the different nuances of identification, preservation and analysis of evidence related to data analytics.

Lesson 12 – Information Systems

This lesson will look into the meaning and concept of information system, its application in different spheres of business and the various types of information system along with key features, advantages, disadvantages and function of such information system. This will be followed by a discussion on information systems and security and application of information systems in daily life situations.

Lesson 13 – Management Information Systems – An Overview

This lesson will foster an understanding of the management information system, its components and utilization of management information system in Indian business world. Thereafter, the student will be introduced to the inter-relationship between management information system with other information systems and applications of management information system. The lesson will conclude with a discussion on management information system and security.

Lesson 14 – Enterprise Resource Management

This lesson will delve into the concept and meaning of Enterprise Resource Planning (ERP), its advantages, disadvantages and functioning of ERP systems. This will be followed by discussion on ERP related technologies, ERP system modules, planning, evaluation and selection of ERP systems. The lesson will end with a discussion on recent trends in ERP in 2023.

Lesson 15 – Internet and Other Technologies

This lesson will comprehensively discuss the concept of internet, internet technologies and internet protocols, followed by discussion on e-commerce and its benefits, limitations and development. This lesson will also discuss important concepts of Supply Chain Management, Customer Relationship Management, Electronic Data Interchange, Electronic Fund Transfers. Furthermore, this lesson will contain an elaborate discussion on Digital Currency and its types, block chain technology and payment portals. The lesson will conclude with a discussion on mobile commerce, its types, working, future trends and its comparison with traditional e-commerce.

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LESSON 5

REGULATORY FRAMEWORK ON AI, CYBER SECURITY AND CYBERSPACE

LESSON 6

DATA ANALYTICS AND LAW

PART II : TECHNOLOGICAL PERSPECTIVE

LESSON 7
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NETWORK BASICS AND SECURITY

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PART I

LEGAL & COMPLIANCE PERSPECTIVE

Artificial Intelligence ("AI") – Introduction and Basics

Lesson 1

KEY CONCEPTS

■ Artificial Intelligence ■ ChatBots and Virtual Assistants ■ Use of Artificial Intelligence in Cyberspace ■ Challenges in Implementing AI Technologies ■ Legal Trends in India related to Artificial Intelligence

Learning Objectives

To understand:

- The concept of Artificial Intelligence
- And get an idea about basic uses of Artificial Intelligence
- The AI technology with its pros and cons
- The Challenges faced in implementing AI
- And get an idea about recent Legal trends in AI
- The ethical questions related to AI

Lesson Outline

- Introduction
- The Emergence of Artificial Intelligence in a Modern IT World
- ChatBots and Virtual Assistance: Boon or Bane
- Need and Significance of AI in Cyberspace
- Challenges and Opportunities of AI
- AI and Cyber Security
- *AI* v. *Ethics & Morality*
- *AI* v. *Law and Compliance*
- AI and Intellectual Property Laws
- Efforts of Government of India on Artificial Intelligence
- Case Studies
- Lesson Round-Up
- Test Yourself
- List of Further Readings
- List of Other References

INTRODUCTION

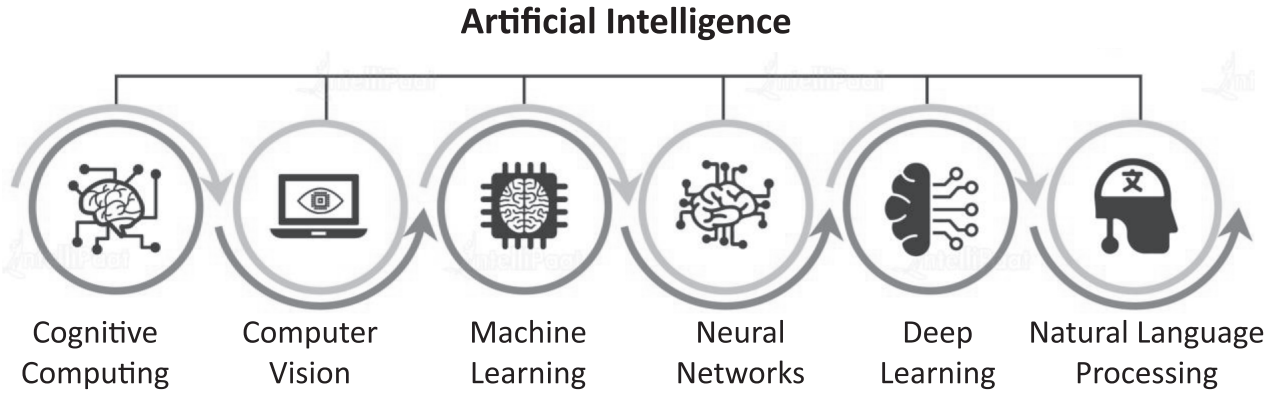
Artificial Intelligence ("AI") is a branch of computer science and engineering that focuses on developing devices and programmes that are capable of carrying out operations that ordinarily call for human intellect, such as comprehending natural language, identifying objects, and forming judgements. As per the Investopedia, Artificial Intelligence (AI) is defined as the simulation of human intelligence by software-coded heuristics. Nowadays this code is prevalent in everything from cloud-based, enterprise applications to consumer apps and even embedded firmware.

Interesting Fact[1]

The year 2022 brought AI into the mainstream through widespread familiarity with applications of Generative Pre-Training Transformer. The most popular application is Open AI's ChatGPT. The widespread fascination with ChatGPT made it synonymous with AI in the minds of most consumers. However, it represents only a small portion of the ways that AI technology is being used today.

Depending on the situation, several interpretations of AI's significance can be made. The capacity of computers to display intelligent behaviour, such as learning, thinking, and problem-solving, is at the heart of Artificial Intelligence (AI). Yet, the technology or environment in which AI is utilised can also have an impact on what it means.

Artificial Intelligence, for instance, pertains to a machine's capacity to comprehend and produce human language in the context of natural language processing. Artificial Intelligence (AI) can also refer to a machine's capacity to comprehend and engage with the physical environment.



Source: https://intellipaat.com

Under this background, this lesson aims to introduce the concept of AI, explore its meaning and definition.

Artificial Intelligence: Characteristics

The goal of Artificial Intelligence (AI), which an interdisciplinary study, is to develop intelligent computers that can carry out activities that ordinarily require human intelligence. AI aims to create robots that can reason, learn, and understand like humans, and that are able to solve challenging issues and adapt to evolving circumstances.

The ideal characteristic of artificial intelligence is its ability to rationalize and take actions that have the best chance of achieving a specific goal. A subset of artificial intelligence is Machine Learning (ML), which refers to the concept that computer programs can automatically learn from and adapt to new data without being

1. Source: https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp

assisted by humans. Deep learning techniques enable this automatic learning through the absorption of huge amounts of unstructured data such as text, images, or video.

Several sectors, including healthcare, banking, transportation, and entertainment, can benefit from the use of AI. For instance, AI-powered autonomous cars can increase transportation safety and efficiency while AI-powered medical imaging technologies can assist doctors in providing more precise diagnoses.

Key Takeaways

- Artificial Intelligence (AI) refers to the simulation or approximation of human intelligence in machines.
- The goals of artificial intelligence include computer-enhanced learning, reasoning, and perception.
- AI is being used today across different industries from finance to healthcare.
- Weak AI tends to be simple and single-task oriented, while strong AI carries on tasks that are more complex and human-like.
- Some critics fear that the extensive use of advanced AI can have a negative effect on society.

In conclusion, artificial intelligence is a fast-expanding topic that entails the creation of computer devices capable of carrying out operations that normally call for human intellect. AI is a fast-developing field that aims to alter how humans live, work and interact with the world around us. AI is intended to be independent and intelligent.

EVOLUTION OF ARTIFICIAL INTELLIGENCE

John McCarthy, the founder of artificial intelligence, provided the original definition of the word in 1955, essentially stating: “The goal of AI is to develop machines that behave as though they were intelligent”.

The science of Artificial Intelligence (AI), which is expanding quickly, is transforming the manner we operate, live, and interact with the environment. The creation of computer systems with Artificial Intelligence (AI) is what allows them to do things like understand language, acquire, organize, solve problems, and make decisions—tasks that would ordinarily need human intellect.

Although the idea of artificial intelligence has been known since the 1950s, it has only recently gained widespread recognition. AI is currently employed in a wide range of industries, from voice assistants like ‘Siri’ and ‘Alexa’ to self-driving automobiles and medical diagnosis, owing to developments in machine learning and deep learning.

The study of Artificial Intelligence (AI) spans a wide range of technologies and methodologies. Building systems that can acquire information and adjust to changing conditions is at the heart of artificial intelligence. A mix of algorithms, data processing methods, and numerical simulations are used to do this.

The fact that AI is built to be independent is one of its fundamental qualities. This implies that AI can make decisions independently of human input. However, the autonomy that gives AI its strength also comes with several grave difficulties. It may be difficult to comprehend why such an AI system committed an error and how to fix it, for instance, if the system makes one.

The fact that AI is clever by design itself is another important feature. This intelligence may manifest itself in a variety of ways, from the capacity to spot data trends to the capacity for deliberation and judgement. Although it is the eventual objective of AI, there is still a long way for development of machines that can replicate human intellect.

A rapid emerging field among technology is AI that is rapidly evolving with each passing day. The potential of AI systems is always growing as new methods and algorithms are created. So, a large increase in the number of AI technologies is to be anticipated in the upcoming years.

Examples of Artificial Intelligence[2]

AI is used in different types of technologies. For example,

- Machine Learning – It helps computers act without the need for programming. There are three types of machine learning.
- Supervised learning – Patterns can be recognized using labeled data sets and then used to label new data sets.
- Unsupervised learning – Data sets can be sorted according to how similar or different they are.
- Reinforcement learning – The AI system is given feedback after actions are performed.
- Automation – Tasks can be enhanced when automation tools are coupled together with AI. Big enterprise jobs can be automated while the intelligence from AI is passed on to process changes.
- Machine Vision – Machine Vision uses a camera, digital signal processing, and analog-to-analog conversion, to capture and then analyze visual information. It is used in signature analysis to medical analysis.
- Self-driving Cars – Automatic vehicles use deep learning, image recognition, and machine vision to make sure the vehicle stays in the proper lane as well as dodges pedestrians.
- Robotics – Robotics is an engineering field that focuses on the designing and manufacturing of robots. Nowadays, Machine Learning is being used to build robots so that they can interact with society.

Types of Artificial Intelligence[3]

There are four types of AI:

Reactive Machines	*Limited Memory*	*Theory of Mind*	*Self-Awareness*
• Simple classification and pattern recognition tasks	• Complex classification tasks	• Understands human reasoning and motives	• Human-level intelligence that can by-pass human intelligence too
• Great when all parameters are known	• Uses historical data to make predictions	• Needs fewer examples to learn because it understands motives	• Sense of self-consciousness
• Can't deal with imperfect information	• Current state of AI	• Next milestone for the evolution of AI	• Does not exist yet

THE EMERGENCE OF ARTIFICIAL INTELLIGENCE IN A MODERN IT WORLD

Although artificial intelligence has been available for a long time now, it has only recently become a significant technical breakthrough in the current IT industry. AI has improved substantially in recent years thanks to

2. Reproduced from https://intellipaat.com/blog/what-is-artificial-intelligence/#no2

3. Reproduced from https://intellipaat.com/blog/what-is-artificial-intelligence/#no2

developments in computing power, storage systems, and algorithmic methods. With the advent of AI in the contemporary IT world, its effects on humanity have handed numerous benefits.

The History of AI

The first attempts to create technologies that could replicate human intellect were made in the 1950s, which is when Artificial Intelligence (AI) was first explored. Rule-based technologies, which were designed with a set of guidelines to carry out particular tasks, were the foundation for initial AI systems. These systems had constrained capacities and were able to carry out the tasks that were specified in their programming.

During 1980s, AI systems started to advance more toward advanced structures like neural networks, which mimic the functioning of the human brain. As a result, innovations in speech processing, language processing, and picture identification occurred, laying the groundwork for current artificial intelligence.

Advent of Contemporary AI

AI has just become a significant technological development in the current IT industry. With the development of datasets, cloud technology, and cutting-edge techniques, AI systems can now analyse vast quantities of data, learn from that, and base recommendations or conclusions on it.

The two primary kinds of AI systems are specific AI and general AI. Narrow AI is created to carry out particular functions, such language translation or picture identification. Contrarily, general AI is intended to be intelligent like humans and to be able to reason and learn in a variety of contexts.

AI's influence on Modern Society

AI's advent has had a big effect on modern society, both for the better and worse. Positively, artificial intelligence has the ability to completely transform a variety of sectors, including healthcare, transportation, and finance. For instance, AI-powered autonomous cars can increase transportation safety and efficiency while AI-powered diagnostic imaging technologies can assist doctors in providing more accurate diagnoses. Concerns exist, nevertheless, on how AI will affect society.

The possibility that AI may displace human labour in many areas, resulting in mass layoffs and economic instability, is one of the main worries. Concerns exist over AI's use in monitoring and command, as well as its potential for unethical uses such militarization or cyberattacks.

Growth of AI vis-à-vis Indian Vision: Glimpse of Future of India

The News article of Ujjal De in ABP Live (March 16, 2023)[4] highlighted the fact that AI is still an integral part of the Union Budget 2023 as it shows the Government's continuous commitment to driving the mission. As India stands has already left China behind to be the most populous country in the world[5], it now holds immense responsibility to decide the future of education, employment, and skill development of nearly one-fifth of the global population. With 65 percent of the population under 35 in contrast to a mostly ageing population of developed countries, India's human capital impact is no longer regional. In the roadmap to becoming the next economic powerhouse and spearheading Industry 4.0 initiatives, the government is taking significant initiatives to rank India at the top of several technological capabilities, including Artificial Intelligence (AI).

AI Announcements in Union Budget 2023

- In 2018, the Government's apex public policy think-tank NITI Aayog proposed the creation of Centers of Excellence (CoEs) for AI learning and development.

4. Reproduced from De Ujjal (March, 2023) Make AI Work For India: What The Future Holds For Artificial Intelligence, ABP Live India.

5. See, https://thewire.in/society/india-china-highest-populated

- The fact that AI is still an integral part of the Union Budget 2023 shows the government's continuous commitment to driving the mission; the vision is clear: 'Make AI in India and Make AI work for India,' as outlined by Finance Minister Nirmala Sitharaman during her Union Budget address.
- Some of the announcements provided a glimpse into the plans for India's AI implementation:
  - Set up three CoEs in top educational institutions for advanced AI research and development. It can develop next-generation AI solutions and also address the growing talent demand.
  - Increase AI usage and partner with industries for the R&D of scalable solutions in agriculture, health, and sustainable cities. Projects like Digital India BHASHINI and Digi Yatra can be the stepping-stone for large-scale AI implementation across all major sectors.
  - The Government will launch a National Data Governance Policy to enable widespread access to anonymized data and boost innovation for startups and academia.
  - Pradhan Mantri Kaushal Vikas Yojana (PMKVY 4.0) will be upskilling lakhs of youths and aligning courses with industry needs, such as AI, IoT, etc., in the next three years.

Earlier in 2023, Minister of State for Electronics and Information Technology mentioned at the first India Stack Developers Conference that India Stack 1.0 version would evolve and become more sophisticated and nuanced with the integration of the AI layer into the stack.

Increase in AI Usage in Various Sectors

- A comprehensive approach to building cloud infrastructure, 5G connectivity, data centres, and access to quality talent can increase the AI adoption rate.
- Already a leading IT services and offshoring destination, India is making products for global markets and steadily implementing AI solutions to harness the massive volume of domestic data.
- The coronavirus-induced pandemic catapulted the digitalization pace as the larger population embraced digital technologies like UPI (digital payment platform), CoWIN (Covid-19 vaccination portal), and DigiLocker (digital document repository).
- India's manufacturing sector aims to be a trillion-dollar sector and contribute 25 percent of the national GDP by 2025.
- With a continuous increase in technology spend, AI adoption is gaining momentum in shopfloor automation, predictive maintenance, and reduced wastage.
- The Banking, Financial Services, and Insurance (BFSI) sector is witnessing a rapid digital transformation with the increased demand from the tech-savvy working population.
- With a total banking asset of $2.67 trillion in 2022, India's key focus is improving the tech infrastructure to enhance customer experience. With an initial implementation in payments and wallets, AI solutions are making their mark in digital lending, insurance, and investment processes.
- The retail sector in India contributes to 10 percent of the country's GDP and 8 percent of employment. Improved digital connectivity has aided e-commerce to trigger a surge in consumption in cities and rural areas. The FMCG sector is growing at a CAGR of 14.9 percent to reach $220 billion by 2025, and more and more brands are focusing on digital advertising to increase their consumer base.
- AI solutions are at the forefront of data-driven analysis and decision-making like demand forecasting and marketing spend optimization.
- The healthcare market has grown three-fold at a CAGR of 22 percent between 2016–22 and is one of the largest employers in India. Rising income levels and the post-pandemic shift toward preventive healthcare have increased investment in high-end health tech products and facilities.

- Organizations are exploring viable use cases through PoCs in cutting-edge healthcare technologies ranging from remote diagnostics, robotic surgeries and preventive analytics.
- Tech giants like Google and Microsoft heavily invest in AI research and development in India.
- Google Research India Lab is working on the ethical implementation of AI to transform healthcare, agriculture, wildlife conservation, and education. It also implements machine learning (ML) solutions to understand multilingual and multicultural nuances and improve Google’s apps and services like search, assistant, and payment.
- Besides the data-intensive core sectors, AI is gaining a prominent foothold in digital-first sectors like telecom, tourism, education, digital media, and entertainment.
- Microsoft India Development Center (MSIDC) is also working on various projects ranging from theory to advances in large-scale AI models. Project Jigsaw deals with large pre-trained language models such as GPT-3, and Project LITMUS discovering strategies to evaluate massive multilingual models are some projects initiated in the last few years.

Future of AI in India

An IDC report projected India’s AI market to reach $7.8 billion by 2025, growing at a CAGR of 20.2 percent. Organizations will invest in AI solutions across functions like customer service, HR, IT automation, security, etc.

India has already built an edge in AI talent. The latest NASSCOM report ranks India first in terms of AI skill penetration and also in AI talent concentration globally. The rich and massive digital talent pool is rapidly upskilling for AI and catering to the talent demand in India and overseas.

Despite the government’s ongoing skilling initiatives and development of the infrastructural framework, the NASSCOM AI Adoption Index 2022 positions India in the middle of the maturity scale, revealing the need for enterprises to scale up their AI initiatives significantly.

Organizations should embed their AI strategy with the broader corporate strategy and invest more in developing data standards and building dedicated AI teams.

The emergence of platform-agnostic AI solutions delivered on-demand over the cloud is helping organizations reduce deployment and maintenance costs, scale AI projects, and witness sustaining business outcomes. Implementing regulatory policies that ensure data protection, continuous government support, and a high concentration of qualified talent puts India in a unique position to expand its AI ecosystem and become the global leader.

Concluding Remarks

AI’s future holds both promise and uncertainty. AI has the ability to change a variety of societal spheres, including healthcare, academics, and entertainment. Yet there are additional obstacles to be addressed, such moral dilemmas, security issues, and legal problems.

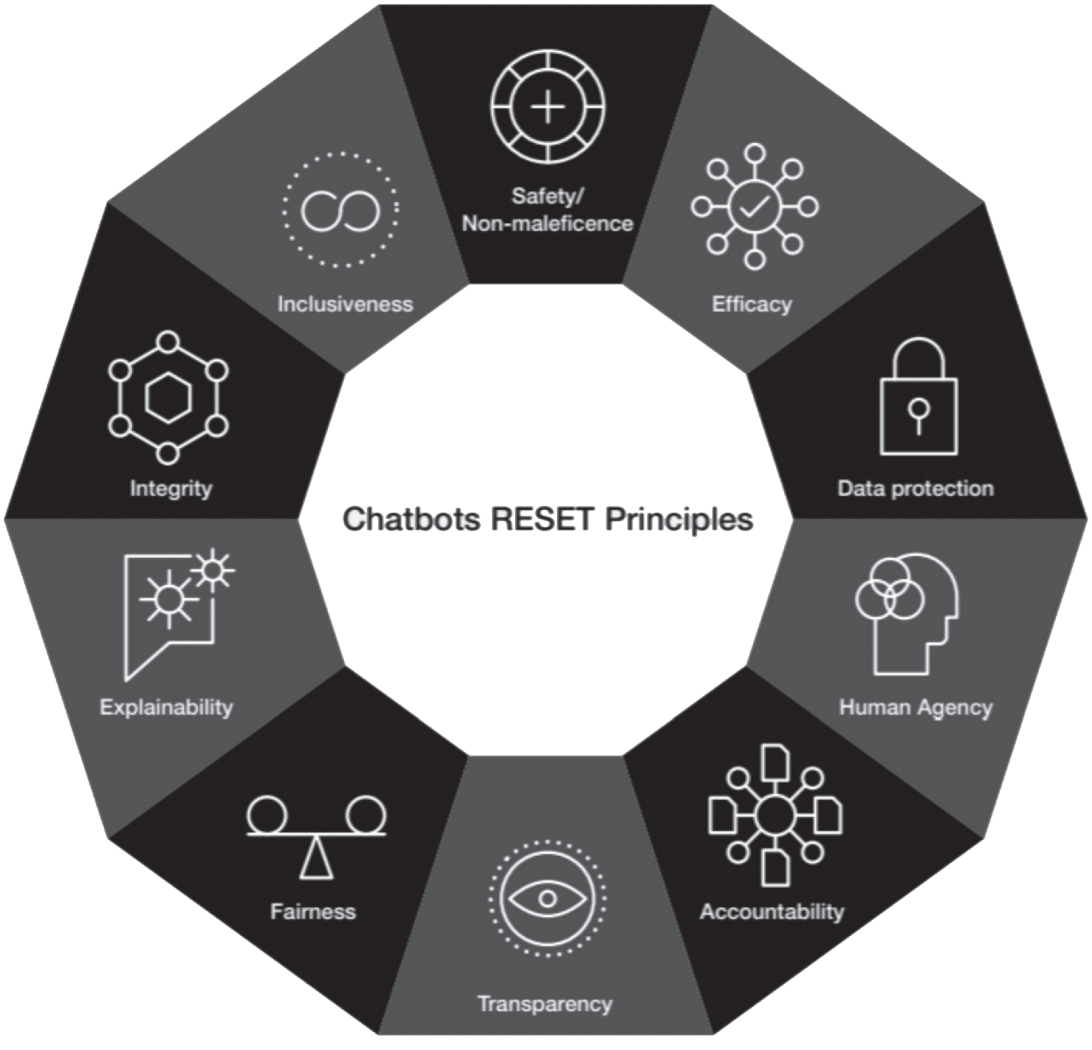
The creation of general AI, which has the potential to outperform human intellect and resolve challenging issues across several disciplines, is one of the major fields of AI study. Yet there are also worries about the dangers of developing highly intelligent AI, which, if not adequately controlled, may endanger human survival.

However, the growth of AI in today’s IT industry is a big one that has the potential to change a lot of facets of mankind. The hazards must be properly managed, though, in order to guarantee that AI is created in a competent, moral, and responsible way.

CHATBOTS AND VIRTUAL ASSISTANCE: BOON OR BANE[6]

Virtual Assistant, referred to as an AI assistant, is one that can recognize natural language audio instructions and carry out the user's requests to fulfill and accomplish tasks. Previously, a personal assistant or secretary would handle activities including taking dictation, reading aloud email or text messages, searching up phone numbers, organizing, making phone calls, and alerting the user of scheduled appointments. Nowadays, Google Assistant, Apple's Siri, Amazon Alexa, and Microsoft's Cortana are some of the most well-known virtual assistants.

On the other hand, a chatbot is a software package that mimics human conversation using text or voice inputs. It can provide customer support, carry out activities automatically, or even sell goods. Despite the fact that chatbots have been around for a while, current developments in Artificial Intelligence (AI) have made them more realistic and valuable than before. During the last few years, there has been a significant surge in the adoption of chatbots online and many businesses are using them every day.



Source: World Economic Forum

6. Source: Sinha Smita (2018) Is Chatbot a Boon or Bane? Here's why Companies Are Using Them Despite Tech Gliches. Analyticsindiamag.com

Chatbots as well as Virtual Assistants which were previously considered as cutting-edge innovation/ technology - are now commonplace for businesses. Over fifty thousand known chatbots are available in the marketplace and the majority of them focus on consumers, while just a tiny subset of these serves business purposes. According to recent patterns, the perception of chatbots and virtual assistants being backed by artificial intelligence as viable professional solutions might improve engagements at the company level and help the businesses to expand.

Advantages of Using ChatBots and Virtual Assistance:

- **Minimizing Operational Expenses:** Responding to consumer inquiries is a substantial expense for e-commerce companies because they need to employ, train as well as pay customer service personnel. According to a data analysis, chatbots and virtual assistance could lower a company’s operating costs by up to thirty per cent.
- **Time Saving:** Customers’ questions can be answered by such technologies by using datasets. They are capable of handling data more accurately thanks to their clever algorithms and programmes. Time that would otherwise be wasted is greatly reduced and productivity increases. Like for example, when selecting an applicant from a huge pool of applications, bots may be used to screen the prospects by posing pertinent questions.
- **Minimizing Error:** Chatbots and Virtual Assistants do not have the same tendency to overlook information as people do. Hence, the chance of someone committing a mistake is eliminated. Also, the quick response time and accurate responses increase client satisfaction to a greater extent. As a result, businesses may use such technologies to perform various human activities and accordingly, the personnel who might typically be hired for duties involving customer support might be assigned other crucial jobs.
- **24X7 Availability:** Chatbots and Virtual Assistants may be utilized anytime to offer customer support online and they do not take time off unlike humans. Users won’t have to wait for assistance when they browse on the internet or visit a particular website. Visitors can ask the virtual assistant/ bots for assistance to find the solutions on their own respective devices or online. Thus, one of the finest client engagement methods is to have a chatbot deployed on your website. According to statistics, sixty-four per cent of web users concur that a Chabot’s’ 24X7 availability is their greatest advantage.
- **Higher Conversion Rate:** According to estimates, nearly thirty-seven per cent of web users consult a user support bot to receive answers to urgent questions. Chatbots can help any website convert more visitors by promptly and effectively responding to their questions.
- **Increases Customer Satisfaction:** Customers frequently find information systems to be extensive and complicated to effectively answer their questions. Chatbots can be used to resolve this. They can handle heavy traffic while still offering reliable service. Moreover, they guarantee a positive customer interaction and contentment. So, this considerably increases customer satisfaction and minimizes discontent. According to studies, businesses that maintain their consumers’ interest in them might increase overall revenues. Incorporating chatbots on the website and incorporating them into well-known networking sites may communicate with the visitors and increase conversion rates.
- **Finding Promising Clients:** Chatbots can help any business achieve its primary objective of creating plenty of prospects and converting them into clients. One may get the chatbots to deliver the qualified leads by using smart qualifying criteria. This might subsequently speed up the sales process of any business.

Latest Trends

The overwhelming majority of internet users wish to connect with brands/businesses. It is due to the fact that a quick and simpler solution is available this way. Utilizing chatbots allows businesses to reach a wider range of consumers while also staying up to date with current developments.

- **Enhanced Client Support**

  There are several ways by which virtual assistants and chatbots may enhance customer service. The best method to provide the consumers the assistance they need while purchasing something is to act as a live marketing advisor. Nearly eighty-three per cent of potential online shoppers want answers to their questions regarding money, shipping, etc. answered as they browse through the website. Moreover, the virtual assistants also help the customer/user in finding the desired result without the hassle of going through a large database of information.

- Also, as previously indicated, providing round-the-clock services without making any customers wait in line is the basic objective. They also improve customer service by engaging with consumers whenever they want to regarding any problem. This enhances a consumer's perception of any business or brand.
- The benefits of such technology outweigh any technological flaws, making such tech the prevailing trends that are also anticipated to last a long time. As a result, companies are using them more and more for diverse reasons.
- Nowadays, extremely interactive and context-aware AI tools may be created by utilizing massive datasets and substantial training. These technologies can even recollect consumer behavior and associated information from prior discussions and apply those observations to appropriately handle client inquiries.
- The knowledge may also be improved and organized to make it more bot-friendly. It will allow the AI to analyze the information effectively and find the best answers according to the client's demand. Also, such technologies can be trained to speak to the clients effectively. One may even think about instructing it to exhibit emotions if needed during a conversation.

Demerits of Using ChatBots and Virtual Assistance:

The technological resources currently available are insufficient to create a Chatbot that can manage complicated questions. There has never been a chatbot that has achieved complete recognition. Following are some drawbacks of chatbots:

- **Information is Less Secure**

  Chatbot security isn't very good. They can allow hackers entry to any company's network, user information, datasets, and apps through their interface. Hence, businesses utilising chatbots must think about issues including the lifetime of the data and how it is preserved, utilized, and who has access to it. For industries like banking and finance that handle highly confidential customer data, it is indeed crucial that some precaution must be taken.

- **Restricted Pre-Programmed Responses**

  Chatbots can only respond to clients with replies from a small array of databases. However, not all clients will find their questions resolved by using these. Also, considering they don't always grasp what is being requested, interactions could get tedious for consumers if they go round in loops. The initial investment would be significant if someone chooses a smart bot with a sizable dataset.

- **Apparent Incapability to Determine**

  Chatbots are unable to make judgements the same way that people do. Your chatbot might not be

able to handle the issue raised by the consumer if your knowledge base doesn’t have the solutions to their questions. In order to make your content chatbot-friendly, one must organize and expand it. It will make it possible for the bot to scan the information efficiently and find the best answers to each customer’s requirements. Also, one must prepare it so that it can interact well with the customers.

- **AI/ChatBots/Virtual Assistance Lack Emotions**

  To communicate effectively, emotions are necessary. Bots may be exceedingly impersonal and devoid of sentiments, in contrast to humans. These can manage client queries according to predetermined discussions only if the interaction flow follows the path provided. Yet, if a subject suddenly changes, they could become perplexed & find it difficult to respond. Also, because they lack sentiments and impulses, they sometimes find it difficult to interact positively with people.

Concluding Remarks

Notwithstanding their flaws, chatbots are being used by organizations and institutions all over the world on an increasing basis. The reason for this is because their benefits exceed their drawbacks. Indeed, bots and AI assistants are a future trend. They are still in their development stage and have not yet reached their entire capabilities, but due to their increasing use by organizations, they belong in this technological age. In the upcoming years, improvements in machine learning and artificial intelligence will contribute to furthering the innovation and technology. Businesses will use it more frequently as a result to keep their focus on the client.

For business owners to effectively manage their customer service and marketing practices, bots may be a huge help. These technologies must be taken with caution because just like any other technology, these also have certain drawbacks. Before selecting if a chatbot is right for the business, owners must investigate all of the alternates available. Effective chatbot deployments can offer significant insights into what functions and what does not while using chatbots. Chatbots may be a potent tool for entrepreneurs to keep one step ahead of the other competitors while deploying the correct strategy. Organizations may save resource and money by automating particular operations while providing clients with the ease of round-the-clock access.

There are a few significant downsides to adopting chatbots, like user privacy issues or the possibility for AI algorithms to malfunction, it is crucial to balance the benefits and drawbacks when thinking about such technologies. Chatbots may be highly advantageous to any organisation across a wide range of sectors when used with caution and in accordance with highest ability for ethical database processing. Making sure that chatbots and virtual assistants are utilised in a responsible and ethical way requires taking a careful strategy to their creation and execution.

NEED AND SIGNIFICANCE OF AI IN CYBERSPACE[7]

Artificial Intelligence (AI) is a branch of computer science where a machine is made capable of possessing human decision-making ability, based on certain unique algorithms and related mathematical calculations. On the other side, Cyber Security consists of security measures to protect the virtual world from cyber-attacks and threats. Artificial Intelligence is capable of securing and cleaning up the cyberspace by taking security measures related to accurate algorithms and mathematical calculations. With an increase in the role of AI in modern world threat to cybersecurity has become a serious issue.

AI is vital for the management of cyberspace, which includes all digital networks, devices, and information systems. AI in this world has emerged as a crucial component. The amount of information stored in the online world is exploding, making it impossible to manage and secure cyberspace using conventional methods. AI is a useful tool for managing the intricacy of cyberspace and the risks that are continuously changing because of its capacity to understand and adjust in real-time. The importance and necessity of AI in cyberspace are covered in this chapter.

7. Source: https://www.geeksforgeeks.org/significance-of-artificial-intelligence-in-cyber-security/

AI's requirement in Cyberspace

Although the web has become an essential component of modern life, the number of digital risks has also skyrocketed along with its use. Threats on people, companies and governments are conducted by cybercriminals using highly technical tools and methods. In order to defend against all of these attacks, standard security methods like firewalls, antivirus software, and systems for detecting intrusions are no longer effective. AI can help in this situation. Massive volumes of data may be analysed in real-time by AI systems to swiftly identify and address dangers.

Recent Example of Cyber Attacks

PT Jyothi Datta (March 27, 2023)[8] has reported a recent incidents of security breaches in many companies. It is reported – "*over three weeks after being hit by an information technology (IT) security breach, drugmaker Sun Pharmaceutical Industries said its business operations have been impacted following the incident and efforts to contain and redress the situation. It also said that revenues would be reduced in some businesses as a result.*

A ransomware group has claimed responsibility for the incident, Sun Pharma disclosed to the stock exchanges, without divulging the name of the group or outlining the quantum of impact. This is the third high-profile cyber-security linked incident on a large Indian drugmaker in about three years. In late 2020, Dr. Reddy's Laboratories and Lupin reported cyber-security breaches. Last year, the All-India Institute of Medical Sciences was also hit by a ransomware attack.

While no information has been shared on the region from where the online attack was possibly launched or the precise data that may have been breached, Sun Pharma[9] said the incident's effect includes a breach of certain file systems and the theft of certain company data and personal data."

Reduced Revenue

As part of containment measures, Sun said, it had "proactively" isolated its network and initiated the recovery process. "As a result of these measures, Company's business operations have been impacted.

Consequently, revenues are expected to be reduced in some of our businesses," it added.

"The Company would incur expenses in connection with the incident and the remediation. The Company is currently unable to determine other potential adverse impacts of the incident, including but not limited to additional information security incidents, increased costs to maintain insurance coverage, the diversion of management and employee time or the possibility of litigation," Sun Pharma said.

In the loop

A media channel named ransomware group ALPHV as the alleged actor behind the attack, and threatening more damage. This has not been confirmed from any other quarter. Ransomware groups hold an organization's data for ransom, seeking a payment, for instance, to withdraw its threat and give the organization access to its own data.

Former Maharashtra Director General of Police (DGP) and former Commissioner of Police (Mumbai) told businessline, that local law enforcement authorities need to be in the loop at the earliest. Companies have to step up their defense to prevent data from being contaminated or frozen for ransom, he said, because "once a company becomes a victim, it becomes difficult for (the) cops to identify the international criminal and later

8. Reproduced from PT Jyothi Datta (2023), Security Breach Ransomware Attack: Sun Pharma says business operations impacted, The Hindu Business lines. Available at: https://www.thehindubusinessline.com/companies/ransomware-attack-sun-pharma-says-business-operations-impacted/article66667349.ece

9. Sun Pharma eyes revenue hit due to ransomware attack (March 27, 2023), The Economic Times. Available at https://economictimes.indiatimes.com/industry/healthcare/biotech/pharmaceuticals/sun-pharma-eyes-revenue-hit-due-to-ransomware-attack/articleshow/99023464.cms

follow it up with MLAT process (Mutual Legal Assistance Treaty),” which would involve the Ministry of External Affairs having to get in touch with authorities in the country from where the attack had been launched.

According to IBM Security’s annual X-Force Threat Intelligence Index report (2023), ransomware attacks persisted, despite better detection. Besides, it added, Asia saw more cyberattacks than any other region, accounting for nearly one-third of all attacks that X-Force responded to in 2022. “Manufacturing accounted for nearly half of all cases observed in Asia last year,” the report said.

Organizations operating online can benefit from AI in the following ways:

- **Detection of Threats**

  In order to find abnormalities and possible risks, AI can scan huge amounts of data, including network activity, records, and system events. AI-powered platforms are very good at spotting and stopping assaults because they can continually adapt to new risks and learn from prior ones.

- **Automation in Cybersecurity**

  Several cybersecurity jobs, including incident management, threat hunting and security screening, may be automated by AI. Businesses may use this automation to speed up reaction times, increase precision, and remove unnecessary security staff to focus on more difficult duties.

- **Statistical Analysis**

  To identify possible cyber dangers, AI may evaluate data from a variety of domains, particularly social networking sites. This makes it possible for companies to take preventive steps to stop assaults before they happen.

- **Detecting fraud**

  By examining huge databases to find abnormal behaviour patterns and abnormalities, AI may assist businesses in identifying and preventing fraud.

- **Usefulness of AI in the Current Digital World**

  It is impossible to exaggerate the importance of AI in the digital world. AI-powered technologies are becoming into crucial tools for businesses to secure their online resources as the quantity and complexity of cyber threats rise.

Some important advantages of AI in cyberspace include:

- **Better and Quick Reaction Times**

  Real-time data analysis and fast response to threats are capabilities of AI systems. As a result, organizations have more time to control the assault and limit additional harm since the reaction period is shorter.

- **Enhanced Accuracy**

  Systems using artificial intelligence (AI) can evaluate enormous volumes of data and spot possible hazards that conventional analysts would miss. This lessens the possibility of both false positives and false negatives and enhances the security monitoring precision.

- **Scalability**

  Artificial Intelligence technologies can tackle complicated tasks and expand quickly to evaluate enormous datasets. They are therefore perfect for handling the massive volumes of data generated by the internet.

- **Ongoing Development**

  Artificial Intelligence systems have the capacity to memorise from the past and constantly acclimatize to new dangers. They can thus effectively handle the continuously changing risks in cyberspace.

Concluding Remarks

AI is an effective tool for controlling cyberspace, which is ever more complicated and challenging to control. AI is capable of promptly identifying dangers and taking appropriate action because of its capacity to evaluate massive volumes of datasets in real-time and gain insight from previous experiences. AI-powered systems will become crucial tools for enterprises as cyber threats develop further.

CHALLENGES AND OPPORTUNITIES OF AI

One of the most significant technical developments of the twenty-first century has been Artificial Intelligence (AI), which has transformed the way people live, work, and connect. AI has shown that it has the ability to automate repetitive jobs, solve complicated issues, and enhance decision-making in a variety of circumstances. To ensure AI’s safe and ethical development and deployment, there are a number of issues that must be resolved, just like with any other technical advance.

Bias and Discrimination: The possibility for prejudice and discrimination is one of the biggest problems with artificial intelligence. Because AI algorithms can only be as objective as the data they are trained on, biased data will result in biased algorithms. This may result in prejudice towards people on the basis of things like colour, gender, religion, and age, among other things. If left uncontrolled, this might result in widespread prejudice and strengthen already-existing societal injustices.

Transparency: Lack of openness and ability to explain is yet another difficulty with artificial intelligence. The majority of AI algorithms are complicated, making it difficult to comprehend how they make judgments. This lack of openness may breed mistrust and uncertainty, especially when the decision made by the algorithm has major ramifications. Transparency and comprehensibility in AI systems are crucial for ensuring the ethical and safe research and application of AI.

Concerns regarding Security and Safety: Artificial Intelligence systems have the potential to have severe negative effects, especially if they break down or are compromised. This can involve causing bodily harm to people, as in the instance of manufacturing robots or driverless automobiles, or causing harm to systems, as in the case of cyberattacks. Thus, it is crucial to ensure the safety and security such technologies, especially as these systems grow increasingly embedded into our everyday lives.

Displacement of Jobs: When AI develops, it will be able to perform numerous activities in lieu of humans, which would cause redundancy and societal unrest. This can have a significantly negative impact on employees in some sectors, such the industrial sector, and worsen already existing socioeconomic imbalances.

Privacy: With AI, data collection, gathering a lot of personal information if ends up being in the possession of some unwanted person/hacker, it might be misused. Hence, protecting the security and privacy of sensitive data is essential for the ethical creation and utilization of AI.

The field of Artificial Intelligence (AI), which is quickly expanding, is changing a wide range of sectors and facets of our life. AI offers a wide range of options, and those prospects are only growing as technology develops. We will examine some of the most significant prospects that AI offer in this chapter.

Automation of Work: Automation of chores is one of AI’s most important potential benefits. Large database processing and other activities that would take humans a very long time to accomplish can be handled by AI systems. This can allow people to concentrate on harder activities that demand more innovation and judgment.

AI may streamline the examination of medical information, for instance, in the healthcare sector, freeing up professionals to devote more time with patients. Artificial Intelligence (AI) may be utilised in the industrial sector to streamline operations like quality checks, lowering the likelihood of a human inaccuracy and boosting productivity.

Personalization: The potential to customise products and offerings is yet another advantage AI offers. In order to offer personalised suggestions and insights, AI systems may examine data on consumer behaviour and preferences.

For instance, AI may be utilised in the e-commerce sector to offer clients individualised product suggestions depending on their browsing and purchasing activity. AI may be utilised in the healthcare sector to create individualised treatment regimens for individuals based on their unique traits and medical histories.

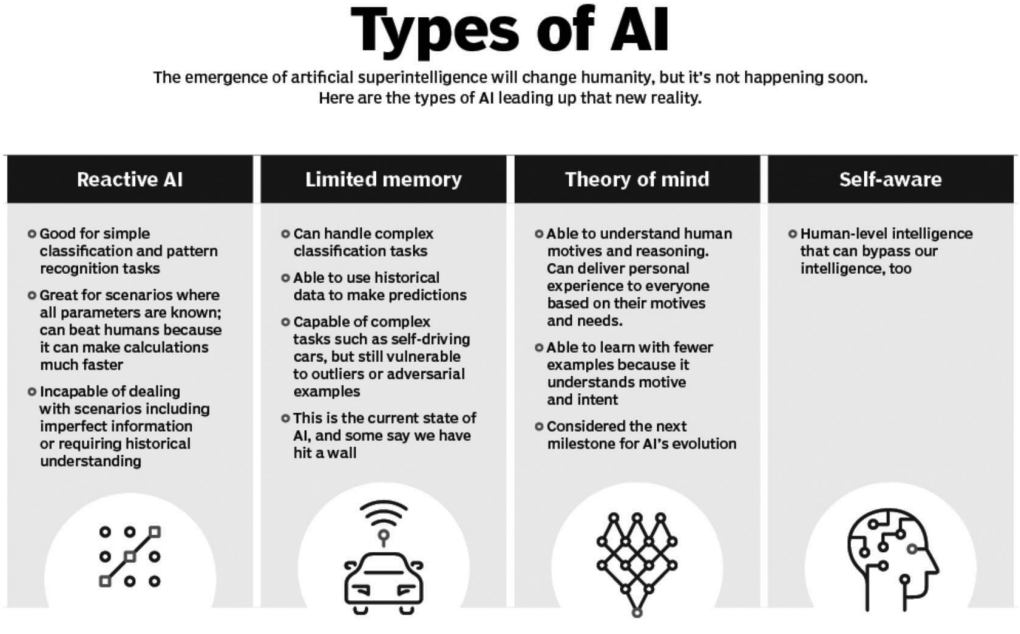
Making better decisions: AI may be applied to numerous businesses to enhance decision-making. In order to find patterns and forecast outcomes, AI systems can analyse vast volumes of data, allowing businesses and organisations to make better decisions.

AI may be utilised, for instance, in the commercial sector to assess market patterns and offer investment suggestions. AI may be used to the shipping sector to improve logistics and route optimization.

INCREASED AI INTEREST IN INDIA[10]

In India today, "Artificial Intelligence" has become the new wave, and everyone wants in. Every engineer claims some type of machine learning project on resume. The ubiquitous library management system, a software development project has now been replaced by a project to automatically recognizing handwriting.

A cottage industry of training courses in AI, machine learning, and data science has blossomed throughout the country. Most businesses have a top-down mandate to incorporate AI in their processes and product.



Source: Davit Peterson and Techtarget

10. Reproduced from Opportunities and Challenges for Artificial Intelligence in India, IT Articles, IASTOPPERS. Available at https://www.iastoppers.com/articles/opportunities-and-challenges-for-artificial-intelligence-in-india-mains-article

Although AI attention is considerably slighter in India than in China or the USA, the increased AI interest has manifested itself in the following three ways:

- Industries have started working to skill their manpower to enable themselves to compete with other global players.
- Educational institutions have started working on their curricula to include courses on machine learning and other relevant areas.
- Individuals and professionals have started acquiring these skills and are comfortable investing in upgrading their own skills.

Major Challenges

- Fundamental challenges: India has a relatively small body of researchers and research output in the field of machine learning.
- The contribution of Indian researchers to top AI conferences constitutes one-fifteenth of the U.S. contribution and one-tenth of that of China.
- India has little local expertise in the new knowledge that is being created every day by others. India do not have people who can train a new cohort of machine-learning engineers and scientists to develop and commercialize technology.
- Despite the opportunities for the present and future, Indian companies have been slow to adopt AI.
- India does not possess enough trained manpower to apply machine learning to our own problems and data, in spite of the number of standard packages available.
- Despite the initial enthusiasm for AI, there were unfulfilled potential and that the country could be doing far more to adopt and integrate AI technologies.
- The cost of failure is much higher in India than the West. This has historically meant a lack of room for innovative experimentation.
- Lack of Collaboration between Industry and Academia: The boom in the Indian IT services sector in the early 90s was partially born out of necessity – India just did not have a good "products ecosystem".
- India has historically not done well with products, there also seems to be a dearth of good talent specifically for design and user-interface functions.
- Talent will be the biggest strength for India with respect to AI. But AI is still new, so current talent in the market is very limited.
- Some challenges that the progress of AI in India faces is limited availability of manpower and of good quality and clean data, as there is no institutional mechanism to maintain high quality data.
- The country's diversity and complexity present a rich set of challenging problems for artificial intelligence.
- Current AI techniques are limited in their ability to handle complexity, and they'll have to mature to deal with the diversity of life in India.

Challenges are concentrated across common themes of:

- Lack of enabling data ecosystems.
- Low intensity of AI research (i) Core research in fundamental technologies; (ii) Transforming core research into market applications.

- Inadequate availability of AI expertise, manpower and skilling opportunities.
- High resource cost and low awareness for adopting AI in business processes.
- Unclear privacy, security and ethical regulations.
- Unattractive Intellectual Property regime to incentivize research and adoption of AI.

Opportunities

- India forms the IT backbone of the world. The country’s companies and talent are the natural contenders to add ‘intelligence’ to all the digitization.
- Investment in India can help move the whole field ahead.

Indian Services Sector

- India’s services sector (call centers, BPOs, etc. – roughly 18% of the Indian GDP) have a significant potential opportunity to cater to the coming demand for data cleaning and human-augmented AI training (data labelling, search engine training, content moderation, etc.).

Space and Defense Research

- India’s Department of Science and Technology could hire program managers to frame hypotheses around problems that could be solved using AI, and then fund research programs for these problems through grants.
- Researchers could bid for these grants in open competition by devising a variety of approaches and solutions to the research problem.
- This would help create large useful labelled data sets and the technology needed for India. Students who work on these projects will naturally go on to create startups around them.
- Government should do impact evaluation for the technologies created and select worth ones for implementation.
- India’s space and defense research organizations could enact similar programs involving the AI research community to develop solutions for them.

Policy Changes Needed

Need for legal definition of AI

- Given the importance of intention in India’s criminal law jurisprudence, it is essential to establish the legal personality of AI (which means AI will have a bundle of rights and obligations).
- To answer the question on liability, a strict liability scheme that holds the producer or manufacturer of the product liable for harm, regardless of the fault, might be an approach to consider.
- Since privacy is a fundamental right, certain rules to regulate the usage of data possessed by an AI entity should be framed as part of the Personal Data Protection laws in India.

Data Protection Law

- A data protection law is needed which aims to give more security to consumers of technology.
- Law provides for the processing of personal data, including digital media, by either a natural person or a public or private legal entity, for the purpose of protecting a person’s fundamental rights of freedom, privacy, and free development of personality.

Trade Negotiations

- Trade and Development agreement to work together to harness the power of cutting-edge technologies such as AI and blockchain to enhance and improve trade.
- With the growing complexity of international trade agreements, the purpose of the use of AI is to reduce such complexity and help representatives of less favored nations achieve better results.

Fraud Detection

- The idea is to develop a system to help customs officers identify suspicious customs operations, and to develop a product and foreign exporter information system to help importers in the registration and classification of their products and corresponding exporters.

Criminal Investigation

- The investment is geared towards data science and AI to collect, store, and analyze large volumes of information.
- The system allows information from different sources and bodies to be collected and also allows a series of real-time data to be collected from suspected criminals.

Way Forward

- As with any major advancement in technology, it brings with it a spectrum of opportunities as well as challenges. On one hand, several applications have been developed or under development with potential to improve the quality of life significantly.
- Artificial Intelligence (AI) is likely to transform the way we live and work. Due to its high potential, its adoption is being treated as the fourth industrial revolution.

Concluding Remarks

Currently, most of the traction in India is in the form of AI pilot projects from the government in agriculture and healthcare, and the emergence of AI startups in cities like Bangalore and Hyderabad. Though these are indications of grassroots level AI adoption, the pace of innovation isn't comparable to the USA or China today.

AI AND CYBER SECURITY[11]

In this age, cyber security has grown to be a big challenge. Database breach, identity theft, captcha cracking and various issues frequently harm countless individuals as well as corporations. Devising the proper rules and methodologies and putting them into practice with exacting accuracy to combat cyberattacks and cybercrimes remains an on-going challenge. Recent advances in artificial intelligence have significantly increased the danger of such attacks along with other activities. It has been used in practically all branches of science and research. AI has sparked a transformation in fields ranging from robotics to healthcare.

By incorporating AI into cyberspace, the potentially evolving cyber security threat that faces multinational corporations could be minimized. As processing power, storage capacities and database collecting expand, machine learning and artificial intelligence are integrated more broadly across sectors than at any other time recently. Humans can't process this much information in a sequential manner. Using machine learning and AI, this data surge might be reduced in a short amount of time, assisting the organization in recognizing and addressing the security concern.

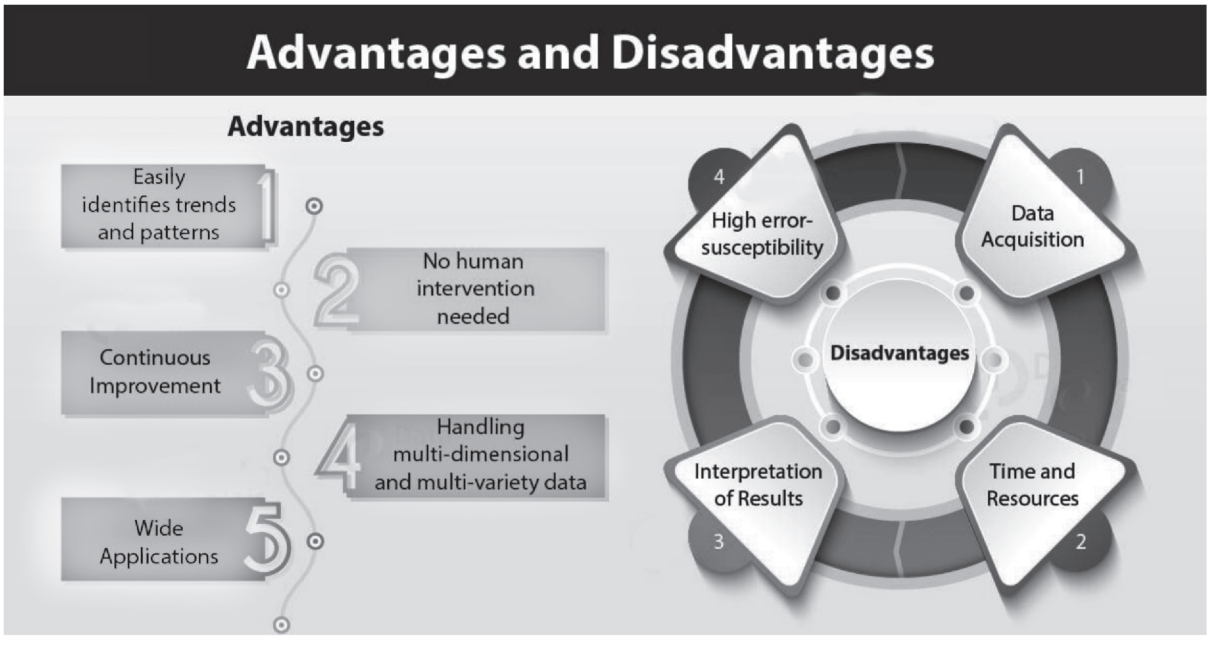
11. See, Fay Robert and Trenholm Wallace, The Cyber Security Battlefield, CIGI Online. Available at https://www.cigionline.org/articles/cyber-security-battlefield/?utm_source=google_ads&utm_medium=grant&gclid=EAIaIQobChMIwb2dyoXU_gIVUGErCh1UrgJFEAAYAyAAEgKmmfD_BwE

Emergence of AI in Cyber Security:

Owing to its recognizing capabilities, data collection, and other capabilities, machine learning and Artificial Intelligence are being integrated more deeply than ever before across organisations and apps. This vast collection of data is valuable food for AI, which can analyze every gathered information to identify unique patterns and intricate characteristics. This means that in terms of cyber security, new initiatives and flaws may be quickly identified and studied to help avoid more attacks. It may lessen some of the burden placed on human cybersecurity partners. When a task is necessary, they are notified, but they also have the option of devoting their time to more creative and fruitful tasks.

Use of AI in Cyber Security:

Artificial Intelligence is already being adopted in numerous fields of cyber safety or is currently being considered in these areas. For example, Gmail uses artificial intelligence to detect unwanted spam and malicious mails and blocks them by using AI tools. Whenever any user clicks any email message or marks it to be safe, they are basically helping to educate the AI to distinguish spam and safe mails in the future. Due to these advancements, AI is now capable of detecting even the subtlest spams that try to pass as normal regular mails.



Source: https://data-flair.com

Benefits of AI in Cyber Security

- **Threat Assessment:** Threats are identified using conventional security techniques like signatures. This method may work well for risks that have already been encountered, but it is ineffective for hazards that haven't yet been discovered. Around ninety per cent of attacks may be distinguished using signature technique. AI can boost recognition percentages up to ninety-five, but one will experience a huge data of "false-positives" if someone replaces traditional techniques with it. The optimal method integrates traditional methods with AI. It could increase the location rate up to hundred per cent and reduce false positives. By combining some behaviour assessment techniques, institutions can additionally employ AI to enhance the risk-chasing approach.

- **Improvements in Threat Detection:** Significantly better detection systems rates could well be obtained by combining conventional security mechanisms (i.e. utilising the database of all recorded security concerns till date) and employing automation to identify new risks.
- **Detecting Frauds:** Fraudulent purchases and actions may be recognised and stopped in a timely manner by seeing patterns and identifying breaches from the expected baseline behaviour. "Anomaly detection" is one of the most well-known uses of machine learning since it is a commonly used technique.
- **Detecting Malwares:** In most cases, hackers deliberately design malwares, which once made, automates the creation of successive version that evade detection. Machine learning techniques are used to improve traditional signature-based malware identification algorithms in order to identify and stop the transmission of certain possible malware copies and variations.
- **Protection of Passwords:** Passwords have long been one of the privacy concerns of organizations. In fact, passwords are usually the primary connection involving our identities and the conduct of online fraudsters. Although biometric authentication has been considered a viable answer, it's not currently the easiest practical answer to apply in this case. With the use of AI, it might change over a period of time. Developers are implementing AI to strengthen authentication process and get rid of any flaws. A good illustration of this is Apple's face identification software. This technique, called 'Face ID', uses infrared sensors that detect a user's facial characteristics. The Apple AI algorithm then develops a complex representation of the user's face to aid in the identification of significant resemblance.
- **Secure Network Automation:** The creation of security policies and organizational network structure are two fundamental elements of cybersecurity. Admittedly, these demand a great deal of effort and attention from people to attain and manage.

Thankfully, AI can partially simplify these processes. By monitoring network activity trends, AI may produce and advice rules and processes that are tailored to one's specific environment.

Disadvantages of AI in Cyber Security

- **Cost Efficiency:** Usually, the expense of deploying AI services is too high, making it impossible for everybody to benefit from them.
- **Online Threats:** Nowadays, hackers have too much access to our data and safety. If precautions are still not followed, they may simply monitor our whereabouts and hack our individual data anytime.
- **Humans are being controlled by machines:** Humans are being controlled by machines and this was the first concerns of using AI. This issue has previously been discussed in several novels and movies. It is necessary to take action to stop this from happening.
- **Cybercriminals are aware of the public access to AI knowledge:** Cybercriminals may easily obtain cybersecurity products developed by AI and utilise these to attack users through malware. Hackers have the ability to develop harmful, AI-resistant programs that more effectively penetrate sites and businesses.
- **Job Losses:** AI is regarded as a danger since some estimates indicate that a significant portion of the workforce in any organisation over a period of time will be replaced by AI apps and machines. Many people do not want to learn or understand new technologies, which in turn leads to the decrease in workforce.
- **Evolving Cyberthreats:** Even by incorporating AI into the business doesn't guarantee that one will instantly become immune to all threats. Even AI systems need ongoing redesign, improvement and maintenance since viruses and malware are always evolving.

Concluding Remark

It is impossible to overlook the need for advanced cyber security measures in a situation where malicious cyber threats are growing exponentially. The significance of AI in cyber security, as well as the many problems that occur from it and how to mitigate them has its own pros and cons. Despite the limitations, AI still plays a big part in cyber security. Artificial intelligence over time will help to develop data protection by helping to overcome the shortcomings.

AI VERSUS ETHICS & MORALITY

The significance of Artificial Intelligence (AI) has increased significantly during the past few decades. Self-driving vehicles, chatbots, speech assistants and many other technologies have revolutionised the way we live our lives as a result of AI technology. The importance of moral foundations and ethical issues has increased as AI becomes more pervasive. The growth of artificial intelligence poses moral questions about matters like bias, responsibility, justice, and openness. More advanced and effective AI systems have been developed due to the developments in machine learning and other fields and so the importance of artificial intelligence (AI) has grown in this century. Besides this, as the AI has developed, significant moral and ethical issues are also being raised. The effects of Artificial intelligence on ethics and morality are covered here.

Confidentiality

Concerns regarding confidentiality/privacy are quite substantial in regard to AI. Massive quantities of private information, including surfing histories and shopping patterns, are collected about people by AI systems. Predictive models and tailored marketing campaigns may be created using this data. Moreover, it may be used to determine a person’s eligibility for jobs, insurance, and loan prospects. A serious breach of privacy may result from the improper application of this dataset.

AI’s Prejudice

The data that AI is fed determines how objective it really is. As statistical information is the basis for training AI models, biased statistical information will result in biased AI models. Policies may be taken as a consequence that is unfair and arbitrary. For instance, if the learning data comprises primarily of white people, an AI system utilised in recruiting may be prejudiced towards people of colour. Consequently, if the testing dataset comprises disproportionate detention and acquittals of members of minority populations, an AI system utilised in criminology may be prejudiced against them.

Responsibility and Transparency

It might be challenging to comprehend how AI technologies make judgments since they are frequently “black boxes.” Due to the difficulty of holding an Artificial Intelligence’s algorithm accountable for its actions, the absence of openness may also result in lack of responsibility. It could be difficult to comprehend the rationale behind a suggestion given by an AI system utilized in healthcare, for instance. Due to the absence of openness, it may be impossible to contest the choice or consider the program responsible for any unfavourable results.

Discrimination and Bias

AI systems are susceptible to prejudice and bias, which might have detrimental effects on specific human beings or communities. For instance, a recruiting prejudice may occur if an AI system used to filter job candidates favours women or minorities. According to this, a criminal justice AI system might be unfavourable to minorities, resulting in unfair prosecutions.

Regardless of whether AI’s algorithms can be trained to be ethical or moral is among the fundamental questions

regarding Artificial Intelligence and ethics. Some studies contend that it is feasible to build AI systems to act morally and ethically, whereas others counter that it is not possible to build fully moral or ethical Artificial intelligence technology.

It may prove challenging to encode moral and ethical ideas into algorithms or principles that AI technologies can adhere to since they might be complicated and context-dependent. For instance, the ethical precept of "do no damage" is vital in many disciplines, yet defining meaning of damage means in a specific situation might be complex.

Another difficulty is that ethical and moral concepts sometimes include irrational judgments that are hard to define or assess. Considering everyone equally may well be required under the idea of justice, however fairness can be a subjective concept that varies based on the situation.

Notwithstanding these obstacles, attempts are being made to create ethical and moral guidelines for Artificial Intelligence. For instance, a set of standards for the moral development and design of Artificial intelligence systems has been created by the "IEEE Global Initiative for Ethical Issues" in AI and Autonomous Systems. Similar to this, a group of business, academics, and philanthropic group has created a set of ethical guidelines for Artificial Intelligence.

The ethical and moral ramifications of AI continue to raise problems, despite the existence of these models. One worry is the possibility that prejudices and inequities might be reinforced or even made worse by AI technologies.

AI VERSUS LAW AND COMPLIANCE

In India, numerous industries have seen significant advancements in artificial intelligence (AI). Despite the prospective advantages it may provide, AI deployment in the legal sector has been somewhat gradual. In this chapter, we'll look at some of the applications of AI in the Indian legal sector and the difficulties that come with them, notably in terms of complying with legal requirements.

AI's in the Legal Industry

In the domain of law and compliance, AI has the capacity to revolutionize the legal sector. AI can help lawyers and legal departments deal with the volume of data produced as well as the increasing complication of rules and guidelines. Artificial intelligence (AI) may, for example, simplify the contract monitoring, compliance, and assessment processes.

By combing through voluminous data to find pertinent cases as well as precedents, AI may also help attorneys with their research work. This may save professionals a great deal of time and free them up to work on other legal compliances.

AI-powered solutions may also classify and analyse data to find possible regulatory or legal concerns, assisting organizations in adhering to rules and averting expensive legal fights.

Although, AI can simplify repetitive operations and improve the productivity and efficiency of attorneys, some legal duties still demand human involvement. For example, complicated legal disputes or discussions call for human knowledge, wisdom and competence.

Challenges in AI adoption in Law and Compliance

Notwithstanding the potential advantages of AI in law and compliance, India faces a number of barriers to its implementation. Lack of knowledge and trustworthiness is one of the major problems. Many law companies and attorneys are still unaware of the potential benefits of AI for the legal industry.

The expense of deployment is another issue because it necessitates using specialist technologies and high-quality datasets. Smaller legal companies may find it difficult to employ AI solutions due to the high expense.

Another important problem is privacy issues. Information protection and privacy are issues that are raised with the introduction of AI systems that utilise personal information. When utilising AI systems that gather and handle personal data, lawyers and legal departments must exercise caution.

The regulatory framework presents another obstacle to AI use in law and compliance in India. There isn't a specific legislative mechanism that covers the implementation of AI in the legal sector, and India's data security regulations are still in the process of development. Due to this, it is challenging for legal firms to embrace and use AI technology.

Conclusion

In India, the legal sector is poised to undergo a transformation, especially in the areas of compliance and legislation. Yet, there are considerable obstacles to its acceptance, including a lack of knowledge and confidence, high adoption costs, security issues as well as the regulatory compliance. Thus, it is crucial that Indian law companies and legal departments spend the time learning about the competence of AI and the prospective advantages it brings to the legal field. Law businesses and legal teams may save time, cut expenses, and do better work by investing in AI solutions.

AI AND INTELLECTUAL PROPERTY RIGHTS

Introduction of Artificial Intelligence and its use has considerably changed the arrangement of how people work. Similarly, its use in intellectual property has become increasingly prevalent. One of the most important applications of AI in IP is the creation of new work as it can generate original work. AI focuses on performing tasks with the help of intelligence methods such as Reasoning, Machine Learning, Problem Solving, Perception, and Linguistic Intelligence. With the help of AI-powered algorithms, comprehensive searches of existing IP databases can be performed more efficiently and accurately. Along with this, it also helps in analyzing technical information and documents to determine existing relevant work to prevent copyright infringement. As AI technology becomes more advanced, it will likely be used more in areas related to intellectual property. This could lead to new legal issues and problems.[12]

> "As artificial intelligence (AI) continues to emerge as a general-purpose technology with widespread applications throughout the economy and society, this poses fundamental questions that sit at the heart of the existing IP systems. Some major questions involve – (i) Does AI innovation and creation need IP incentives? (ii) How should the value of human invention and creation be balanced against AI innovation and creation? (iii) Does the advent of AI require any changes to the existing IP frameworks?" - **World Intellectual Property Organization**

Some of the IPR issues related to AI generated output are as follows:

1. **Ownership and Authorship**

   One of the most important legal challenges posed by Artificial Intelligence on IP is the issue of ownership and authorship of AI-generated works. As discussed earlier, one can generate original work with a high level of creativity with the help of AI but the question arises 'Who owns that work?' one who gives directions to the AI system to create the work (User), the developer of the AI system, or the AI system itself. According to the traditional intellectual property law, the creator or author of the work is considered the sole owner of the work but this is not the case with the AI-generated art.

2. **Copyright Challenges**

   The ability of Artificial Intelligence to generate huge content quickly raises copyright issues as it can easily duplicate and reproduce copyrighted content such as images, texts, videos, music, etc. AI-

12. Reproduced from Impact of AI on Intellectual Property Practices (January 31, 2024), Free Law.

powered systems can copy any work or art or content without permission of the owner, making it difficult to identify the original and duplicate or unauthorized work. Now, the question arises whether the content generated through AI can be copyrighted. In most jurisdictions including Spain and Germany, it has been determined that only works created by a human being can be protected by copyright.

A key question regarding AI copyright in India is whether computer-authored works meet the originality criterion under Section 13 of the Copyright Act[13]. Courts have interpreted originality as intellectual effort furnished by humans. But training neural networks involves significant human endeavour in curating datasets, designing architectures, etc. Developers argue this effort imbues originality into works like AI-generated music.[14] Similarly, in the M/S Kibow case, the Delhi High Court ruled that AI systems cannot be officially registered as the proprietor of a trademark. It also highlighted that the Trade Marks Act, of 1999 illustrates that only a human being can apply for and be officially registered as the proprietor of a trademark.

Amending the law to designate AI developers as owners could incentivize building socially useful AI assistants and content generators. However, some caution this may create monopolies over data used to train models.[15] Nuanced provisions may be needed to balance interests, like compulsory licensing of protected AI works. Infusing human intent into generative processes can also strengthen copyright claims. India's jurisprudence around AI copyright will likely evolve case-by-case.

However, others contend processing data alone may not satisfy originality – focus should be on the creative process itself.[16] Especially with advanced AI like Generative Adversarial Networks, outputs manifest autonomously with little human input during generation. Even if AI works get copyright, determining the rightsholder is difficult – the programmer, user, or AI system itself? Overall, more clarity is required on copyright's applicability to AI works in India.

3. Patent Law

India's patent regime faces similar quandaries around AI. Under Section 2(1) of the Patents Act[17], AI developed inventions like new chemicals or devices may meet patentability criteria of novelty, utility and industrial applicability. However, such works may not demonstrate sufficient inventive step since the AI system rather than a human brain conceived the invention16. This could preclude patentability.

Again, developers try asserting their efforts training the model should count[17]. But others argue the critical inventive aspect under law is conceiving the final patented product or process, which AI does autonomously.[18] Section 6's terminology of identifying a human "true and first inventor" also suggests difficulty accommodating AI inventors.[19] Like copyright, approaches are debated like designating the programmer or user as deemed inventor for AI creations.

Clearer guidelines are required on evaluating and assigning patents for AI outputs. Suitably defining inventiveness for AI systems, while upholding patent law's intent of protecting true human inventors, will be key. India could emulate US and UK patent office moves to allow naming AI systems alongside humans as joint applicants on patents they contributed to overall, India's patent law will require modernizing to appropriately incentivize AI innovation.

13. The Copyright Act, 1957, §13, No. 14, Acts of Parliament, 1957 (India)

14. Ramakrishna B & Anil Kumar H.S., Fundamentals of Intellectual Property Rights: For Students, Industrialist and Patent Lawyers (2017)

15. Ibid

16. Guadamuz, A. (2021). Do androids dream of electric copyright? Comparative analysis of originality in artificial intelligence generated works. Intellectual Property Quarterly, (2), 169-186

17. The Patents Act, 1970, §2(1), No. 39, Acts of Parliament, 1970 (India)

18. Yanisky-Ravid, S., & Liu, X. (2018). When artificial intelligence systems produce inventions: An alternative model for patent law at the 3A era. Mich. St. L. Rev., 2018, 839

19. The Patents Act, 1970, §6, No. 39, Acts of Parliament, 1970 (India)

4. Other IPR Issues

Automated content generation, data privacy and security, deep fakes, and manipulated content are some other issues posed by AI in safeguarding intellectual rights. Moreover, the use of AI increases various ethical concerns; therefore, there is a need to balance the benefits of AI with the protection of intellectual property rights by introducing appropriate frameworks.

Requirement of Amendment in Laws

Due to the emergence of AI, below are some of the sections that may require changes in the IPR related laws[20] :

- **Copyright:** AI-generated works may raise questions about authorship and ownership. Section 17 of the Copyright Act may need to be amended to address the issue of ownership of AI-generated works.
- **Patents:** AI technology can generate novel inventions that may require patent protection. Section 3(k) of the Patents Act may need to be reviewed to address the patentability of AI-generated inventions.
- **Trademarks:** AI systems can generate trademarks, which raises questions about the ownership and distinctiveness of such marks. Sections 9 and 11 of the Trademarks Act may require amendments to address these issues.
- **Trade secrets:** AI technology can facilitate the disclosure and misappropriation of trade secrets. Section 2(1)(a) of the Trade Secrets Act may need to be amended to clarify what constitutes a trade secret in the context of AI.
- **Enforcement:** The use of AI can make it difficult to detect and enforce IPR violations. Section 53 of the IPR Act may need to be amended to address these challenges and to ensure that appropriate enforcement mechanisms are in place.

Existing IPR regime well-equipped to protect AI generated works, no need to create separate category of rights[21]: Recent Statement of Union Minister of State for Commerce and Industry, Government of India in a written reply in the Rajya Sabha on 9th February, 2024.

Intellectual Property Rights including Copyright and Related rights provide exclusive rights to the right owner who are legal persons for a set duration. These rights allow for the work or creation or innovation to be protected and enables collection of royalties through licensing. For a right to be granted, the owner is required to meet the criteria specified under the law. India being a member of all major international conventions and agreements for the protection of Intellectual Property Rights grants adequate protection of rights for works created by legal persons through Copyright Law and protects inventions through the Patent system. Therefore, there is no requirement to create a separate category of rights for AI and related innovations in the Indian IPR Regime. Therefore, while Artificial Intelligence (AI) and related innovations is an evolving stream of technology the current legal framework under the Patent and Copyright Act is well-equipped to protect Artificial Intelligence generated works and related innovations. Presently, there is no proposal to create any separate right so ram end the law in the context of AI-generated content.

The exclusive economic rights of a copyright owner such as the right of reproduction, translation, adaptation etc. granted by the Copyright Act, 1957 obligates the user of Generative AI to obtain permission to use their works for commercial purposes if such use is not covered under the fair dealing exceptions provided under Section 52 of the Copyright Act. Since Intellectual property rights are private rights, these are enforced by the individual rights holders. Adequate and effective civil measures and criminal remedies are prescribed under the Copyright Law against any act of infringement or unauthorized use of works, including digital circumvention.

20. Reproduced from Vishaka Aditya, Navigating the Legal Challenges posed by AI on Intellectual Property, Legal Service India

21. This information has been provided by the Union Minister of State for Commerce and Industry, Shri. Som Parkash in a written reply in the Rajya Sabha on 9th February, 2024. Reproduced from Press information Bureau. Available at https://pib.gov.in/PressReleasePage.aspx?PRID=2004715

CASE LAWS

Recent Indian case laws related to ai and intellectual property:

AI technology has had an impact on landmark judgments passed by the courts in India.

These case laws demonstrate the need for clarity and amendments in Indian intellectual property laws to address the emerging challenges posed by AI technology. The Indian judiciary has taken a pragmatic approach in these cases by balancing the need for innovation with the protection of intellectual property rights.

These case laws demonstrate the evolving nature of the relationship between AI and intellectual property in the Indian legal system and highlight the need for clear legal frameworks to address the legal challenges posed by AI on intellectual property.

In 2021, the Delhi High Court ruled in the case of M/S Kibow Biotech v. M/S The Registrar of Trade Marks that an AI system cannot be considered a proprietor of a trademark. The court held that under the Trade Marks Act, of 1999, only a person can apply for and be registered as the proprietor of a trademark, and an AI system cannot be considered a person for the purposes of the Act.

In another case, Ferid Allani v. Union of India, the Delhi High Court examined the issue of whether an AI-generated work can be copyrighted in India. The court held that copyright protection can be granted to AI-generated works if they meet the criteria for originality and authorship under the Copyright Act, of 1957. The court also held that the authorship of an AI-generated work should be attributed to the person who decided to create the work, such as the programmer or user of the AI system.

In the case of South Asia FM Limited v. Union of India, the Delhi High Court examined the issue of whether a song created by an AI system could be considered a work of original authorship under the Copyright Act, of 1957. The court held that the song was not eligible for copyright protection as it lacked the human element of creativity and was the result of an algorithmic process. The court held that for a work to be eligible for copyright protection, it must result from human creativity and originality.

In the case of Gaurav Bhatia v. Union of India, the Delhi High Court held that AI-generated inventions could be patented if they met the requirements of novelty, non-obviousness, and industrial applicability under the Patents Act.

In the case of Nippon Steel Corporation v. Union of India, the Bombay High Court held that computer programs that generate inventions or discoveries could not be patented because they are not capable of being invented by a person.

In the case of In Re: Sugen Life Sciences Pvt. Ltd, the Indian Patent Office rejected a patent application for a drug discovery algorithm, stating that it was not a patentable invention under Section 3(k) of the Patents Act because it was a computer program per se.

In the case of Dr. Alaka Sharma v. Union of India, the Delhi High Court held that an AI-generated portrait could not be registered as a trademark under the Trademarks Act because it did not satisfy the distinctiveness requirement.

In the case of MySpace Inc. v. Super Cassettes Industries Ltd., the Delhi High Court held that an AI-based algorithm used to identify and remove infringing content on a social media platform did not violate the Copyright Act because it was not reproducing the copyrighted content.

STEPS OF GOVERNMENT OF INDIA ON ARTIFICIAL INTELLIGENCE: A SNAP SHOT[22]

As per the information given by the Minister of State for Electronics & Information Technology, in a written reply to a question in Lok Sabha on Government of India has taken several steps to promote upskilling or reskilling in the field of Artificial Intelligence which include the following: -

Ministry of Electronics and IT (MeitY) has initiated a programme titled FutureSkills PRIME (www.futureskillsprime.in) in collaboration with NASSCOM, a B2C framework for re-skilling/ up-skilling of IT professionals in 10 Emerging are as including Artificial Intelligence. So far, 7 Lakh candidates have signed-up on the FutureSkills PRIME Portal, out of which, 1.2 lakh candidates have completed their courses. In addition, 524 Trainers and 4292 Government Officials have been trained on these technologies by NIELIT/C-DAC Resource Centres, and around 1.3 lakh unique learners have collectively earned 8.9 lakh 'badges' in recognition of having completed bite-sized digital fluency content. Under Artificial Intelligence, 36,528 candidates are enrolled in deep – skilling courses and 47,744 candidates are enrolled in Foundation courses.

Government has published the National Strategy for Artificial Intelligence in June 2018 and proposes to develop an ecosystem for the research and adoption of Artificial Intelligence i.e. #AIFOR ALL.

Government has launched 'National AI Portal' *(https://indiaai.gov.in/)* which is a repository of Artificial Intelligence (AI) based initiatives in the country at a single place. As on date, there are 1024 national and international articles, 655 news, 200 videos, 90 research reports, 279 Startups, 120 Government initiatives listed at National AI Portal.

In addition, various steps have been taken to promote capacity building in Artificial Intelligence which include the following:

Government has initiated 'Visvesvaraya PhD Scheme' with an objective to enhance the number of PhDs in Electronics System Design & Manufacturing (ESDM) and IT/IT Enabled Services (IT/ITES) sectors in the country. The research areas under the scheme include Artificial Intelligence (covering 82 PhD fellows) and Machine Learning (covering 59 PhD fellows).

National Programme on Responsible Use of AI for Youth: With the objective to empower the youth to become AI ready and help reduce the skill gap, government along with Industry partner has started this initiative to promote AI awareness among Government school going children. In Phase I, 50,666 students and 2536 teachers from 2252 schools from 35 States and UTs attended orientation sessions on AI. In Phase II, 100 teams have been short listed and have undergone extensive mentoring by AI experts. In Phase-III, Top 20 students have demonstrated their solutions in the national conference.

To foster innovation through research, government has created several 'Centres of Excellence' on various Emerging Technologies including Artificial Intelligence. These centres connect various entities such as startups, enterprises, venture capitalists, government and academia to look into problem statements and develop innovative solutions.

Department of Science & Technology is implementing the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) to promote R&D, Human Resource Development (HRD), Technology Development, Entrepreneurship Development, International Collaboration etc. As part of the Mission implementation, 25 Technology Innovation Hubs (this) have been established in reputed institutes across the country in advanced technologies including Machine Learning and Artificial Intelligence.

Government of India has also joined the league of leading economies including USA, UK, EU, Australia, Canada, France, Germany, Italy, Japan, Mexico, New Zealand, Republic of Korea, Singapore as a founding member of

22. Reproduced from Artificial Intelligence, published by Press Information Bureau of India. Available at https://www.pib.gov.in/PressReleasePage.aspx?PRID=1811372

the Global Partnership on Artificial Intelligence (GPAI), which is an international and multi-stakeholder initiative to guide the responsible development and use of AI, grounded in human rights, inclusion, diversity, innovation, and economic growth.

Government of India organized Responsible AI for Social Empowerment (RAISE) in 2020, a first-of-its-kind global meeting of minds on Artificial Intelligence to drive India’s vision and roadmap for social transformation, inclusion and empowerment through responsible AI. It was attended by 79,000+ stakeholders from academia, research, industry and government representatives from 147 participating countries.320 distinguished speakers from 21 countries participated in the event.

The initiatives mentioned above are focusing on digital enablement of citizens in the field of Artificial Intelligence including those belonging to the Tier 2 & Tier 3 cities. Further, the Future Skills PRIME programme follows an ‘aggregator of aggregators’ approach for digital skills training on a national scale and is hosted as an online B2Ce-commerce platform, thereby also enabling citizens in Tier 2 & Tier 3 cities to participate in the programme. To further strengthen the physical and digital connectivity, 40 C-DAC/NIELIT Centres spread across the country are also institutionalizing blended-learning programmes, in a hub and spoke mode, as Lead & Co-Lead Resource Centres.

Further, the Future Skills PRIME programme targets to re-skill/ up-skill aspirants in emerging technologies so that they stay relevant in their present job with improved prospects, besides finding new avenues in future job-roles. The programme also targets those whose may have lost their existing jobs due to disruptive and emerging technologies. Towards this, the programme takes into account employment linkages, such as a ‘Career Prime’ web-page on the platform and an integrated ‘Career Portal’, which provides information on IT-ITeS jobs, internships, apprenticeships, hackathons etc.

Under Future Skills PRIME, incentives are available to the trainees, including those from economically weaker backgrounds, after the learner is successfully assessed and certified. The incentive mechanism is aimed at motivating the learner to successfully complete the online up- skilling/re-skilling programs.

CASE STUDIES

The society we are living in today is being drastically changed by artificial intelligence (AI). It has transformed a number of sectors, including production, medical, academics, and finance, to mention some. Several businesses have actively adopted AI-powered techniques to enhance their processes, and plenty more are thinking about doing the same.

In the drive to deploy AI and take leverage of its benefits, India is catching up quickly. Companies all over India are examining AI-enabled technologies to drive growth, simplify processes, and enhance client satisfaction. To guarantee that AI is utilised ethically and appropriately, laws and regulations must be implemented as new technology brings new challenges post its adoption.

India has encountered several cases that address the legal ramifications over this decade itself. Several of these judgments have established significant precedents that can direct corporations and lawmakers in how they view and perceive AI.

The Supreme Court of India achieved a huge technical advancement during March 2023 by using AI to live-transcribe its proceedings/hearings. Despite this, courts throughout the nation have not used text-generating bots or algorithms to make rulings or support conclusions up to this point.

The High Court of Punjab and Haryana in the last week of March 2023 has made legal history by integrating human and artificial intelligence in its ruling in a case concerning assault and murder. HMJ Anoop Chitkara used the ChatGPT AI tech’s response in the ruling while he was addressing the issue of jurisprudence of bail in a case where assault and cruelty are the main ingredients. This in itself will set a good precedent for the courts in the future.

Right to Privacy (Aadhaar Case)

One of the notable instances involving AI in our country was the Aadhaar case. In this case, the Apex Court had to establish whether the Aadhaar database infringed on Indian residents right to privacy.

The biometric authentication Aadhaar employs artificial intelligence to collect the confidential information of Indian people. Since its inception, the program has generated controversy, and various data protection activists have attacked it for gathering excessive amounts of personal data.

The Aadhaar system was found to be lawful by the Constitutional Bench in the year 2018, however some limitations were placed on its application. The judgment said that people should have the option of opting out of the programme and that Aadhaar cannot be made compulsory for operations like banking and cellphone communications.

Organisations who employ AI to gather and preserve customer information should take note of the Aadhar issue. The case emphasises the need of protecting personal data and preventing the misuse of AI systems to violate people's right to privacy.

Shamnad Basheer* vs. *Union of India

In the case of Shamnad Basheer vs. Union of India, the Delhi High Court had issued an order in 2020 requiring the authorities to be fairly transparent regarding the implementation of AI in decision making procedures. The court determined that the application of Artificial Intelligence must be open and responsible in the matters involving the National Law School of India University's (NLSIU) usage of Artificial Intelligence to evaluate candidates for admission.

The Gig Economy Case

During the last few decades, India's gig economy has expanded substantially, with industry leaders like Uber and Ola leading the market. In 2018, a lawsuit was brought against all these businesses before the Supreme Court, requiring it to determine whether gig workers should be classified as autonomous contractors or workers.

The court determined that gig workers, who already have authority over their jobs and the freedom to select the time and place they operate, must be regarded as independent contractors rather than workers.

For companies that employ AI-powered systems to hire autonomous workers, the gig economy argument is important. The situation emphasises how crucial it is to comprehend the legal ramifications of the gig economy and make sure that employees have the freedoms and safeguards they need.

The Facial Recognition Case

2019 saw a facial-recognition software case heard by the Delhi High Court. A person filed the lawsuit, claiming that the Delhi police had breached his right to privacy by using facial-recognition software.

The court decided that the implementation of face recognition software by the Delhi police was not an invasion of confidentiality, as long as it was carried out with sufficient precautions. The Delhi police was instructed by the HC to take steps to guarantee that the software is only used for positive purpose and that any information gathered is not exploited.

For companies that employ technology to recognize faces driven by AI, this particular case is important. The case underlines the necessity of verifying that such technologies are utilised responsibly and professionally, with sufficient protections in place to protect personal data.

Other Developments

One significant breakthrough was the establishment of the "Committee on Artificial Intelligence (AI) for Economic Transformation" by the Government of India in August, 2017. Then in June, 2018, the group, which was entrusted with creating a framework for the usages of Artificial Intelligence in India, published its findings.

The National Plan for Artificial Intelligence, which was unveiled by the Indian Government in 2018, also provides an extensive roadmap for the advancement of AI in our country, including investments in R&D, educational and manpower development and regulatory guidelines.

Given the possible hazards involved with Artificial Intelligence systems that manage personal datasets, there have also been conversations in India about the requirement for Intelligence specific laws and regulations to safeguard information. Unfortunately, no explicit law has been approved on this subject as of now.

Nevertheless, there have been a number of significant advancements and conversations regarding the management of AI and its possible implications for society, despite the fact that there haven't been enough particular AI-related precedents in our country.

Conclusion

The aforementioned Indian AI precedents demonstrate the necessity for corporations and governments to comprehend the legal repercussions of AI. Organizations utilizing AI-powered services must make sure the independent workers/contractors are provided the freedoms and safeguards they deserve, whereas organizations that use AI to gather and keep individual information must ensure that they preserve personal individual privacy. Also, businesses must make sure that face recognition software as well as other AI-powered technologies are utilised morally, sensibly and with appropriate privacy protections.

LESSON ROUND-UP

- Artificial Intelligence (AI) describes the creation of smart computers that can carry out activities that traditionally call for human intelligence.
- Artificial Intelligence (AI) programmes that interact with people and carry out tasks include chatbots and virtual assistants.
- Customer service, healthcare, and education are just a few applications for chatbots and virtual assistants. Chatbots and virtual assistants enabled by AI can have advantages including higher productivity, increased customer happiness, and lower expenses.
- AI has important ramifications for cybersecurity and cyberspace. Data breaches and other cyberattacks are less likely when AI is used to quickly identify and respond to cyberthreats.
- Automation of basic cybersecurity chores with AI can free up human specialists to concentrate on more difficult problems.
- Cybercriminals may also utilise AI to develop more complex and focused assaults, so it's critical for businesses to have robust cybersecurity safeguards in place.
- AI offers society both advantages and disadvantages. Possibilities include boosted productivity, better judgment, and fresh inventions.
- Difficulties include the loss of jobs, ethical issues, and prejudice in AI systems. When addressing these issues, it's crucial to take use of AI's potential.

- AI development and application must take ethics into account. Algorithm bias, a lack of transparency, and the potential for AI to be misused negatively are a few examples of ethical problems.
- During the AI development process, including data collecting, algorithm creation, and deployment, organizations should give ethical issues top priority.
- Although the legal environment surrounding AI is still developing, rules and regulations that affect AI development and deployment are currently in existence. Examples include legislation governing data privacy, consumer protection, and employment.
- One of the most important applications of AI in IP is the creation of new work as it can generate original work.
- AI focuses on performing tasks with the help of intelligence methods such as Reasoning, Machine Learning, Problem Solving, Perception, and Linguistic Intelligence.
- As AI technology becomes more advanced, it will likely be used more in areas related to intellectual property. This could lead to new legal issues and problems.
- Some of the IPR issues related to AI generated output are as follows:
    - Ownership and Authorship
    - Copyright Challenges
    - Patent Law
    - Other IPR Issues like data privacy, deep fakes, security of contents and alike
- AI technology has had an impact on landmark judgments passed by the courts in India. Hence many judgements by the court of law demonstrate the demonstrate the need for clarity and amendments in Indian intellectual property laws to address the emerging challenges posed by AI technology.
- However, Union Minister of State for Commerce and Industry, in a written reply in the Rajya Sabha on 9th February, 2024 stated Presently, there is no proposal to create any separate right so ram end the law in the context of AI-generated content.

TEST YOURSELF

(These are meant for recapitulation only. Answers to these questions are not to be submitted for evaluation)

1. What is artificial intelligence, and how does it differ from other types of computer systems?
2. What are the different uses of AI, and what are their applications?
3. What are some of the ethical concerns surrounding AI, and how are they being addressed?
4. What are some of the most significant recent advancements in AI technology?
5. What are the limitations of AI, and what are some of the challenges facing the field?
6. How can individuals and organizations prepare for the impact of AI on the job market?
7. What is the future of AI, and what are some of the potential implications for society?
8. How can we ensure that AI is developed and deployed in an ethical and responsible manner?
9. Write a brief note on explaining IPR related challenges in AI generated material. Also describe whether there is requirement of amending the current regime of IPR laws to address the challenges generated out of the used of AI.

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