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**Submissions from entities in the United Nations system, international
organizations and other stakeholders on their efforts in 2022 to
implement the outcomes of the WSIS**

Submission by

United Nations Industrial Development Organization

This submission was prepared as an input to the report of the UN Secretary-General on "Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels" (to the 26th session of the CSTD), in response to the request by the Economic and Social Council, in its resolution 2006/46, to the UN Secretary-General to inform the Commission on Science and Technology for Development on the implementation of the outcomes of the WSIS as part of his annual reporting to the Commission.

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World Summit on the Information Society

UNIDO Reporting on activities related to WSIS Outcomes

As of 25 October 2022

Executive Summary

UNIDO supports the uptake of digital transformation and frontier technologies in developing countries and implements capacity-building measures to ensure the uptake of new technologies can be made and an enabling environment for them to flourish is in place. UNIDO builds partnerships across the UN-system as well as with leading private sector companies that provide the technologies that drive this transformation, like Artificial Intelligence and other enabling technologies.

A major element that has seen increased attention is cybersecurity. Safety of physical infrastructure is increasingly determined by the level of cybersecurity infrastructure providers can ensure. Therefore, UNIDO has looked to improve Industrial Safety, and highlight the impact of cybersecurity for operational technologies in manufacturing sites, as well as in critical infrastructure. The economic damage caused by cybersecurity incidents increases annually, and steps need to be undertaken to strengthen frameworks for cybersecurity.

Member states also increasingly look to UNIDO to support the development of national AI Strategies, which are seen as a prerequisite to ensure widespread application, which is safe, secure and inclusive, by design. Holistic approaches to AI can only be achieved on government level, which makes it ever more important to support the development of national AI strategies, identify key players, the most vulnerable and make sure that exchange takes place, both on a technology, financial, and access level.

Such exercises face bottlenecks in countries and efforts are increased to support programmes aimed at improving the climate in which all stakeholders will be thoroughly involved in any consultation processes, including MSMEs which may not be the primary user, but could face negative consequences if, e.g., AI bias isn't properly addressed and mitigation measures are in place or planned.

Analysis of trends and experiences

The Digital Transformation is a major trend that has triggered a productive transformation that bears potential for increasing efficiency, making production and products more sustainable, but also challenges current development pathways. Technologies furthering the Digital Transformation, particularly Artificial Intelligence, risks the perpetuation of current bias and inequality. Strategies and actions to foster this transformation must consider the limiting factors, such as the digital divide and digital gender gap. Some developing countries show promise in regards to the adoption of new technologies in the form of leapfrogging. Mobile payments in Africa, artificial intelligence research in China's smart cities or additive manufacturing in South East Asia and other countries show that there are opportunities for developing countries in the digital transformation process. Coherent, concrete strategies and resources dedicated to that cause allow countries to achieve promising results on the cutting edge of technological development. UNIDO has been cooperating closely with its Member States and other partners to bring this vision to fruition, and during its recent restructuring, a Division for Digital Transformation and AI Strategies has been established to respond to the challenges, as well as provide solutions that will contribute to the SDGs through progress by innovation



The digital transformation and Artificial Intelligence also continue to present some downside risks, including, but not limited to: automation of industrial plants and infrastructures; reshoring of foreign direct investment from developing countries; threats to cybersecurity and data protection; perpetuation of inequalities through AI-enabled algorithms; and a widening of the digital divide between high-income countries and low and middle-income countries

Enhancing innovation ecosystems is also central to these efforts, at the national, regional and global levels. This endeavour can be assisted principally by providing mapping and measurement, evidence-based advice and development of relevant indicators. Micro-, small and medium-sized enterprises (MSMEs), start-ups, multinationals, government and regulatory bodies, and academia are at the core of this endeavour. The work of the UNIDO field presence is essential in this regard, particularly the network of Investment and Technology Promotion Offices.

Artificial Intelligence will be one of the key elements in the Digital Transformation and UNIDO will pay attention to increase support to Member States looking to capitalize from developments surrounding AI and the Digital Transformation. More technical demonstration work will be conducted and (national) strategies fostering AI development will continue to be supported as a tool to harness the benefits of these technologies

C4 Capacity Building

Digital Transformation, AI and other frontier technologies are the base to implement UNIDO's work propelling industrial development which comes from the integration of productive activities, comprising manufacturing, services, and the digital economy. Note that in the new economy the frontier between manufacturing, services and digital, are complex and combined. Manufacturing rely on services sectors such as finance and consulting, and requires to use and take advantage of digital platforms, which are also a service sectors. This taxonomy of productive activities is in progress and not definitive, but it is useful to locate UNIDO's focus.

Building an international alliance to harness AI for industry is critical for ensuring technology transfer across the globe. AI development is currently concentrated in a few countries and only a few main technology drivers.

Digital twinning and other industry 4.0 tools to streamline product optimization are the main elements UNIDO demonstrates in the automotive value chain in Colombia. Under the guidance of project experts and with the help of new advanced digital tools, automotive component manufacturers can turn their attention not new products and software solutions that further increases their efficiency. Looking for alternatives for alternatives to the big software providers on the market can also make certain technological solutions available to MSMEs, which are often too small to cover the costs of enterprise software solutions.

Artificial Intelligence (AI), Machine Learning (ML), Big Data and Remote-Sensing based on satellite- and drone-imagery technologies have also been leveraged in Namibia to combat invasive species and thus improve food security. UNIDO has utilized satellite imagery to allow advanced AI and ML algorithms to detect invasive acacia bush species with very high precision, enabling yield predicting for farmers and pinpointing where harvesters can find the bushes and cut them. By automatically identifying and locating invasive species, the project enables the harvesting of these plants to be transformed into animal fodder and charcoal for energy creating a digital-circular economy in the sector. In addition, UNIDO is testing the



use of UAVs and Drones and intelligent sensors for precision farming to analyze the health status of the soil in terms of humidity, salinity and status of fertilization.

An innovative model developed by UNIDO, including Artificial Intelligence is being implemented under the Blue Economy component of the SwitchMed programme to support Mediterranean aquaculture transition towards sustainable and circular practices. Artificial Intelligence enables the optimization of the FCR (Feed Conversion Ratio), a key parameter for resource-efficient aquaculture. Combined with underwater 360° cameras, the IA analyses real-time fish behavior, satiety and automatically detects free pellets to provide start/stop inputs signals to automatic feeders and optimize feed rations. This system is design for sustainable fish growth that increases the profitability of the aquafarm while reducing the dispersion of exogenic substances in marine ecosystems.

C6 Enabling Environment

Countries that adopt sound and comprehensive strategies on digital transformation technologies in general and Artificial Intelligence in particular will enjoy the benefits of a holistic and all-encompassing approach that ensures wide application, as well as the removal of obstacles and bottlenecks related to commercial AI applications, as well as any other applications of AI.

Moreover, some groups continue to face greater obstacles in accessing digital manufacturing and its positive spillover effects, including women, youth and migrants as well as small and medium-sized enterprises (SMEs). The potential transformative effect of frontier technologies will be rendered insufficient if social exclusion persists. Policy efforts to disseminate frontier technologies for ISID must place people at the front and center.

Successfully crafting a national AI strategy requires the consultation of many stakeholders – public and private – as well as ensuring concerns are heeded and addressed. The consultation process should include consultations with representatives of the main stakeholders (public and private sector actors and development partners); discussions with private entities (the latter with a view to get real life examples of opportunities and challenges faced in the area of AI); documents review (official Government documents, documents prepared by UNIDO and by other development partners), research articles and papers).

Absorption capacities for digital transformation technology also vary by industry and even by enterprise, and consequently the maturity and readiness for adoption and diffusion will differ for different technologies. Generic models for assessing maturity and readiness for adoption and diffusion of digital transformation and AI technologies may be useful as a general framework but will require testing for their usefulness for implementation on the ground. Industry maturity and readiness approaches need to be tailored to individual industrial sectors and on the macro level to specific country contexts.

Multidisciplinary teams can create pilot projects that address aspects of readiness and maturity for specific industries: horizontal, vertical integration, and end-to-end integration; data quality protection; relevant technologies; industrial safety, security and suitability; inclusiveness of stakeholders, such as suppliers, customers, research institutions, workers and managers; human skills; cultural aspects; strategies and policies; and sectoral innovation systems. Research needs to test the usefulness of these models for diagnostics, road mapping and roadmap implementation. The same holds at the enterprise level. One example of enterprise readiness indexes is the Asian Productivity Organization initiative on designing Smart Industry Readiness Index.



Despite many larger firms moving to digitalize their production, SMEs often perceive limited use of such technologies. Further, the sentiment of not being able to or not having the financial capabilities to successfully digitally transform inhibits the benefits from reaching more companies across the globe. Showcasing the readiness to companies with a clear upgrade path and showing use cases for each individual case could therefore support furthering the digital transformation in all regions of the world.

On Digital Transformation, 4IR and Artificial Intelligence. UNIDO is implementing a project in Tunisia and Cote D'Ivoire on Industry 4.0 whose main objective is to advance the transformation of the productive sectors in both countries to increase productivity, competitiveness, and contribute to youth employment with a focus on the gender dimension. The project will generate 1300 jobs in Tunisia and 200 in Cote D'Ivoire out of which 30% women and 50% youth. Additionally, 110 enterprises from both countries are expected to enhance performance due to adoption of I4.0 technologies. The project will ensure the sustainability of its impact through supporting the establishment of a Smart Factory, and strengthening the different institutions (academic, vocational) in enhancing the needed skills and approached related to I4.0. UNIDO supported the Jordanian government draft and implement a national AI Strategy, in partnership with the EU Delegation, and the Ministry of Digital Economy and Entrepreneurship of Jordan. Further, UNIDO also provides tools for assessing readiness of sectors / governments for adopting digital transformation technologies, including AI. There have been different methodologies tested at UNIDO to enable tailor made approaches to digital transformation and AI in sectors / countries.

Strengthening innovation eco-systems is a key aspect to advance the uptake of modern ICT technologies. An ongoing project aimed at improving the business environment for innovative and modern enterprises is being conducted in Cabo Verde, where a National System of Innovation survey mapped and measured the Cabo Verde National System of Innovation.

AI ecosystems will proliferate into commercial applications as well, where there is huge potential to increase productivity through the combination of technologies. Design, quality control are just two of many potential areas of application of AI in a production process and where AI is already in active use across the globe. Spreading the benefits of such technologies to the wider social and economic development discourse will only support countries' pursue of inclusive and sustainable industrial development in the era of digital transformation. By accelerating economic development through AI applications, economies will improve their innovation and entrepreneurship capabilities and provide dynamic and innovative solutions to the challenges countries face today.

Digital Transformation and Artificial Intelligence are the defining forces and are determinants of competitiveness. As such, UNIDO will ensure that Member States can harness the benefits of such technologies, and will support to overcome the digital divide, and other technological inequalities that persist in the current international economic system. This work will cover all aspects in which frontier technologies and AI can play an important role to provide social, economic and environmental benefits. All efforts must ensure that these technologies are used in an inclusive, participatory and holistic manner.