INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)

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Contribution by Egypt

to the CSTD 2021-2022 priority theme on "Industry 4.0 for inclusive development"

Priority Theme 1: Industry 4.0 for Inclusive Development

1- **What are the national Strategies, policies, laws, programmes and initiatives concerning Industry 4.0 in your country?**

Egypt Vision 2030 is a national agenda that reflects the state's long-term strategic plan to achieve sustainable development principles and objectives in all areas. In its third objective, the vision outlined Egypt's ambition to achieve knowledge-based economic growth and digital transformation to increase the resilience and competitiveness of the economy, promote employment, and improve the business environment. The fourth objective acknowledged the value of innovation and scientific research as key pillars to development. Similarly, the National Structural Reform Program (NSRP) that Egypt has recently launched, considers Industry 4.0 as one of its main pillars. The NSRP focuses on expanding the relative weight of three leading sectors: Manufacturing, Agriculture and Communication and Information Technology (ICT).

In 2017, a High-Level Inter-ministerial Committee was formulated to elaborate Egypt's Digital Transformation Strategy. The Committee was tasked with identifying the sectors that benefit the most from science, and technological development, assessing their respective technological gaps and defining the needed interventions.

The Digital Egypt ICT 2030 strategy and the national Artificial Intelligence (AI) strategy developed by the Ministry of Communication and Information Technology (MCIT) guided the upgrade of digital connectivity by mobilizing more than USD 1.6 billion since the mid-2018s to modernize ICT infrastructure, including efforts to replace copper cables with fibre optic ones and investing in 5G infrastructure. It also addressed the regulatory frameworks (E-Payments Law no. 18/2019 and The Personal Data Protection Law in 2020) and supported the establishment of the National Center for Telecommunication Services Quality Monitoring in 2020 to provide detailed reporting on services. The National Telecom Regulatory Authority (NTRA) established a roadmap for investing in Research and Development Programs for techno-regulatory and standardization work in Industry 4.0 that aims to finance joint R&D initiatives and partnerships.

To foster digitalization in firms, the Government of Egypt (GoE) provided start-ups and other businesses with guidance and resources to develop technologies on Industry 4.0, such as labs, testing facilities and co-working spaces in six innovation clusters (Mansoura, Menoufia, Minya, Sohag, Aswan and South Valley (Qena). The Information Technology Development Agency (ITIDA), an agency under MCIT, is in the process of setting up a dedicated Industry 4.0 Competence Centre that can conduct assessments and demonstrate best use cases. NTRA launched challenges for robotics and autonomous vehicle research and has set up a Fintech Fund of Funds of approx. USD 64 million managed by the Central Bank of Egypt. Fiscal incentives of up to 10%-20% of exported value-added digital services were also introduced. The MCIT also provides a full chain of support for ICT-related firms, from seed capital, to incubation services, business consultancies and networking opportunities. Some of this is directed specifically to boost Industry 4.0 technologies, electronics design, Industry 4.0 manufacturing and Internet of Things (IoT) systems. Through the initiative entitled "Our Opportunity is Digital", MCIT is also setting aside at least 10% of public digital transformation projects for SMEs and start-ups, boosting demand.

MCIT has introduced numerous initiatives to increase the availability and financing of training for basic digital skills and advanced courses on information technologies among youth. Egypt now counts with various platforms/initiatives for training in digital skills, such as "Future Work is Digital" (training for web, data, digital marketing for young people), "Next Tech Leaders" (45

advanced digital technologies for students, university staff and professionals), "Mahara-Tech" (training in IT fields for young people) (MCIT/ITIDA/Information Technology Institute -ITI) and occasional private sector partners) and the Internet of Things Academy for training in IoT through Mahara-Tech platform (ITI/ASRT). Advanced training is also offered through the Applied Innovation Center that fosters R&D and skills development through international partnerships in Artificial Intelligence, the Initiative to train trainers for digital technology (managed by the National Telecommunication Institute and Huawei) and the Advanced Training Centre for automation, IoT and other Industry 4.0 technologies which offers vocational training (Siemens and MTI). A digital platform was established by MSMEDA in 2018 to facilitate information sharing on the various services (e.g. financing and training) provided to MSMEs.

2- **What are the industries that are pioneering industry 4.0 innovation in the country? List the key actors in the national ecosystem of innovation related to Industry 4.0 in your country (firms, universities, financial institutions, regulators) What are the key networks of the ecosystem in your country (including online networks, innovation hubs, etc..)?**
The strategy aims to accelerate the pace of digitalization as a vehicle for development. It seeks to increase the ICT's share of GDP, enhance Egypt's export capacities from outsourcing services, and create new job opportunities. This will be particularly manifested in the manufacturing and agricultural sectors. Automation and digital solutions will be promoted in the engineering, textiles, food, agri-business and pharmaceutical industries, in addition to agricultural applications. The digitalization of the finance and energy sectors are also highlighted as important enablers to facilitate transition to Industry 4.0 in Egypt.

3- **What are the challenges that your Government have faced or may face for promoting industry 4.0 in your country to contribute to national priorities and accelerate the progress towards the SDGs?**

Governance: Egypt has a quite complex governance structure which calls for coordination at the top level for strategy definition. While coordination at the inter-ministerial level was successful, bringing the private sector in as a key partner in policy elaboration and implementation is still lagging behind.

Standardization: The transition to Industry 4.0 relies on the unprecedented integration of technologies and systems across different domains. As a result, quality infrastructure also needs to respond to a large number of technologies, scientific areas and stakeholders. Some collaboration between ministries have started to develop technological standards. However, there is still untapped potential in developing synergies and joint work between the different stakeholders

Mobilizing resources: Enabling the shift from traditional manufacturing to Industry 4.0 requires commitment to invest by both private and public sectors. The GoE has been investing large resources to shape the future, to create the hard and soft infrastructure necessary for Industry 4.0, building skills and reducing risks for firms experimenting with new technologies. At firm-level, surveys showed reluctance in investing in digitalization. On average, firms invest 3% of their revenue in digital operations, with the Chemical firms investing the highest (4.9%), while food and ICT firms lagged behind (1.6% and 1.7% respectively). Investment also varies by firm size,

albeit this could be a reflection in the base of revenues. Large firms invested (1.4%) of their revenues, compared to medium (4.5%) and small firms (4.9%).

Developing the policy mix: Egypt's approach to Industry 4.0 relies on setting up targeted incentives for firms to create and adopt Industry 4.0 technologies. The high focus on start-up development, particularly in ICT areas can be complemented with extending support to other types of firms for a wider adoption of Industry 4.0 among Egypt's industrial players. The function of the Industry 4.0 Competence Centre could be boosted by enabling partnerships with other sources of knowledge and expertise in the local and international ecosystem.

Sustaining the Talent pool: Egypt is the second country in the continent for software talent pool accounting for 0.2% of global talents, and 15% of talents in Africa (following South Africa). However, Egypt's talent pool is highly below its potential with 8 Users per 1 million people compared to 26 in South Africa. Moreover, much of the talent that leaves Egypt is specialised in "disruptive" skills that are key for Industry 4.0, such as artificial intelligence, and other tech skills, such as mobile design and hardware engineering. The OECD report on Production Transformation Policy Review estimated the net loss at 221 people per 10 000 in disruptive tech skills during 2017-19.

4- **What should Governments, private sector, labor unions and other stakeholders do so that developing countries can benefit from these technologies?**
Egypt would benefit from creating institutional spaces or mechanisms that can bring together all the relevant partners to develop a common vision for Industry 4.0 and co-ordinate its implementation. Hence, interventions should enable the emergence of an Industry 4.0 innovation ecosystem by linking academia and the private sector but also manufacturing and the digital/ICT sector. This ecosystem should be conducive to the development of a quality infrastructure for Industry 4.0. International partnerships are key to mobilize resources and provide technical assistance on tools to vary the current policy mix and incentivize Industry 4.0 adoption at firm level , as well as, retaining and developing talent .

5- **What actions can International community, including CSTD, TAKE TO HELP YOUR COUNTRY TAKE ADVANTAGE OF Industry 4.0 for inclusive and Sustainable Development?**
The UN was the first to shed light on the link between Industry 4.0 and the SDGs. The involvement of the international community at large is key to mapping Industry 4.0 initiatives and applications in various countries. Multilateral forums such as the CSTD can focus discussions on industry 4.0 standards and develop the markers of its progress. It can also mobilize resources for science and technology needed to speed industry 4.0 implementation.
Finally, the CSTD can play a pivotal role in the dissemination of knowledge and best practices, establishing partnerships and sharing knowledge on success stories in a variety of development contexts for the benefit of all Member States.

6- **Could you suggest some contact persons in the national agency responsible for projects/ policies and international collaboration in this context, as well as, any experts (from Academia, private sector, civil society or government) dealing with projects in this area? We**

might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual panel.

Suggested contacts from :
Ministry of Planning and Economic Development (MPED):
Dr. Cherine Khallaf – Head of Central Department for Trade and Industry
Cherine.khallaf@mped.gov.eg

Ministry of Communication and Information Technology (MCIT):

Ministry of Trade and Industry :
Eng. Mohamed Abdel Karim – Executive Director of the Industrial Modernization Center
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Private sector: Dr. Sherine Mossalam- Symbios Consulting **(https://symbios-consulting.com/)**

7- **Do you have any documents, references, technological assessments, future studies or reports on the priority theme in your country or region?**

Suggested Reports:
OECD - Production Transformation Policy Review (PTPR)
https://www.oecd-ilibrary.org/docserver/302fec4b-en.pdf?expires=1630937670&id=id&accname=guest&checksum=BC3F995EE8A63EE15A4F8E352E71306A

UNIDO – Program for Country Partnership (PCP)
https://open.unido.org/api/documents/21128423/download/PCP_Egypt_PD%20validated_final.pdf

Report by Data Reportal: Digital 2021: Egypt available on
https://datareportal.com/reports/digital-2021-egypt