AI Adoption: Opportunities and Challenges

Outline

A. Introduction

B. An Overview of Artificial Intelligence

C. Opportunities of AI Adoption:

i. Artificial intelligence is promising in enhancing workplace efficiency, economic progress and productivity.

(IMF Report)

ii. The usage of artificial intelligence in government brings transparency, effectiveness, swift service delivery and political participation.

(Albania and Ukraine's AI models in governance)

iii. Artificial intelligence is efficacious in eliminating illiteracy by offering incentives for impactful teaching, examination and evaluation.

(Case study of Estonia)

iv. Artificial intelligence has tendency to transform the healthcare sector by increasing the performance of medicines, diagnostics, surgeries and healthcare research.

(Robotic Lung Transplant)

v. Artificial intelligence is also successful in disaster management, early warning systems and climate change mitigation.

(Flood warnings by AI)

D. Challenges of AI Adoption:

i. AI risks the widening of gap between developed and under-development world, promoting inequality and oppression.

(North-South technological and economic disparities)

ii. The deployment of AI without safety standards threatens the stability of world by engendering extremism, radicalisation and eco-chambering.

(Nexus by Yuval Noah Harari)

iii. AI is a tool for surveillance and maintaining control on human actions, speech and behaviour by both state and interest groups.

(Lavender AI and Facial Recognition of Palestinians)

iv. AI is a vehicle to train autonomous weapons, military drones and robotic aircrafts, unleashing a new technological warfront.

(China's military robot dog and advanced AI weapons)

v. AI is detrimental for water resources

consuming fresh water for cooling and prompting water scarcity.

(The AI Washington Post Report on Data Centres' Water Consumption)

E. Way Forward to Eliminate the Challenges of AI and Uptick its Advantages:

i. Transfer of technology from Tech-savvy nations to the developing and under developed world to make them adaptive to AI.

(Quote of Margarate Fuller)

ii. Devising safety protocols by legislative and administrative reforms for the positive usage of AI.

(EU's AI Act, 2024)

iii. Finding better ways to operate AI in an eco-friendly manner to reduce its repercussions on environment.

(Wastewater Recycling System)

F. Conclusion

"A new frontier of knowledge is being drawn — not by philosophers, but by engineers and algorithms", remarks Henry A. Kissinger in

his book, "The Age of AI". He believes that AI is transformational to human society in a plethora of ways. The advancement in Artificial Intelligence presents new opportunities, challenges and frameworks. The merits of AI are determined by its positive impacts on human society and civilisation. In this regard, Artificial Intelligence has the capacity to enhance workplace productivity and drive economic progress by saving energy on repetitive tasks. In the domain of governance, AI offers transparency, swift delivery of government's services and active political participation. Moreover, AI is pivotal to eradicate illiteracy and educate the people. Additionally, AI can completely revolutionise the healthcare system by minimising diagnostic and prescriptive errors made by doctors. Lastly, AI is also promising in disaster management pertaining to its accurate early-warning potentials. Despite the opportunities, the challenges of AI cannot be overlooked as AI can worsen the inequality between haves and have nots. Similarly, extremism can potentially grow in human societies. The surveillance, scrutiny and autonomous weapons are other concerning aspects of AI technology. Lastly, the water foot-print of AI is an unprecedented cost of this technology. Hence, AI offers many opportunities in political,

economic and social aspects of human life, however, it also poses challenges in a number of ways, which need to be addressed carefully.

Artificial intelligence is the usage of computers and machines to perform those tasks that requires human intelligence, creativity and skills. **Allan Turing** is celebrated to have first proposed the idea of using machines for works other than calculation. The recent advancement in AI is a result of decades long investment, experimentation and innovation. In 2010's, machine learning and in 2020's deep-learning paved way for generative AI models. AI is generally classified into two main frameworks: by capability (**Narrow, Generation** and **Super intelligence**) and by functionality (**Reactive, Limited-Memory, Theory of Mind** and **Self-Aware**). Currently, AI is at the level of Narrow AI, Limited Memory AI and Artificial General Intelligence is the next frontier. Even, at the initial stages of AI, it has influenced the life of human beings in multitudinous ways. In brief, the evolution of AI marks the evolution of human society.

First of all, AI is significant in the field of economy.

It has immense potential to outperform human in factories, industries and service sectors. AI can handle the tedious and repetitive tasks with greater efficiency and accuracy. Moreover, it can perform computional and calculational functions in commerce sector, assisting humans. Similarly, it can improve decision-making, product design and ultimately reduce cost of production. The IMF report suggests that AI can increase economic productivity upto 30% in the upcoming years. Therefore, economic progress can be achieved by leveraging AI.

Similarly, AI can significantly boost the functioning of government. The deployment of AI models can assist to analyse the needs of people, monitor the available resources and deliver services to them in an effective manner. AI models can also cut costs on dispensable ministeries and departments to ensure efficiency. Futhermore, AI can guarantee transparency by evaluating government expenditures, spending of departments and presenting them before people. Experts also believe that AI models have capacity to engage people during convassing and referendums. Recently, Albania introduced an anti-corruption

AI model to probe into corruption. Ukraine also appointed the first AI spokesperson which is helping the government during its war with Russia. In brief, AI is capable of transforming the governments.

Furthermore, AI can be effective in eroding illiteracy and heighten the educational outputs. Many communities from poor and developing world struggle to access education. For them, AI with its trained teachers, examiners, supporters and personalised advisors can be a panacea to acquire knowledge. Likewise, AI can assist teachers in the classrooms by managing the workload and maintaining discipline. Additionally, Artificial Intelligence can also help the students with research and periodicles, saving their time and energy. Estonia's AI Leap 2025 brings AI to schools to expose younger generation to new wave of technology by ensuring its ethical and effective use. Therefore, AI offers promising incentives for education sector.

Additionally, AI can bring remarkable changes to healthcare system. Currently, the healthcare is burdened and overwhelmed to tackle the needs of a large

strata of society. Trained AI robots and chatbots can be helpful in making diagnosis, prescribe medicines and operate surgeries with minimum errors and maximum effectiveness. Moreover, healthcare research for protein patterns, vaccines, antibiotics and medicines can be carried out using artificial intelligence. Robotic lungs transplant, kidney transplant and cancer vaccine research are the noteworthy advances of AI in medical science. The deployment of AI in healthcare is gaining traction from all over the world owing to its significant contribution.

Last but not the least, the role of AI in climate change mitigation is also paramount. Climate change which is the leading crisis of the time can be managed by wisely using Artificial Intelligence. AI is efficacious in disaster-mangement by predicting uncertain weather conditions, cloudbursts and rainfall. As a result, it enhances disaster preparedness to minimise potential damages. It also informs people and authorities about the possible mitigation and reduction strategies on climate change; it actively participates in forestation, waste management and carbon tracing. Google

Flood Hub uses sophisticated technology for flood forecasting as part of early warning system. Many NGO's, UN personnel and governments are making best out of AI for dealing with climate change. Hence, AI is central to modern weather predictions and disaster management.

Above discourse explored the opportunities of Artificial Intelligence. The coming section will shed light on its potential challenges.

First of all, AI technology can possibly increase the gulf between the developed Tech-giant nations and the developing states. This will trigger inequality and disparity. The developed world possesses technology to manufacture and launch best AI models. While, the underdeveloped and developing nations lack infrastructure and large data centres to exploit the full potential of Artificial Intelligence. The changing geo-political scenario and growing economic gaps forebode the dominion of rich countries and deprivation of poor ones in the field of AI. As a result, dependency and exploitation seem to increase manifolds. Case in view is the prevailing North-South technological chasm and

economic disproportion that leaves poor-developed world incapable to fully materialise the benefits of Artificial Intelligence. Consequently, the unfair distribution of AI technology can be utterly exploitative for them.

Moreover, the deployment of Artificial Intelligence without safety protocols is threatening to the peace and stability. AI models are often biased, generating racist and sexist responses. Social media websites, using AI, curate content from internet and real people and sustain the similar prejudices and hatred while filtering and presenting information to users. As a result, algorithmic bias translates into echo-chambering, extremism and radicalisation. The continuous exposure of people to hateful content fuels racial, ethnic and gender-based violence. Yuval Noah Harari also enlightens his readers in "Nexus" on the detrimental implications of AI in disrupting societal harmony. Therefore, AI can prompt fissures among human beings.

intelligence is a Alongside, artificial vehicle for

surveillance and espionage on fellow humans. The emerging technology is efficient to analyze and trace human actions. Governments and interest groups can easily utilise AI for scrutiny and control on their citizens. Consequently, freedom of speech and human liberties can be curtailed by sophisticated AI spying. AI can also be used for racial profiling to target the minority communities in a precise manner. **Israel's AI model Lavender recognizes Palestinians and track down their actions to fulfill the agenda of Israeli authorities.** Therefore, AI is a notorious tool to keep close watch on humans.

Additionally, autonomous weapons with advanced AI technology mark a new era of robotic warfare. Earlier, artillery and ammunition were human controlled but the incorporation of Artificial Intelligence in weaponary empowers robots to take crucial decisions about war. maneuvering Without guided by humans, such weapons make no distinction between combatants and non-combatants, war zones and human settlements. Resultantly the scale of destruction and intensity of wars

can increase to an unprecedented level. Moreover, AI arms race between rival countries in unfolding with new forms of AI drones, aircrafts and missiles being launched. In 2025, China displayed new AI weapons including AI dogs and automatic guns. The AI weaponry indicates a new war front in a relatively fragile world.

Lastly, AI is detrimental for water resources pertaining to high water consumption by AI. Water scarcity is already a ticking bomb in many countries. The advancement in AI further depletes the fresh water reservoirs. AI data centres need millions of litres of water for electricity generation and cooling the chambers. Most of the water consumption by AI companies comes from fresh water resources. After the usage, water becomes hazardous and undrinkable. The Washington Post highlights the water foot print of AI by Google and GPT-3 AI. Google data centres withdrew 29 billion litres of fresh water while GPT-3 evaporated 700,000 litres of fresh water. The global AI demands in

2027 is projected to account 6.6 trillion litres of water, inducing water depletion and water crisis.

The aforementioned paragraphs detailed down the challenges of AI technology. They need to be minimised by taking diligent actions which will be delineated the the following section.

First of all, technology transfer is crucial to utilise the advantages of AI in an equitable manner. The hegemony of few powerful companies need to be dismantled by supplying AI from developed nations to the developing ones. For this, international organisation, regional and transregional groups need to advocate and implement a framework to enable poor countries in the development of AI. Moreover, global treaties and international bodies should be established to share and transfer AI technology among countries. As Margarete Fuller demonstrates, "if you have knowledge, let others light their candles in it". Hence, the knowledge and technology of AI is fundamental.

Moreover, devising safety protocols for the ethical use of AI is the need of the hour. To curb the AI perpetuated extremism and radicalisation, Tech-giants ought to be held accountable by international powers to filter out biased and violent content. Similarly, countries should methodically frame AI policy to draw clear boundaries around chatbots and machines. Alongside, experts should educate people on the deleterious repercussions of unethical handling of AI. European Union is the first organisation to introduce AI Act in 2025 which stands as an example for other nations to follow. In brief, guardrails for AI models are paramount for ethical deployment and operation of AI.

Lastly, water footprint of AI semi-conductors ought to be reduced. It can be ensured by finding alternative ways to fresh water AI consumption. Environmentalists point out to the used or seawater filteration to cool down AI data centres. Furthermore, waste-water recycling system and circular water solutions

...depicted by World Economic Forum can reduce fresh water consumption by AI. Thus, sustainability and consolidation must be prioritised on urgent basis.

In a nutshell, AI lays down many opportunities of political, economic and social value alongside its adverse effects. It is advantageous to boost economic output and attain economic progress. Similarly, it can be significant for efficient delivery of government's services. Moreover, education and healthcare sectors can be completely reformed by AI. Lastly, disaster management is another remarkable aspect of AI. Despite the pros, the cons of AI in terms of widening inequalities, engendering extremism and running spy-wares cannot be overlooked. Furthermore, autonomous weapons and fresh-water consumption are the perilous challenges of AI. However, decisive measures like technology transfers, legislative actions and sustainable AI data centres can outweigh the disadvantages of AI. As philosopher Donal Haraway puts it, " Technology is not neutral. We are inside of what we make, and it's inside of us".