

# Advantages and Risks of Artificial Intelligence on the Labor Workforce in the Developing Countries

Artificial intelligence<sup>1</sup> represents the foremost important outcome of the Fourth Industrial Revolution<sup>2</sup> due to its multiplicity of uses within the military, industrial, economic, in addition to technical fields, medical, educational, and service applications. It is expected to open the door to limitless innovations and lead to more industrial revolutions in a way that will radically change human life. Industrial intelligence<sup>3</sup> will be the engine of progress, growth, and prosperity over the next few years because of the tremendous and accelerating technological development that the world is witnessing in terms of transformations under the Fourth Industrial Revolution.

The world has become accustomed not to wait for the future, but rather to enter it and compete for its technologies, anticipate its challenges, and develop successful solutions for them. This explains the globe relentless approach to investing in activating the technologies of the fourth generation of the industrial revolution, on top of which is artificial intelligence to achieve its ambitious future development goals. This is beyond the awareness of its ABCs and the elimination of illiteracy, and the

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<sup>1</sup> **Artificial intelligence (AI)** refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.

*Artificial intelligence definition, ethics and standards.* (2019, April 9). ResearchGate.

[https://www.researchgate.net/publication/332548325\\_Artificial\\_Intelligence\\_Definition\\_Ethics\\_and\\_Standards](https://www.researchgate.net/publication/332548325_Artificial_Intelligence_Definition_Ethics_and_Standards)

<sup>2</sup> **The Fourth Industrial Revolution** (or Industry 4.0) is the ongoing automation of traditional manufacturing and industrial practices, using modern smart technology. Large-scale machine-to-machine communication (M2M) and the internet of things (IoT) are integrated for increased automation, improved communication and self-monitoring, and the production of smart machines that can analyze and diagnose issues without the need for human intervention.

Technologies of the fourth Industrial Revolution: Towards national strategies. (2021). *Great Power Politics in the Fourth Industrial Revolution*. <https://doi.org/10.5040/9780755607037.ch-001>

<sup>3</sup> **Industrial intelligence** refers to the use of artificial intelligence (AI) in industry. In particular, to use of "weak AI." Weak AI enables machines to perform certain carefully defined tasks, by giving them narrow sets of human-like abilities. Tasks such as speech recognition or image recognition. In an industrial context, weak-AI development focuses especially on equipping machines to process large quantities of data and on designing complex machine processes.

*Industrial intelligence - A business intelligence-based approach to enhance manufacturing engineering in industrial companies.* (n.d.). ResearchGate.

[https://www.researchgate.net/publication/275068690\\_Industrial\\_Intelligence\\_-\\_A\\_Business\\_Intelligence-based\\_Approach\\_to\\_Enhance\\_Manufacturing\\_Engineering\\_in\\_Industrial\\_Companies](https://www.researchgate.net/publication/275068690_Industrial_Intelligence_-_A_Business_Intelligence-based_Approach_to_Enhance_Manufacturing_Engineering_in_Industrial_Companies)

adoption of many economic sectors such as health, education, services, and other vital sectors on it, as well as the great economic opportunities that it provides to many economic sectors in the globe. Also, artificial intelligence's ability to achieve intense profits with the application of its uses and reliance on the accurate information and advice it provides, with its positive effects in reducing dependence on the human element and labor, which raises the quality of products and reduces spending.

In order to promote the development and acceleration of the activation of artificial intelligence applications at all governmental and private levels, most countries have adopted many mechanisms, including the development of specialized scientific competencies and local capabilities in the field of artificial intelligence, and the training of government employees through their participation in specialized courses in data science and the creation of artificial culture. Social groups to facilitate the spread of the use of applications that depend on these technologies and to create digital citizens able to deal with them. Also, strengthening the concerted efforts of governmental, educational, and media institutions to raise awareness of the fundamentals of this field. Moreover, strategies for artificial intelligence were launched and an independent ministry was allocated for it within governments, not only to improve the performance of projects and its positive economic repercussions but also to reduce the number of immigrant workers and to limit the leakage of remittances outside the developing countries.

## **The Fourth Industrial Revolution:**

The Fourth Industrial Revolution was based on the foundations and rules of the Third Revolution<sup>1</sup>, represented by the development of computer technology, internet, which relies on linking and integrating physical or material sciences with digital and biological systems in manufacturing processes. In other words, they are mechanical systems that are controlled electronically, smart machines connected to the internet<sup>2</sup>.

The Fourth Industrial Revolution was preceded by three industrial revolutions: The first from 1760-1840, driven by the invention of the steam engine<sup>3</sup>. The second

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<sup>1</sup> The third revolution brought forth the rise of electronics, telecommunications, and of course computers. Through the new technologies, the third industrial revolution opens the doors to space expeditions, research, and biotechnology.

*The third Industrial Revolution: Implications for planning cities and regions.* (2015, June 15). ResearchGate. [https://www.researchgate.net/publication/278671121\\_The\\_Third\\_Industrial\\_Revolution\\_Implications\\_for\\_Planning\\_Cities\\_and\\_Regions](https://www.researchgate.net/publication/278671121_The_Third_Industrial_Revolution_Implications_for_Planning_Cities_and_Regions)

<sup>2</sup> Liu, M., Ma, J., Lin, L. *et al.* Intelligent assembly system for mechanical products and key technology based on internet of things. *J Intell Manuf* **28**, 271–299 (2017). <https://doi.org/10.1007/s10845-014-0976-6>

<sup>3</sup> *Steam power and the Industrial Revolution: 1760-1840.* (n.d.). SCIPlanet. <https://www.bibalex.org/SCIPlanet/en/Article/Details.aspx?id=71>

began at the end of the 19th century and continued until the early 20th century, powered by electricity<sup>1</sup>. The third appeared in the sixties of the same century through digital computing and mainframe and personal computers with the internet<sup>2</sup>. Then, to reach the peak of its applications in artificial intelligence, biotechnology, 3D printing, and the revolution in the field of social communication and the digital world<sup>3</sup>.

Germany was the initiating country to launch the fourth industrial revolution<sup>4</sup> through the automation of industry and reducing its manpower, so that the human role is limited to monitoring and auditing, and to reach this requires the existence of scientific capabilities that are employed in possessing the advanced technical and digital infrastructure.

The beginning of the Fourth Industrial Revolution at the turn of the 21st century was based on the digital revolution and the mobile Internet. Also, the development of remote sensing devices, 3D printing, artificial intelligence, intelligent robots, automatic transformation, digital technologies and intelligent systems, autonomous vehicles, nanotechnology, and biotechnology, materials' science, energy storage, Quantum computing, robotic frontier guards, and so clever computers that can write stories and compete with the imaginations of novelists<sup>5</sup>.

Among the most important advantages of the Fourth Industrial Revolution<sup>6</sup>:

1. Achieving high rates of economic, social, and human development.
2. Improving and raising the level of human health care.
3. Reducing a lot of time in the development process and generalizing its achievements to the world.
4. Reducing production costs and securing highly efficient and cost-effective services, means of transportation, and communication.

Among the most important negative aspects of the Fourth Industrial Revolution<sup>1</sup>:

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<sup>1</sup> Vale, R. (2018, June 25). *Second Industrial Revolution: The technological revolution*.

<https://richmondvale.org/en/blog/second-industrial-revolution-the-technological-revolution>

<sup>2</sup> *Technology: The third Industrial Revolution*. (2015, May 1). IPE. <https://www.ipe.com/technology-the-third-industrial-revolution/10007759.article>

<sup>3</sup> *Preface*. (n.d.). The Future of Jobs. <https://reports.weforum.org/future-of-jobs-2016/preface/>

<sup>4</sup> *Germany: Industries 4.0*. (n.d.). European Commission |. [https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/DTM\\_Industrie%204.0.pdf](https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/DTM_Industrie%204.0.pdf)

<sup>5</sup> *The Fourth Industrial Revolution*. (n.d.). Foreign Affairs. <https://www.foreignaffairs.com/system/files/c0040.pdf>

<sup>6</sup> *BUILDING JOBS AND PROSPERITY IN DEVELOPING COUNTRIES*. (n.d.). OECD.org - OECD. <https://www.oecd.org/derec/unitedkingdom/40700982.pdf>

1. The domination of large companies in industrial production and the decline of the role of medium and small companies in the production process.
2. The expansion of unemployment, as the automation of industry and the rapid technological development would reduce job opportunities by 50%, affecting the middle and lower classes or those with "simple jobs" that do not require scientific and technical expertise.
3. Inequality has been achieved and the gap between the rich and the poor widens.
4. Imposition of unprecedented challenges on human societies, and some indications are the following:
  - a. It requires comprehensive economic restructuring.
  - b. The comprehensive economic structure is necessarily attached to a social and political one, because achieving the goals of the "Fourth Industrial Revolution" requires an advanced economic, social and political structure, in line with the new content imposed by this revolution "of the concept of comprehensive and sustainable development.
  - c. The ability to bear the consequences of changing cultural and social values, which will be imposed on the margins of the "fourth industrial revolution".

And to keep pace with the Fourth Industrial Revolution and its rapid changes, the world realized the role required of it and launched the National Innovation Strategy, including the economic sectors that stimulate innovation, as well as the higher policy of science, technology, and innovation. It has adopted innovation and renewal as a culture of work and a lifestyle, to build the desired knowledge-based society led by innovators and future visions, to enhance its march, and establish its global position<sup>2</sup>.

Some states have also reformed and reorganized their government to include ministers of artificial intelligence and advanced sciences. Moreover, there is a tendency to focus on human capital development through the development of education and scientific research, considering the rapid future technological and scientific developments.

To know what artificial intelligence is? we must first determine what is meant by human intelligence as it is related to mental abilities such as the ability to adapt to living conditions, benefit from previous experiences, thinking, analysis, planning,

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<sup>1</sup> *Working in 2050: A view of how changes on the work will affect society.* (2017, December 1). ResearchGate. [https://www.researchgate.net/publication/330857673\\_Working\\_in\\_2050\\_A\\_view\\_of\\_how\\_changes\\_on\\_the\\_work\\_will\\_affect\\_society](https://www.researchgate.net/publication/330857673_Working_in_2050_A_view_of_how_changes_on_the_work_will_affect_society)

<sup>2</sup> *INNOVATION AND GROWTH.* (n.d.). OECD.org - OECD. <https://www.oecd.org/sti/39374789.pdf>

problem-solving, sound conclusion and sense of others, in addition to the speed of learning and use of what has been learned properly and beneficially.

Whereas artificial intelligence is a simulation of human intelligence and understanding its nature by creating computer programs capable of simulating intelligent human behavior. Artificial intelligence is currently found everywhere around us, starting with self-driving cars, drones, translation or investment programs and many other applications spread in life.

## Historical Background of Artificial Intelligence:

Thinking about artificial machines appeared in Greek mythology<sup>1</sup>, but their actual appearance was with the foundation of research in 1956, and specifically at Dartmouth College<sup>2</sup>, and that before each of (John McCarthy, Marvin Maine Ski, Allen Newell, Arthur Samuel and Herbert Simon)<sup>3</sup>, as they were able to solve problems in algebra and prove logical English-speaking theories<sup>4</sup>. The historical sequence of artificial intelligence at the global level can be listed as follows:

- In 1822 Charles Babbage designed the world's first "calculator"<sup>5</sup>.
- In 1854, George Boole invented the theory of algebraic logic based on the two values of "zero and true one"<sup>6</sup>.
- In 1921, the term robot was used for the first time in the Czech play "Universal Graphic Robots"<sup>7</sup>.
- In 1940, attempts began to create simple electronic networks that mimic neurons in a primitive way<sup>8</sup>.

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<sup>1</sup> *Greek myths have some scary ideas about robots and A.I.* (2019, March 5). Futurity.  
<https://www.futurity.org/artificial-intelligence-greek-myths-1999792/>

<sup>2</sup> Veisdal, J. (2020, March 7). *The birthplace of AI*. Medium. <https://medium.com/cantors-paradise/the-birthplace-of-ai-9ab7d4e5fb00>

<sup>3</sup> *The Dartmouth artificial intelligence conference: The next 50 years*. (n.d.). Dartmouth College.  
<https://www.dartmouth.edu/~ai50/homepage.html>

<sup>4</sup> Native Software Solutions LLC. (2019, December 24). *History of artificial intelligence*. Native Software Solutions.  
<https://nativess.com/2019/12/24/history-of-artificial-intelligence/>

<sup>5</sup> *Charles Babbage and the emergence of automated reason*. (n.d.). ResearchGate.  
[https://www.researchgate.net/publication/37538625\\_Charles\\_Babbage\\_and\\_the\\_Emergence\\_of\\_Automated\\_Reason](https://www.researchgate.net/publication/37538625_Charles_Babbage_and_the_Emergence_of_Automated_Reason)

<sup>6</sup> *Boole's Algebra of Logic 1847*. (n.d.). Mathematics | University of Waterloo.  
<https://www.math.uwaterloo.ca/~snburris/htdocs/MAL.pdf>

<sup>7</sup> *The Czech play that gave us the word 'Robot'*. (2019, August 9). The MIT Press Reader.  
<https://thereader.mitpress.mit.edu/origin-word-robot-rur/>

<sup>8</sup> *Neural networks - History*. (n.d.). Stanford Computer Science.  
<https://cs.stanford.edu/people/eroberts/courses/soco/projects/neural-networks/History/history1.html>

- In 1948, the scientist "Alan Turing" came up with the first idea of machines with the ability to think like a human being<sup>1</sup>.
- In 1958, the scientist "John McCarthy" invented the programming language "lisp", which is the preferred language in the field of artificial intelligence<sup>2</sup>.
- In the 1980s, Artificial intelligence research witnessed an awakening through the commercial success of "expert systems" that simulate human experts<sup>3</sup>.
- In 1985, the profits of artificial intelligence research reached more than one billion dollars and governments began to fund this research<sup>4</sup>.
- In 1987 the lisp machine market crashed (one of the programming languages and artificial intelligence research witnessed a setback)<sup>5</sup>.
- In 1988, artificial intelligence achieved greater successes in the field of logistical, data mining, and medical diagnosis<sup>6</sup>.

## Artificial Intelligence Fields and Applications

Artificial intelligence is used in many militaries, industrial, economic, technical, medical, educational, and other service fields. Among its most important applications are the following:

- Autonomous cars and drones.
- A robot is a mechanical device that is programmed to work independently of human control. It is designed to perform the work and accomplish the motor and verbal skills that the human can perform. In addition to its many other uses in nuclear reactors, laying wires, repairing underground wire installations, exploring mines, car manufacturing, and other delicate fields.

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<sup>1</sup> Turing, father of the modern computer. (n.d.). The Rutherford Journal - The New Zealand Journal for the History and Philosophy of Science and Technology. <https://www.rutherfordjournal.org/article040101.html>

<sup>2</sup> Stanford's John McCarthy, seminal figure of artificial intelligence is dead at 84. (2017, September 14). Stanford School of Engineering. <https://engineering.stanford.edu/news/stanford-s-john-mccarthy-seminal-figure-artificial-intelligence-dead-84>

<sup>3</sup> Gill, T. G. (1995). Early expert systems: Where are they now? *MIS Quarterly*, 19(1), 51. <https://doi.org/10.2307/249711>

<sup>4</sup> 9 development in artificial intelligence | Funding a revolution: Government support for computing research | The National Academies Press. (n.d.). The National Academies Press. <https://www.nap.edu/read/6323/chapter/11>

<sup>5</sup> Why did the LISP machine market crash in 1987? (n.d.). Quora - A place to share knowledge and better understand the world. <https://www.quora.com/Why-did-the-LISP-machine-market-crash-in-1987>

<sup>6</sup> The coming of age of artificial intelligence in medicine. (n.d.). ResearchGate. [https://www.researchgate.net/publication/23256621\\_The\\_Coming\\_of\\_Age\\_of\\_Artificial\\_Intelligence\\_in\\_Medicine](https://www.researchgate.net/publication/23256621_The_Coming_of_Age_of_Artificial_Intelligence_in_Medicine)

- Non-linear control is like rail control. Smart devices that can perform mental operations such as checking industrial designs, monitoring processes, and making decisions.
- Cognitive simulation using computers to test theories about how the human mind works and the functions it performs such as recognizing familiar faces and sounds, recognizing handwriting, image processing, extracting data, and useful information from them, and activating memory.
- Computer applications in the medical diagnosis in clinics, hospitals, and the conduct of surgical operations.
- Artificial intelligence programs in analyzing economic data such as the stock exchange and developing stock trading systems.
- Games programs such as chess games and video games.
- Google search clusters on your computer via the Internet. Special applications for learning different natural languages, rules for understanding written and spoken languages automatically, answering questions with pre-programmed answers, and automatic language translation systems for languages in real-time.
- Expert systems that can perform tasks in a manner similar to the method of experts and help them make their decisions accurately depending on a set of logical operations to reach a correct decision or a set of logical options, and after these more and more important concerns of artificial intelligence in the present and the future.
- Smart home services, self-propelled/operated weapons, smartphones, smart TVs, and hundreds of other apps.

## **The Motives of Nations direction to activate Artificial Intelligence**

The state's worldwide relentless approach towards the fourth-generation technologies of the industrial revolution represented in artificial intelligence, which is the language of the future that cannot be detached from the awareness of its ABCs the elimination of illiteracy in it, the safe reliance of health, education, services, and other vital sectors on it.

Developing countries then proceeded to establish specialized scientific competencies and local capabilities in the field of artificial intelligence and to organize specialized training courses for government employees in data science. The aim is to create a culture of artificial intelligence among the groups of society to facilitate the spread of the use of applications that depend on these technologies and to create a digital citizen who is able to deal with them. Through joining efforts between governmental, educational, and media institutions to raise community awareness of the fundamentals of this field, with the establishment of research centers that

contribute to the development of the various sectors and qualify them to receive the necessities of artificial intelligence.

Among the most important motives of most countries to seek to activate artificial intelligence in its economic production and service sectors are the following:

- The industrial sector is considered one of the main important economic sectors at the level globally, as it is moving aggressively to activate the policy of diversifying sources of income. Consequently, this sector affects the state's economic position, and this requires supplying this important vital sector with the outputs of the Fourth Industrial Revolution, most notably artificial intelligence techniques<sup>1</sup>.
- Artificial intelligence is a necessity due to the dependence of the health, education, and services sectors on it<sup>2</sup>. It will also serve other vital sectors such as transport through unmanned airplanes, autonomous cars, flying taxis, metros, and all land and sea transportation<sup>3</sup>.
- Artificial intelligence has become rapidly developing in all areas of life, such as health, for its ability to assist the medical staff in diagnosing and treating diseases, prescribing drugs, conducting surgeries, and better accessing patient files with voice commands, and patients can book appointments through it<sup>4</sup>.
- There is a possibility for self-education and development through artificial intelligence programs such as learning, reasoning, self-correcting and self-programming machines<sup>5</sup>.
- Artificial intelligence contributes to the provision of legal advice<sup>6</sup> and the achievement of interactive education<sup>7</sup> as it is used in the security and military fields<sup>1</sup>.

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<sup>1</sup> *Opportunities of Artificial Intelligence*. (n.d.).

[https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652713/IPOL\\_STU\(2020\)652713\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652713/IPOL_STU(2020)652713_EN.pdf)

<sup>2</sup> *Accelerating Artificial Intelligence in health and care*. (n.d.). Welcome to Wessex Academic Health Science Network.

<https://wessexahsn.org.uk/img/news/AHSN%20Network%20AI%20Report-1536078823.pdf>

<sup>3</sup> *A time of unprecedented change in the transport system*. (n.d.).

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/780868/future\\_of\\_mobility\\_final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/780868/future_of_mobility_final.pdf)

<sup>4</sup> *Medical technology*. (2011, December 23). Healthcare News & Insights | Healthcare Business Tech.

<https://www.healthcarebusinesstech.com/medical-technology/>

<sup>5</sup> *Artificial Intelligence and Inclusion Compendium of Promising Initiatives*. (n.d.).

<https://unesdoc.unesco.org/ark:/48223/pf0000374644>

<sup>6</sup> Brooks, C., Gherhes, C., & Vorley, T. (2020). Artificial intelligence in the legal sector: Pressures and challenges of transformation. *Cambridge Journal of Regions, Economy and Society*, 13(1), 135-152.

<https://doi.org/10.1093/cjres/rsz026>

<sup>7</sup> *Artificial intelligence trends in education: A narrative overview*. (n.d.). ResearchGate.

[https://www.researchgate.net/publication/327902022\\_Artificial\\_Intelligence\\_trends\\_in\\_education\\_a\\_narrative\\_overview](https://www.researchgate.net/publication/327902022_Artificial_Intelligence_trends_in_education_a_narrative_overview)



- Artificial intelligence reduces hardships and dangerous actions to humans, such as exploration and rescue operations during natural disasters that require muscle strength<sup>2</sup>.
- Artificial intelligence can be used in expert systems that are based on knowledge bases and facial recognition technology<sup>3</sup>.
- The education system will change as a concept and as a result of applying the principles of the Fourth Industrial Revolution, as it will focus on sensory education to meet the requirements of the industrial sector and artificial intelligence<sup>4</sup>.
- Artificial Intelligence has the ability to provide new job opportunities<sup>5</sup>, provide services at a cheap cost<sup>6</sup>, and contribute to maintaining security. It also provides mechanisms and solutions to confront challenges, including cybercrime<sup>7</sup>.

## Mechanisms to activate Artificial Intelligence

Due to the great economic opportunities provided by artificial intelligence to many economic sectors in the world, and its ability to achieve huge profits while applying its uses and relying on accurate information and the advice it provides, as well as its positive effects in reducing dependence on the human element and employment, which raises the quality of products and reduces spending, most governments has adopted many mechanisms not only to improve project performance but also to reduce the number of expatriate workers and amend the imbalance in the labor market structure and demographics. Among the most important of these mechanisms are the following:

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<sup>1</sup> *Artificial Intelligence and the Future of Warfare*. (n.d.). Chatham House – International Affairs Think Tank. <https://www.chathamhouse.org/sites/default/files/publications/research/2017-01-26-artificial-intelligence-future-warfare-cummings-final.pdf>

<sup>2</sup> *3 ways AI can improve disaster resilience and relief efforts*. (n.d.). World Economic Forum. <https://www.weforum.org/agenda/2020/01/natural-disasters-resilience-relief-artificial-intelligence-ai-mckinsey/>

<sup>3</sup> *The facts on facial recognition with artificial intelligence*. (n.d.). Amazon Web Services, Inc. <https://aws.amazon.com/rekognition/the-facts-on-facial-recognition-with-artificial-intelligence/>

<sup>4</sup> *Artificial intelligence in industry*. (n.d.). siemens.com Global Website. <https://new.siemens.com/global/en/company/stories/industry/ai-in-industries.html>

<sup>5</sup> Staff Writers. (2020, May 14). Jobs of the future: Artificial intelligence | BestColleges.com. <https://www.bestcolleges.com/blog/future-proof-industries-artificial-intelligence/>

<sup>6</sup> *The 10 Best Examples Of How Companies Use Artificial Intelligence In Practice*. (n.d.). Forbes. <https://www.forbes.com/sites/bernardmarr/2019/12/09/the-10-best-examples-of-how-companies-use-artificial-intelligence-in-practice/?sh=4d1a56e07978>

<sup>7</sup> *Artificial intelligence and machine learning in cybercrime detection*. (n.d.). MDPI - Publisher of Open Access Journals. [https://www.mdpi.com/journal/futureinternet/special\\_issues/Cybercrime\\_Detect](https://www.mdpi.com/journal/futureinternet/special_issues/Cybercrime_Detect)

- Raising awareness and educating the public and minorities in the society about the concept of artificial intelligence to facilitate the widespread use of applications that depend on this technology, through the concerted efforts of governmental, educational, and media institutions to create a digital citizen capable of dealing with these technologies<sup>1</sup>.
- Creating awareness among the leaders of institutions, managers, and employees of government agencies of the importance of artificial intelligence and its use to facilitate the adoption of this technology in the work and development of services in those agencies<sup>2</sup>.
- Forming work teams with the knowledge of innovation executives in government institutions to study the opportunities and challenges facing these entities in developing their services and electronic systems by relying on artificial intelligence techniques and making plans to implement them and find solutions to the challenges they will face<sup>3</sup>.
- Developing scientific competencies and local capabilities specialized in the field of artificial intelligence and training government employees by encouraging them to pay attention to computer science and engaging them in specialized data science courses to develop knowledge of how to use artificial intelligence techniques<sup>4</sup>.
- Launching educational programs in universities that keep pace with the expected change in future jobs<sup>5</sup>.
- Establishing research centers to develop the various sectors in the developing countries and qualify them to receive the necessities of artificial intelligence<sup>6</sup>.
- Establishing a research center that serves the transportation sector and contributes to its development by offering all services provided by the authority through artificial intelligence technologies such as flying taxis, metro, and all land and marine transportation means<sup>7</sup>.

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<sup>1</sup> *Artificial Intelligence in Society*. (n.d.). European Commission | Choose your language | Choisir une langue | Wählen Sie eine Sprache. <https://ec.europa.eu/jrc/communities/sites/jrccties/files/eedfee77-en.pdf>

<sup>2</sup> *Building the AI-powered organization*. (2019, July 1). Harvard Business Review. <https://hbr.org/2019/07/building-the-ai-powered-organization>

<sup>3</sup> *5 challenges for government adoption of AI*. (n.d.). World Economic Forum. <https://www.weforum.org/agenda/2019/08/artificial-intelligence-government-public-sector/>

<sup>4</sup> *Regulating artificial intelligence systems: Risks, challenges, competencies, and strategies* 29 *Harvard Journal of Law & Technology* 2015-2016. (n.d.). <https://heinonline.org/HOL/LandingPage?handle=hein.journals/hjlt29&div=15&id=&page=>

<sup>5</sup> *Careers in artificial intelligence*. (2020, August 29). EDUCBA. <https://www.educba.com/careers-in-artificial-intelligence/>

<sup>6</sup> *US establishes 7 AI research institutes*. (2020, August 27). HPCwire. <https://www.hpcwire.com/2020/08/27/us-announces-formation-7-ai-institutes/>

<sup>7</sup> *Constructionweekonline.com*. (n.d.). Latest Construction News | Construction Week Online. <https://www.constructionweekonline.com/article-50762-the-future-of-transport-has-flying-taxis-and-smart-metro-lines>

- The trend of educational institutions to the technology of learning in virtual reality to be in line with artificial intelligence<sup>1</sup>.
- Developing the services of some government departments targeting the public relying on artificial intelligence techniques<sup>2</sup>.
- Dedicating a separate subject to artificial intelligence in schools and universities to consolidate its concept among students and adopt everything that contributes to increasing the number of outstanding students admitted to universities and those who possess a sensory understanding and manual skills during the next ten years<sup>3</sup>.
- launching “Silicon Cities” globally<sup>4</sup>.
- Developing the Watson system for cognitive computing<sup>5</sup>.
- Establishing an artificial intelligence laboratory with the knowledge of Smart to help governments agencies develop their services using artificial intelligence and cognitive computing techniques<sup>6</sup>.
- Establishing a ministry for Artificial Intelligence within the state’s government in its new ministerial formation<sup>7</sup>.
- Launching of the automated engineer by Infrastructure Development in the developing countries who performs the tasks of an architect from design to implementation as an alternative to the human engineer<sup>8</sup>.

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<sup>1</sup> *Applying artificial intelligence to virtual reality: Intelligent virtual environments*. (n.d.). ResearchGate. [https://www.researchgate.net/publication/2329214\\_Applying\\_Artificial\\_Intelligence\\_to\\_Virtual\\_Reality\\_Intelligent\\_Virtual\\_Environments](https://www.researchgate.net/publication/2329214_Applying_Artificial_Intelligence_to_Virtual_Reality_Intelligent_Virtual_Environments)

<sup>2</sup> *AI Watch Artificial Intelligence in public services*. (n.d.). [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399\\_misuraca-ai-watch\\_public-services\\_30062020\\_def.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf)

<sup>3</sup> *Exploring the impact of artificial intelligence on teaching and learning in higher education*. (n.d.). ResearchGate. [https://www.researchgate.net/publication/321258756\\_Exploring\\_the\\_impact\\_of\\_artificial\\_intelligence\\_on\\_teaching\\_and\\_learning\\_in\\_higher\\_education](https://www.researchgate.net/publication/321258756_Exploring_the_impact_of_artificial_intelligence_on_teaching_and_learning_in_higher_education)

<sup>4</sup> *7 surprising tech hotspots around the world*. (2014, February 26). Business 2 Community. <https://www.business2community.com/tech-gadgets/7-surprising-tech-hotspots-around-world-0791743>

<sup>5</sup> *IBM cognitive – Get started with cognitive technology*. (n.d.). IBM - United States. <https://www.ibm.com/watson/advantage-reports/getting-started-cognitive-technology.html>

<sup>6</sup> *Delivering Artificial Intelligence in Government*. (n.d.). IBM Center for The Business of Government |. <https://www.businessofgovernment.org/sites/default/files/Delivering%20Artificial%20Intelligence%20in%20Government.pdf>

<sup>7</sup> *The ministry of artificial intelligence*. (n.d.). Centre for International Governance Innovation. <https://www.cigionline.org/articles/ministry-artificial-intelligence>

<sup>8</sup> *Artificial intelligence in the construction industry*. (2020, August 27). Roland Berger. <https://www.rolandberger.com/nl/Insights/Publications/Artificial-intelligence-in-the-construction-industry.html>

# Advantages and Risks of A.I.

Examining the future of work tend to appear in discussions on Artificial Intelligence. By the future of work<sup>1</sup>, we mean the effect of AI on the afford of and demand for human labor<sup>2</sup>. The main reason for anxiety in this space is that the extent to which propels in AI enable artificial agents to try and do tasks cheaply and subsequently replace human agents who earn income by doing those tasks<sup>3</sup>. Scientists at the beginning of the millennium<sup>4</sup> imagined tasks as lying in an exceedingly field of plains, hills, and mountains within which the considerately measured preliminary difficulty of a task is reflected by its altitude in this landscape. At the mountaintops, there are tasks like social interaction, eye-hand coordination, locomotion, etc. At several subjects, there are tasks like playing chess, image recognition, and others. Advancing AI is related to a rising surge during this scene. Over time, AI systems will grow to be competent at many plain or ridge tasks, then there will the risky depressions.

Inquiry into AI and the future of work extends a long tradition of research about the impacts of automation on the labor market<sup>5</sup>. Automation concerns have traditionally been more focused on robotic systems with limited independent intelligence<sup>6</sup> or adaptability usually applied to relatively lower-skilled tasks<sup>1</sup>. These

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<sup>1</sup> *AI and the future of work*. (2018, April 4). WIRED. <https://www.wired.com/wiredinsider/2018/04/ai-future-work/>

<sup>2</sup> *Toward understanding the impact of artificial intelligence on labor*. (2019, April 2). PNAS. <https://www.pnas.org/content/116/14/6531>

<sup>3</sup> Wildhaber, I. (2018). Artificial intelligence and robotics, the workplace, and workplace-related law. *Research Handbook on the Law of Artificial Intelligence*, 577-608. <https://doi.org/10.4337/9781786439055.00036>

<sup>4</sup> *When will computer hardware match the human brain?* by Hans Moravec. (n.d.). Journal of Evolution and Technology. <https://www.jetpress.org/volume1/moravec.htm>

<sup>5</sup> *Five lessons from history on AI, automation, and employment*. (2017, November 28). McKinsey & Company. <https://www.mckinsey.com/featured-insights/future-of-work/five-lessons-from-history-on-ai-automation-and-employment>

<sup>6</sup> *The use of artificial agents in the domestic security*. (2019, May 28). Course Hero | Make every study hour count. <https://www.coursehero.com/file/ps8coqs/The-use-of-artificial-agents-in-the-domestic-security-space-is-already-common/>

frameworks act based on explicitly programmed instructions. Current AI frameworks don't require such unequivocal direction and can act based on experiences learned from data or experts. Such adaptable artificial agents circumvent Polanyi's paradox<sup>2</sup> that states that human expertise consists of more than we can tell or instruct. AI systems are progressively competent in learning desired expertise as long as there are samples of information from which to learn—even if we cannot unequivocally express the required mastery.

Artificial agents are now increasingly able to do a developing share of assignments that we have ordinarily depended on humans to do through the labor market. This includes medical/radiological diagnosis<sup>3</sup>, driving vehicles<sup>4</sup>, writing specific types of news reports<sup>5</sup>, and other tasks.

A successful labor market serves two key purposes: to supply labor to do productive work and to supply a source of workers' income through earned compensation<sup>6</sup>. The future of work question considers what sorts of impacts the increase of progressed artificial agents has on the compelling operation of the labor market, particularly to the capacity of workers to earn significant wages. This can be an emotionally and politically charged consideration given the economic, social, and cultural functions that employment serves in human social orders.

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<sup>1</sup> *Are robots stealing our jobs?* - Eric Dahlin, 2019. (2019, May 10). SAGE Journals.  
<https://journals.sagepub.com/doi/full/10.1177/2378023119846249>

<sup>2</sup> LUCA. (n.d.). *What is the Polanyi paradox?* What is the Polanyi paradox? <https://luca-d3.com/data-speaks/technology-dictionary/polanyi-paradox>

<sup>3</sup> *Artificial intelligence in radiology.* (n.d.). PubMed Central (PMC).  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6268174/>

<sup>4</sup> *How AI is paving the way for autonomous cars.* (2019, October 17). Machine Design.  
<https://www.machinedesign.com/mechanical-motion-systems/article/21838234/how-ai-is-paving-the-way-for-autonomous-cars>

<sup>5</sup> *AI Making Waves In News And Journalism.* (n.d.). Forbes.  
<https://www.forbes.com/sites/cognitiveworld/2019/08/23/ai-making-waves-in-news-and-journalism/?sh=1eaa9e0b7748>

<sup>6</sup> *Understanding the historic divergence between productivity and a typical worker's pay: Why it matters and why it's real.* (n.d.). Economic Policy Institute. <https://www.epi.org/publication/understanding-the-historic-divergence-between-productivity-and-a-typical-workers-pay-why-it-matters-and-why-its-real/>

The uncertain conventional recovery of the global economy since the COVID-19 pandemic<sup>1</sup> served to stoke employment fears, particularly given the aspects of the recuperation that has led it to be exemplified as a “jobless recovery”, one where macroeconomic growth occurs despite employment levels drop. This drift coincides with another recent trend appearing in a very steady decline within the labor share of national income compared to the share of national income going to capital<sup>2</sup>. Therefore, labor is getting a lower share of returns from economic growth and expanded national productivity.

The net impact may will be a labor market that is progressively weaker at funding workers’ standards of living even as automated systems, including AI systems, do a growing share of total profitable work. Economists, Financial-policy analysts have responded to these concerns by calling for decoupling wages/living standards from employment via universal basic income (UBI)<sup>3</sup> or guaranteed salary schemes. There are cost, incentives, motivating forces, and administration difficulties with these schemes.

Near-term trends in our new AI-enabled world show that artificial specialists are having a disruptive impact on traditional work patterns<sup>4</sup>. This disruption isn't continuously negative. Disruption has resulted in new labor opportunities faces the

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<sup>1</sup> *The global economic outlook during the COVID-19 pandemic: A changed world.* (2020, June 8). World Bank. <https://www.worldbank.org/en/news/feature/2020/06/08/the-global-economic-outlook-during-the-covid-19-pandemic-a-changed-world>

<sup>2</sup> *A new look at the declining labor share of income in the United States.* (2019, May 22). McKinsey & Company. <https://www.mckinsey.com/featured-insights/employment-and-growth/a-new-look-at-the-declining-labor-share-of-income-in-the-united-states>

<sup>3</sup> **Universal basic income (UBI)** is a government program in which every adult citizen receives a set amount of money on a regular basis. The goals of a **basic income** system are to alleviate poverty and replace other need-based social programs that potentially require greater bureaucratic involvement.

The Stanford Basic Income Lab. (n.d.). *Stanford basic income lab | What is UBI.* <https://basicincome.stanford.edu/about/what-is-ubi/>

<sup>4</sup> *The impact of artificial intelligence - Widespread job losses.* (2020, September 24). IoT For All. <https://www.iotforall.com/impact-of-artificial-intelligence-job-losses>

world with the emergence and features of “microwork”<sup>1</sup>. Microwork alludes to short-term tasks or jobs for humans like survey-taking, driving, cleaning, and other tasks. Generally, the value of crowdsourcing and flexibly coordinating employment contracts for these sorts of work has been restrictive. AI-powering platforms like TaskRabbit, Uber, Lyft, and Amazon’s Mechanical Turk have reduced these costs significantly<sup>2</sup>. Microwork-coordinating services have developed in response. Concerns remain about the status and benefits of micro workers within the labor markets<sup>3</sup>.

Economists observed differential vulnerability of jobs to mechanization and loss in recent economic data. Middle-skill routine-based jobs such as production, manufacturing, operators, are historically more at risk of higher job losses during economic busts and slower recuperation in economic booms than low-skill and high-skill jobs<sup>4</sup>; this is often the effect of “job polarization<sup>5</sup>.” Other near-term labor market impacts of artificial agents include a deskilling effect by which robotization results into the loss of specialized human abilities or aptitudes. Automation diminishes labor demand for individuals with the skills in question, and workers reorient away from learning skills that have already been computerized amid their training. Nevertheless, the approach of a division of labor had a comparable deskilling effect. Therefore, the significance of this effect continues to be dubious. A potential positive impact of AI

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<sup>1</sup> *Microwork platforms: A challenge for artificial intelligence, a challenge for employment?* (2019, June 12). Data Big and Small. <https://databigandsmall.com/2019/06/12/microwork-platforms-a-challenge-for-artificial-intelligence-a-challenge-for-employment/>

<sup>2</sup> *Flexibility in the gig economy: Managing time on three online piecework platforms*. (n.d.). ResearchGate. [https://www.researchgate.net/publication/322938443\\_Flexibility\\_in\\_the\\_gig\\_economy\\_Managing\\_time\\_on\\_three\\_online\\_piecework\\_platforms](https://www.researchgate.net/publication/322938443_Flexibility_in_the_gig_economy_Managing_time_on_three_online_piecework_platforms)

<sup>3</sup> *Global Commission on THE FUTURE OF WORK Job quality in the platform economy*. (n.d.). International Labour Organization. [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms\\_618167.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_618167.pdf)

<sup>4</sup> *The Vanishing Middle: Job Polarization and Workers’ Response to the Decline in Middle-Skill Jobs*. (n.d.). Federal Reserve Bank of Kansas City. <https://www.kansascityfed.org/publicat/econrev/pdf/13q1tuzemen-willis.pdf>

<sup>5</sup> Furness, D. (2019, February 5). *AI experts warn about automation and "Job polarization"*. Emerj. <https://emerj.com/ai-future-outlook/more-ai-experts-warn-about-automation/>

deployment includes improved commuting because of more secure independent unmanned vehicles<sup>1</sup>.

One concern with the development of AI systems is that the investment required for AI improvement is accessible only to a really restricted few, such as very-high-tech firms, firms with access to large databases, and highly skilled specialized workers. This implies that returns, efficiency, and productivity gains from automation-by-AI accrue to a very restricted group of “superstar firms”<sup>2</sup>. At the same time, if jobs continue to be automated, then the fundamental income-generating function of labor reduces. This has the impact of further increasing income disparity at the national and worldwide levels. The occupation’s vulnerability to automation: the occupation necessity for creative intelligence, social intelligence, and accomplished perception and manipulation<sup>3</sup>.

Policy analysts have begun to articulate the limit of AI automatability<sup>4</sup>: Basically, AI excels at tasks that are well-defined, repetitive, or routine, and that performance is easy to judge<sup>5</sup>. The current difficulty AI systems experience with chaotic situations reflects a slight lag in AI progress within the subfield of computerized planning<sup>6</sup>.

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<sup>1</sup> *The potential implications of autonomous vehicles in and around the workplace.* (n.d.). PubMed Central (PMC). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6164975/>

<sup>2</sup> *Automation and the Future of Work.* (n.d.). Centre for International Governance Innovation. <https://www.cigionline.org/sites/default/files/documents/Paper%20no.174lowres.pdf>

<sup>3</sup> Girling, R. (2016, December 14). *AI and the future of design: What skills do we need to compete against the machines?* O’Reilly Media. <https://www.oreilly.com/radar/ai-and-the-future-of-design-what-skills-do-we-need-to-compete-against-the-machines/>

<sup>4</sup> *Humans will add to AI’s limitations.* (2020, June 11). The Economist. <https://www.economist.com/technology-quarterly/2020/06/11/humans-will-add-to-ais-limitations>

<sup>5</sup> *Artificial intelligence (AI) in assessment.* (n.d.). <https://assessment.aon.com/en-us/online-assessment/ai-in-assessment>

<sup>6</sup> *Artificial Intelligence: Algorithms, Operational Environments and Hyperbole.* (n.d.). hsdland Security Digital Library at NPS. <https://www.hsdland.org/?view&did=823536>



The impact of commonplace reaction times on vulnerability to robotization will be tweaked by chaos or the amount of task-switching required<sup>1</sup>, while this balance could be complex. Long reaction times and low levels of chaos indicate longer periods spent on single errands with restricted exchanges between different types of tasks. The automated planning problem, automated assurance of how and when to switch among which tasks, in this regime is relatively easier to solve and illuminate. Subsequently, occupations in these administrations are likely to have a higher susceptibility to automation. Automated planning within the high-chaos/short-response-time regime is a much harder problem. High chaos implies there is a bigger number of distinct functions an AI system must be designed to accomplish along with being able to respond to the randomness of the order of presentation of the tasks being accomplished—designing an AI to perform acceptably in such an administration involves planning for and managing significant complexity blended with exceptionally very short timeframes.

The low-chaos/short-response-time has verifiably been a regime of high automation activity, assembly line settings. Within the low-chaos/short-response-time case, the brief reaction times required can be physically burdening for the human workers, but since there is a little collection of tasks, the design and planning challenges are of much lower complexity. These challenges can be satisfactorily addressed through things such as cautious factory layout and portfolios of statically modified robots. Essential automation, not necessarily automation-by-AI, has adequately handled this regime along with the maturation of the modern production line.

The high-chaos/long-response-time represents a curious automation conundrum. During this regime, there are still plenty of capacities to master and a noteworthy, automated planning problem but at a longer timescale. Numerous of those functions requires a fine-tuned capacity to explore social and cultural standards. It is not however clear if more intelligent AI will be capable of making the fine-grained

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<sup>1</sup> *Effects of automation and task load on task switching during human supervision of multiple semi-autonomous robots in a dynamic environment.* (n.d.). PubMed. <https://pubmed.ncbi.nlm.nih.gov/20658389/>

coordinates choices required to exceed expectations during this regime even in case there is no time crunch.

Whereas this system should provide valuable direction to designers and engineers of artificial agents, this indicates that numerous of the automation endeavors to this point might not necessarily have focused on the complete track of occupations amenable to computerization.

Earlier, most automation endeavors have been in factory-like environments<sup>1</sup>. This inconsistency appears to demonstrate that automation has excessively influenced occupations that require less formal education, like factory workers, instead of more white-collar occupations, like accountants. Usually questionable since of the lower cognitive prerequisites and higher mechanical aspects for that quadrant, leading to a more direct approach toward robotic design. Nevertheless, signs of progress in AI are raising the bar on the cognitive capacities that automation-via-AI can exhibit.

## **The Economic Implications of activating Artificial Intelligence technologies**

Several studies and research have indicated the expected economic impacts and implications of activating artificial intelligence techniques in various economic sectors at the national and global levels, which can be referred to as follows:

- Today, the global investments in artificial intelligence exceed those in oil exploration<sup>2</sup>.
- 47% of current jobs will disappear in the coming years due to artificial intelligence<sup>3</sup>.
- In the future, automation is expected to replace about 83% of jobs with wages exceeding \$20 an hour, which is a matter of concern for its implications for

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<sup>1</sup> *Automation, robotics, and the factory of the future*. (2017, September 7). McKinsey & Company. <https://www.mckinsey.com/business-functions/operations/our-insights/automation-robotics-and-the-factory-of-the-future>

<sup>2</sup> *Is artificial intelligence a promising global investment opportunity?* (2020, October 5). Gulf Business. <https://gulfbusiness.com/is-artificial-intelligence-a-promising-global-investment-opportunity/>

<sup>3</sup> *47% of jobs will vanish in the next 25 years, say Oxford University researchers*. (2019, January 18). Big Think. <https://bigthink.com/philip-perry/47-of-jobs-in-the-next-25-years-will-disappear-according-to-oxford-university>

unemployment rates and income disparities for countries whose citizens occupy these endangered jobs<sup>1</sup>.

- In 2030, artificial intelligence is expected to add more than \$ 15 trillion to the global the Gross domestic product (GDP)<sup>2</sup>.
- The reflection of artificial intelligence on medical development is adding 5 new years to a person's life in every decade ... meaning that a person's health at the age of 90 will have health similar to a person who is 65 today<sup>3</sup>.

## Suggested Strategy for A.I. in Developing Countries

The transitional decline in the Gross domestic product (GDP)<sup>4</sup> in developing countries is in a crucial decrease. To prevent this growing divergence, policymakers in developing economies will need to take measures to increase productivity and improve skills among untalented workers worldwide<sup>5</sup>.

New technology risks are causing gaps between the poor, middle and rich classes in societies by shifting more investment to advanced economies where automation has already been established. This dilemma will create negative consequences on employment by threatening to replace, rather than complete, a growing workforce, which has traditionally presented an advantage in less developed economies.

The current wave of technological change based on developments in artificial intelligence has given rise to widespread concerns about job losses and increasing inequality. In an expanded model where robots only replace unskilled labor, terms of trade, and hence GDP, may permanently decline for countries that have a relatively good talent for unskilled labor. This argues that significant opportunities in terms of increasing productivity could arise given the very low costs of capital that some

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<sup>1</sup> *Automation and Artificial Intelligence*. (n.d.). Brookings - Quality. Independence. Impact.

[https://www.brookings.edu/wp-content/uploads/2019/01/2019.01\\_BrookingsMetro\\_Automation-AI\\_Report\\_Muro-Maxim-Whiton-FINAL-version.pdf](https://www.brookings.edu/wp-content/uploads/2019/01/2019.01_BrookingsMetro_Automation-AI_Report_Muro-Maxim-Whiton-FINAL-version.pdf)

<sup>2</sup> PricewaterhouseCoopers. (n.d.). *PwC's global artificial intelligence study: Sizing the prize*. PwC.

<https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html>

<sup>3</sup> *Older adults*. (n.d.). <https://www.apa.org>. <https://www.apa.org/pi/aging/resources/guides/older>

<sup>4</sup> **Gross domestic product (GDP)** is the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period. As a broad measure of overall domestic production, it functions as a comprehensive scorecard of a given country's economic health.

*Gross Domestic Product: An Economy's All*. (n.d.). <https://www.imf.org/external/pubs/ft/fandd/basics/gdp.htm>

<sup>5</sup> *Global impact of artificial intelligence on GDP by region 2030*. (2017, June 27). Statista.

<https://www.statista.com/statistics/785877/worldwide-impact-of-artificial-intelligence-on-gdp/>

applications have shown and the potential for increasing productivity, particularly among the low-skilled workers.

The primary topic focuses on a key difference within the consideration frames for human- versus AI-information processing. One of the reasons the filter bubble phenomenon exists is because we seek to dodge data overload<sup>1</sup>. Our human brains have limited flexibility that contributes to restricted attention frames<sup>2</sup>. Artificial agents' attention outlines can be more adaptable, and the accessible scope regularly improves with innovations in information technology, the key counter lever to AI's more flexible attention-frame is computational productivity<sup>3</sup>.

An expansion to oblige a larger available scope of attention can easily make a task computationally infeasible without a cautious design. A reviewer highlighted the recent research activity on compelling attention mechanisms for AI frameworks. "Big data", including data streams from the IoT<sup>4</sup>, expands the limits of what artificial agents can pay attention to. Appropriate AI implementations may use confined restricted attention frames, although the state of technology permits for massive development of those frames compared to what humans can suit. This contrast in scopes of attention may underlie many of our blind spots in assessing AI impacts.

The moment topic, a few of these discussions highlight could be a type of diminished versatility due to restricted information on how automation influences our

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<sup>1</sup> *Artificial intelligence created filter bubbles. Now it's helping to fight it.* (2019, May 20). TechTalks. <https://bdtechtalks.com/2019/05/20/artificial-intelligence-filter-bubbles-news-bias/>

<sup>2</sup> *A natural history of the human mind: Tracing evolutionary changes in brain and cognition.* (n.d.). PubMed Central (PMC). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2409100/>

<sup>3</sup> *Where machines could replace humans--and where they can't (yet).* (2016, July 8). McKinsey & Company. <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet>

<sup>4</sup> Research, & Markets. (2020, November 10). *Artificial intelligence in big data analytics and IoT markets, 2025 - AI makes IoT data 25% more efficient and analytics 42% more effective for industry.* PR Newswire: press release distribution, targeting, monitoring and marketing. <https://www.prnewswire.com/news-releases/artificial-intelligence-in-big-data-analytics-and-iot-markets-2025---ai-makes-iot-data-25-more-efficient-and-analytics-42-more-effective-for-industry-301169827.html>

lives<sup>1</sup>. By this, we cruel the potential to decrease systemic flexibility or increase the systemic delicacy by depending more on artificial agents. This reduced resilience regularly takes the form of an excessively trusting or insufficiently critical view of artificial agents. This baseless belief is already evident in dealings with the rudimentary artificial agents we currently utilize. It is a manifestation of the human inclination toward automation bias<sup>2</sup>. Automation predisposition highlighted the reported human propensity attribute more validity to outcomes and choices delivered by artificial agents without accounting for the error and bias risks inherent in these agents. This may have critical systemic impacts, the filter bubble phenomenon, hyperpolarization of online discourse<sup>3</sup>. Automation bias also has significant implications for accountability in decision making, which is questions of appeal in the criminal justice system<sup>4</sup>.

One counter-revolutionary approach to combating such impacts would be to deploy additional layers of artificial agents to adjust gaps or deficiencies with the existing agents. Although, the task of consequently adjusting negative AI outcomes or stringing together multiple AI implementations can be troublesome. Both approaches are frequently more difficult than just designing an agent to naturally recognize bad results. Several automated systems are not able to recognize when they are in error states, particularly when these error states relate to social and cultural standards<sup>5</sup>. In general, an effective automated AI regulator may need to be as complex as the system, while, in theory, such regulators would also require regulative direction.

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<sup>1</sup> Vermeulen, B., Kesselhut, J., Pyka, A., & Saviotti, P. (2018). The impact of automation on employment: Just the usual structural change? *Sustainability*, 10(5), 1661. <https://doi.org/10.3390/su10051661>

<sup>2</sup> *Automation bias and errors: Are crews better than individuals?* (n.d.). PubMed. <https://pubmed.ncbi.nlm.nih.gov/11543300/>

<sup>3</sup> *How filter bubbles distort reality: Everything you need to know.* (2019, November 14). Farnam Street. <https://fs.blog/2017/07/filter-bubbles/>

<sup>4</sup> *Criminal justice, artificial intelligence systems, and human rights.* (n.d.). ERA Forum. <https://link.springer.com/article/10.1007/s12027-020-00602-0>

<sup>5</sup> Turner-Lee, N., Resnick, P., & Barton, G. (2019, October 25). *Algorithmic bias detection and mitigation: Best practices and policies to reduce consumer harms.* Brookings. <https://www.brookings.edu/research/algorithmic-bias-detection-and-mitigation-best-practices-and-policies-to-reduce-consumer-harms/>

An extra characteristic negligible response would be to require disclosure-style transparency. The focus here would be to highlight domains where artificial agents act independently or mediate access to information. This focus may help analysts recognize which system's behavior to an auditor, at the minimum, harbor more fundamental basic attitudes toward artificial agents. Less negligibly, the difficulty of automated AI regulation makes a restricted argument in favor of human-in-the-loop regulation of automated systems<sup>1</sup>, especially for critical systems or systems with high-assurance requirements and necessities.

We can summarize the main points of the suggested strategy in the following:

### **1. Governance:**

- Formation of the State's Artificial Intelligence Council.
- Formation of work teams of chief executive officers of innovation in governmental agencies.
- The issuance of a law on the safe use of artificial intelligence.
- Organization of a series of conferences to attract experts in artificial intelligence.
- Development of a global protocol with leading governments in the same field.

### **2. Activation:**

- Organizing field visits to government agencies to understand artificial intelligence.
- Organizing and supporting workshops in all government agencies.
- Organizing an annual global summit on artificial intelligence.
- Launching government accelerators for artificial intelligence.

### **3. Capacity Development:**

- Developing the capabilities of senior government leaders in the field of artificial intelligence.
- Upgrading the skills of all technology-related jobs.
- Organizing training courses for government employees in the field of artificial intelligence.
- Determining a percentage of the specializations on scholarships abroad to study artificial intelligence.

### **4. Application:**

- Providing a percentage of first-line services to the public through artificial intelligence.
- Integrating artificial intelligence with a specific percentage in medical services.

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<sup>1</sup> *Responsibility and AI*. (n.d.). <https://rm.coe.int/responsability-and-ai-en/168097d9c5>

- Increasing reliance on artificial intelligence in routine jobs.

The strategy for artificial intelligence should aim to:

- Adopting artificial intelligence tools and techniques to improve government performance.
- Being the first in the world in artificial intelligence investments.
- Creating a promising new market with high economic value in the region.
- Supporting private sector initiatives and increasing productivity.
- Building a strong base in research and development.

The strategy targets several vital sectors, the most important of which are:

- The transportation sector by reducing accidents and operational costs.
- The health sector by reducing the percentage of chronic and dangerous diseases.
- The space sector by conducting accurate experiments and reducing the rates of costly errors.
- Renewable energy sector through utility management and smart consumption.
- The water sector by conducting accurate analyzes and studies to provide resources.
- The technology sector by raising the proportion of production and public spending.
- The education sector by reducing costs and increasing the desire to learn.
- The environment sector by increasing the percentage of afforestation and planting suitable plants.

This strategy for artificial intelligence covers, the range of services it includes, and the complementarity of the future vision that it envisages. This strategy mainly seeks to develop and organize AI technology tools so that they are an integral part of the government work system worldwide. It also contributes to facing the accelerating changes and achieving a qualitative development in the general performance by building a complete and connected smart digital system that addresses the challenges up-to-date and provides practical and rapid solutions that are qualitative and efficient.

Among the most important future directions of the state in the field of artificial intelligence, through the Ministry of Artificial Intelligence, is the trend to activate the following:

- Establishing basic legislations, laws, and regulatory frameworks worldwide in order to govern artificial intelligence technologies.
- Promoting and intensifying the qualitative investments related to innovation, technological progress, and research and development.
- Providing all services through artificial intelligence and achieving comprehensive integration of artificial intelligence with medical and security services.
- Employing artificial intelligence technologies and applications in all economic sectors, including education, health, transportation, roads, and other sectors.
- Teaching one million programmers to program artificial intelligence.

- Promoting and concerting global efforts and partnerships in the field of artificial intelligence, building expertise at the international level in cooperation with international companies to attract skills, taking advantage of the unprecedented services provided by artificial intelligence techniques, and its role in improving human life that transcends geographical borders to include the world.



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