GMIS and AI

The Global Manufacturing and Industrialisation Summit is a joint endeavour of the United Nations Industrial Development Organization (UNIDO) and the Ministry of Energy and Industry of the United Arab Emirates. First established in 2016, its mission is to harness the trajectory of the Fourth Industrial Revolution and advanced manufacturing technologies for inclusive and sustainable industrialization, fully aligned with the 2030 Agenda for Sustainable Development. To this end, GMIS provides a multi-stakeholder platform for dialogue, action and partnerships, bringing together leaders from the global private sector, national governments, international organizations and development finance institutions, the research community and civil society.

From the outset, artificial intelligence (AI) has featured prominently in the discussions, given its potential to influence the future of manufacturing, through aiding increased efficiency, shortening value chains and facilitating customization and local production, and adding value to the global economy. Along with advanced robotics, 3D printing, the Industrial Internet of Things and wearable technologies, AI was identified as one of five pathway technologies critical to the Fourth Industrial Revolution, following the inaugural GMIS, held in Abu Dhabi in March 2017.

There are also manifold potential gains for wider society through AI, in terms of facilitating smart public infrastructure, transport and the green economy; improving healthcare through superior diagnostic and data gathering capabilities; enhanced capabilities for fighting crime and corruption through larger datasets; aiding industrial safety standards and cybersecurity inter alia.

The section below provides a non-exhaustive overview of the discussions and outputs from GMIS events with respect to AI.

- **GMIS 2017:** AI identified as one of the five pathway technologies underpinning the Fourth Industrial Revolution, in addition to the Ten Principles of 4IR (Outcomes here : https://www.gmisummit.com/past-summits/gmis-2017/gmis2017-outcomes/).

- **GMIS Connect Brazil:** GMIS Connect Brazil was organized jointly with the Confederação Nacional da Indústria (CNI), at TOTVS S.A. headquarters in São Paulo on 11 September 2018 to discuss Fourth Industrial Revolution implementation in the case of Brazil. The second panel session of this event reflected on "Artificial Intelligence and the Human Resources Qualification". It was moderated by Mr. Felipe Esteves Morgado, Executive Manager, National Service for Industrial Training (Serviço Nacional de Aprendizagem Industrial - SENAI). Panellists for the session included Mr. Laercio Cosentino, Founder and CEO of TOTVS S.A.; Mr. Glauco Arbix, Professor, Department of Sociology, the University of São Paulo and former President of the Brazilian Agency for Innovation (FINEP); Mr. Fabio Rua, Director, IBM Latin America; and Mr. Luciano Souza, Director, Secretariat of Innovation and New Businesses, Ministry of Industry, Foreign Trade and Services of Brazil (MDIC).

- Professor Arbix began by noting that it was a difficult juncture for discussing artificial intelligence in Brazil, as the stagnant political situation has reduced the ambition of many local companies to innovate. He said that advanced technologies such as 3D printing, big data analytics, artificial intelligence are in their infancy, but are already entering the market fast.

- He noted that the advanced technologies that are typically grouped together are actually quite distinct, and that of these, artificial intelligence has started to occupy a "preponderant position" in the technological cycle. He concluded by stressing a "people-centric" approach to the Fourth Industrial Revolution.

- Mr. Laercio Cosentino stressed the need to address underlying infrastructure in his contribution, saying that insufficient 3G and 4G connection causes issues for domestic business, and that efforts should be channelled towards technology production.

- Mr. Fabio Rua said that political decisiveness in utilizing artificial intelligence would be key, especially for defining its relationship with citizens, and that existing qualifications regimes needed to be overhauled. He also suggested that the threat posed by automation is overstated, with 250,000 IT positions available at the time.

- Mr. Souza added: " … Everyone fears unemployment, not only because of artificial intelligence but all automation technologies. It is forecasted that less than five per cent of jobs have a chance of being totally automated. Mass unemployment seems not to be the greater issue here. However, at the same time, forecasts more or less agree that within 60 per cent, 30 per cent can be automated. Mass unemployment will not occur, but for sure severe changes in routine will occur", he said.

- It was further suggested that lifelong learning would be likely required in future labour markets, that the length of university courses could be shortened, particularly as for some technical courses, such as engineering, the skills learned would be obsolete after graduation in many cases.

- Finally, much of the discussion focused on the legislative hurdles that constrain use of data as well as investment in product development and infrastructure. While a new law was intended to come into force in 2020 to protect data user-rights, there are several policies that may incentivize investments and the use of Fourth Industrial Revolution technology on a broader basis.

- **GMIS-UNIDO-ITU Special Session:** Held in conjunction with the International Telecommunication Union, a special session was convened on "Technology and Innovation Powering Connectivity for Inclusive and Sustainable Industrial Development" in ITU Headquarters in Geneva on 1 October 2018. Two expert discussion panels were convened, elaborating on the role of ICT within Industry 4.0 and for Sustainable Smart City and Society (SSCS). One key conclusion was that the wide collection and availability of data, combined with an increased use of AI, allows turning even previously untapped data into valuable information. Data analysis tools and processes are oftentimes open source and available to all, allowing different stakeholders – in particular from developing countries – to make use of the technological developments.

- **GMIS Connect Cairo:** Held in association with American University Cairo (AUC) on 21 March 2019, this event addressed "Industry 4.0: Boosting Employment, Innovation and Competitiveness in Egyptian Manufacturing".

- Delegates cited a number of statistics regarding the position of Egyptian and global manufacturing concerning artificial intelligence, most notably:

- That 50 per cent of all jobs are vulnerable to automation;

- 90 per cent of Americans had lost jobs due to automation in the previous century;

- 75 per cent of jobs were lost between 1950 and 2010;

- By 2030, innovation will replace a share of jobs ranging from 6 per cent in Kenya to 27 per cent in Japan;

- The estimate for Egypt regarding possible automation is 11 per cent of jobs.

- Deeper collaboration was urged between the Government, private industry and organizations such as UNIDO.

- The panel were then asked how Egyptian SMEs could integrate AI into their business models. Some cited the scale of the investment required as the biggest challenge for SMEs in this regard. Pre-requisites were identified for adopting advanced technologies: firstly, that the Government and financial institutions should collaborate to help SMEs, and secondly, that SMEs themselves should take the initiative in terms of adapting their strategies and vision to 4IR.

- The demand for AI in the existing market was noted, but a need was stated for greater training for students and technicians to meet this demand.

- Other delegates noted the high cost to SMEs of absorbing advanced technologies and warned that the gap between developed and developing countries would only widen if this was not mitigated.

- **Second Global Manufacturing and Industrialisation Summit:** Held under the theme of "nature-inspired technologies" in Yekaterinburg, Russian Federation, from 9-11 July 2019 (outcomes book: https://www.gmisummit.com/wp-content/uploads/2020/01/OutcomesBook%20GMIS%202019.pdf).

- High level panel session convened on "Agriculture: Robotics and Artificial Intelligence and the Food Security Challenge".

- UNIDO also convened a special session concerning "Investment Promotion 4.0. What Role for AI?"

- The international community is currently facing an investment gap of $2.5 trillion a year in order to achieve the sustainable development goals 2030. This gap, in addition to the gaps in infrastructure and technological innovation, will only widen once artificial intelligence as well as other technologies of the Fourth Industrial Revolution become more prevalent.

- A new approach is needed to bridge the gaps and UNIDO has come up with Investment Promotion 4.0, which uses machine learning to interpret economic complexity and provide insights for investors, based on their preferences, so they can assess and mitigate risk, using blockchain as an added layer of protection. It also allows SMEs and other UNIDO stakeholders to build and operate businesses around the same technologies.

- UNIDO's ITPOs support technology transfer from industrialised to developing countries, particularly for SMEs. Their main tasks today are raising awareness in developing countries about the rapid changes in the industrialised world, capacity building through educational institutions and the private sector, and identifying investment opportunities.

- Investment Promotion 4.0 should operate more along the lines of a public-private partnership as the private sector is needed to help fill the information gaps about important topics such as cybersecurity.

- Public-private partnerships and technology can be the foundation for developing a circular economy.

- Capacity building is a huge element of readying countries for the Fourth Industrial Revolution, principally through working with educational actors, civil society and the financial sector. The speakers also identified a number of issues to accelerating towards the future of manufacturing, including a lack of professional skills, information gaps regarding investment matchmaking, and a lack of flexibility.

- Greater uptake of digital technologies such as AI, IoT, drones etc. will naturally lead to greater levels of regulation.

- AI is highly useful but not always deployed where necessary at present.

- On Day Three of the Summit, a high level panel was convened concerning "The Artificially Intelligent Manufacturing Sector: The Future of Work, Industry 5.0, Learning and Human Centric Automation".

- The aim of artificial intelligence is to make the uncertain certain by decreasing production deficiencies and freeing people from tedious work. The big challenge is combining AI technology with practical applications because each client has different demands, and this will slow adoption.

- Government, industry and academia will need to work together to address the short-term turmoil brought about by automation, and countries could have to give up the notions of lifelong employment and education happening in the early years of life. Traditional employment models may also need to be rethought to perhaps include flexible working hours, remote working, a shortened business week and a universal basic income.

- Subsequent to the Summit, the GMIS Organising Committee commissioned a research paper on cybersecurity and industrial safety, supported by the Lloyd's Register Foundation. Further information on this is available at the following URL: https://www.lrfoundation.org.uk/en/news/increased-focus-cybersecurity-puts-human-safety-risk/

- **GMIS Connect East Africa:** This regional event from 14-15 November 2019 brought together multi-stakeholder participants from the six EAC Member Countries (United Republic of Tanzania, Rwanda, Uganda, South Sudan, Kenya and Burundi), to elaborate on " Advanced Industrialization in East Africa: Challenges and Opportunities for East Africa". The event was a collaboration between UNIDO; the GMIS Organising Committee; EAC; the East African Science and Technology Commission (EASTECO); and East African Business Council (EABC), supported by BMZ and GIZ of Germany.

- During the "elevator pitch" segment for SMEs to outline their advanced technology innovations, a representative of the Nelson Mandela African Institute for Science and Technology introduced his idea for a PSV anti-drowsiness system. He noted United Nations figures which estimate 1.2 million deaths every year globally due to road accidents, with additional sources estimating that around 57 per cent of these deaths are caused by fatigue, leading to drowsiness.

- He proposed to use artificial intelligence and machine learning to automatically detect driver weariness and to alert them. In his prototype, a target in front of the windscreen of the vehicle monitors the eyes and head motion of the driver/ vehicle owner, who can be alerted via sensors in the seat if the drivers falls asleep.

- Blockchain and artificial intelligence are making an impact on the legal field, and that the legal profession may wish to take a greater interest in these technologies, in terms of training and support of transformative change. It was suggested that taking the time to better understand these new technologies would benefit the legal sector and industry generally.

- **Pursuant to the conference, EAC adopted the Arusha Resolutions on Adoption of Advanced Industrial Technologies in East Africa. This included the following clause:**

- *(a)East Africa's pace in making effective use of its industrialization potential to grow economically and attain most important development goals is slow. For an effective engagement in industrial development that would enable the region not to fall further behind, EAC industry needs to absorb advanced industrial technology, among others technology associated with the fourth industrial revolution (4IR) such as robotics, artificial intelligence, machine learning, fifth-generation wireless technologies, new-generation robotics, blockchain and systemic connectivity big data and automation and the Internet of Things (IoT).*

- **GMIS Connect Southern Africa:** This regional event brought together delegates from the Southern African Development Community (SADC), a 16 country regional bloc, to reflect upon "Advancing Industrialisation in Southern Africa: Think Globally, Act Locally- The Impact of Digital Industrial Transformation in Southern Africa". The event was organized in association with SADC; National Centre for Cleaner Production South Africa (NCPC-SA); BMZ and GIZ.

- It was proposed that SADC country governments should set aside budgetary allocations for the likes of artificial intelligence, Internet of Things, and also research and development.

- During the breakout sessions, it was also said that often private data is not turned over to public bodies, or that public records are still not entirely digitized.

- Participants from French-speaking countries added that a lack of connectivity was raised as a major issue, and it was urged that technology "acts as a facilitator to the work of humans but should not replace them".

- The group also recommended harnessing big data for centralizing data to aid regional pharmaceutical production.

- In terms of the energy sector, it was noted that while 4IR technologies such as the Internet of Things and AI, as well as smart cities, were having a growing influence, there was a "shortage of tangible and feasible planning" on how they would change the lives of citizens of low income countries "beset by unemployment and poverty".