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**Submissions from entities in the United Nations system, international
organizations and other stakeholders on their efforts in 2023 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 27th 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

Executive Summary

UNIDO supports Member States to adopt digital transformation technologies through capacity building to ensure that new technologies can be implemented and provides policy and institutional advice to promote an enabling environment. UNIDO partners with other UN agencies and leading private sector companies to ensure that policies are reflecting inclusiveness, development addresses current inequality patterns, and ensures that technologies driving the digital transformation, and artificial intelligence (AI) can be absorbed by people in developing countries. All efforts under “progress by innovation” supports the improvement of food security, makes economic activity environmentally friendly and make supply chains more sustainable.

AI and digital transformation have the potential to address global challenges and serve as a competitive advantage, but only if they are harnessed responsibly and the digital divide between industrialized and developing countries is effectively addressed. Some manufacturing applications of AI are still in their experimental stages, but large language models (LLMs) are seeing increasing applications¹. Investment in science, technology and innovation as well as related eco-systems is essential for developing countries to benefit from AI².

The United Nations system must play a leading role in ensuring effective global governance, setting norms and promoting knowledge and technology transfer. Small and medium-sized enterprises (SMEs) in developing nations need to be aware of the potential offered by digital tools and have access to global and regional technological resources.

In July 2023, UNIDO launched an international alliance to harness AI for industry, which will act as a global platform to enable public-private discussions, facilitate the transfer of technology and knowledge and create an environment for the responsible and ethical use of AI in manufacturing. The alliance is open for any interested parties which will uphold the principle of ethical use of AI and the next step will be to hold regional AI in manufacturing forums to get the best regional approaches, best practice public actors and academia. This approach can help developing countries and economies in transition to accelerate their development efforts.

Analysis of trends and experiences

Artificial intelligence and digital transformation have the potential to address global challenges, including climate change, environmental deterioration, energy conservation, food production and

¹ <https://arxiv.org/pdf/2303.10130.pdf>

² <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2023-generative-ai-breakout-year>

bridging urban-rural gaps³. While certain jobs may become obsolete, AI will simultaneously generate fresh employment opportunities⁴ demanding both decision-making acumen and creativity⁵. If harnessed appropriately, these emerging technologies can serve as a competitive advantage and play a role in reducing inequality while advancing the fulfilment of the Sustainable Development Goals (SDGs). AI has seen mainstream attention with the introduction of LLM-based systems. All major tech companies have released consumer products with AI integration.

Manufacturing application of AI on the other hand has not followed at the same pace as consumer-facing products, mostly because of the experimental and untested nature of those technologies. It stands to be decided whether LLMs will even play a big role in manufacturing, where machine learning tends to provide much greater promise and has been the centre of attention for a few years now. However, LLMs still see increasing applications in manufacturing, particularly in organizing unstructured data that is the result of machines providing telemetry, sensors, images, etc.

Inclusive AI becomes an ever more pressing concern for ensuring that all parts of the globe equally benefit from AI. Investment in science, technology and innovation has been a cause of concern for various regions on the globe and income groups, particularly least developed countries (LDC) struggle to keep up with the constantly growing pace of innovation. The recent developments of AI expose this problem more dramatically.

Early adopters of digital transformation and AI technologies tend to outcompete non-adopters by growing margins⁶. Responsible use, adoption and proliferation of AI thus become more important. The United Nations system could play a leading role not only in ensuring an effective global governance structure and setting norms when it comes to the use of AI but also to promoting knowledge and technology transfer for productive use and enhanced competitiveness. Growing complexity and cost of innovation make it harder for small and medium-sized enterprises to benefit from cutting-edge technology, yet their benefits may far outweigh initial costs.

As artificial intelligence continues to advance, it becomes increasingly important to grasp its potential and its ability to enhance the productivity of businesses. Therefore, it is imperative to ensure that SMEs in developing nations are well-informed about the possibilities offered by digital tools and have access to both global and regional technological resources. Failing to accomplish this could exacerbate the divide in AI adoption between industrialized and developing countries. In turn, the inability to absorb advancements based on fundamental research and scientific breakthroughs may be attributed to underdeveloped ecosystems and ineffective innovation policies.

³ <https://www.datadynamicsinc.com/blog-ai-in-energy-your-data-is-the-game-changer-7-reasons-why/> ; https://www.researchgate.net/publication/366226821_Principles_of_Management_Systems_for_Positive_Impact_Factories

⁴ <https://www.weforum.org/agenda/2023/09/how-to-harness-the-power-of-generative-ai-for-better-jobs/#:~:text=The%20World%20Economic%20Forum's%20Future,it%20to%20drive%20job%20displacement>

⁵ https://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_Generative_AI_2023.pdf

⁶ E.g. here <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-rewired-enterprise-how-five-companies-built-to-outcompete> and here <https://hbr.org/2023/07/the-value-of-digital-transformation>

While the primary sectors in numerous developing nations, notably agriculture, mining and fishing, are often perceived as lacking sophistication, they hold the promise of growth when integrated with new technologies. As an illustrative case, Namibia has embraced satellite imagery technology to combat invasive species⁷, thereby enhancing food security. Additionally, AI can serve as a valuable tool for farmers in predicting crop yields⁸. In the mining sector, Chile's prominent copper producer, Codelco, has elevated its production levels by incorporating robotics, AI and big data, resulting in enhanced cybersecurity measures and procurement processes, ultimately driving efficiency gains⁹.

C3 Access to information and knowledge

UNIDO is helping governments and businesses work together by developing portals that provide one-stop access to information on regulations, support resources and business advice. These portals are especially useful for potential entrepreneurs and small businesses. Knowledge hubs, excellence centres and similar services are important elements to provide access to information for SMEs and startups. Innovation activity inherently depends on the ease of access to information and knowledge for all its actors, so open innovation models and approaches are favoured wherever possible in UNIDO's projects.

Development Dialogues on AI and Digital Transformation proved to be a highly requested tool for UNIDO to keep Member States updated on trends in UNIDO's project portfolio. Subject matter experts then prepare status reports and outlook that form parts of UNIDO's technological foresight. Applying the knowledge accumulated across the globe and condensing it to such collaborative formats can further proliferate best practices and also ensure an internationally validated pool of knowledge and expertise, that is continuously expanding and made available to interested stakeholders through UNIDO's knowledge hubs. More platforms dedicated to AI, machine learning and digital transformation are needed and ongoing efforts are underway to build regional centres of manufacturing excellence, which will serve as hubs for access to information, knowledge and technology.

UNIDO actively promotes the development of standards and principles to ensure access to information, knowledge and technology across the globe. In the field of the digital transformation, it is important to ensure that standards are not used in an exclusionary manner, but ensure interoperability, openness and trustworthiness between actors¹⁰. The ever rapidly evolving technological landscape make it almost impossible to govern all aspects of technologies and there may be several standards governing one piece of technology. Ensuring that products and services are still fulfilling requirements makes a strong case for new models for certification and standards.

⁷ https://www.unido.org/sites/default/files/2017-10/NAMIBIA_Brochure_1.pdf ;
<https://sdgs.un.org/sites/default/files/2022-10/UNIDO%20Cases-%20Aleksi.pdf>

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<https://www.sciencedirect.com/science/article/pii/S0168169920302301#:~:text=Machine%20learning%2C%20which%20is%20a,and%20discover%20knowledge%20from%20datasets>.

⁹ <https://www.bloomberg.com/news/articles/2022-08-12/codelco-turns-to-ai-to-squeeze-out-more-copper-from-aging-mines?embedded-checkout=true>

¹⁰ <https://www.unido.org/sites/default/files/files/2021-12/Standards.pdf>



To this end, UNIDO has proposed new mechanisms at the UN system to facilitate certification – which is critical for trade in many regions – and new discussions on standards for the digital transformation¹¹.

C4 Capacity Building

UNIDO's core principle in its activities is to ensure that capacities are built to change behavior and have a lasting impact. Behavioral change is becoming ever more important in a world of fast changing technologies that require new skills, thinking and approaches; and with narrowing windows of opportunities to steer away from dangerous climate change, while navigating several other ongoing crises capacities to innovate are crucial. While technical skills are the focus of technical cooperation projects, policy advice and the ability to develop evidence-based policies requires the attention of the public sector, usually government institutions or ministries.

There are ongoing UNIDO projects in the digital transformation and fourth industrial revolution in Tunisia, specifically targeted at youth and disadvantaged groups. Bridging the digital divide is key, as well as the digital gender gap – both of which need urgent attention to ensure the digital transformation is not a self-serving transformation but serves the economic transformation for everyone.

Digital Transformation, AI and other frontier technologies are the base for implementing 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 is complex and combined. Manufacturing relies on service sectors such as finance and consulting and requires using and taking advantage of digital platforms, which are also service sectors. This taxonomy of productive activities is in progress and not definitive, but it is useful to locate UNIDO's focus.

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 to new products and software solutions that further increase their efficiency. Looking for alternatives to the big software providers on the market can also make certain technological solutions available to micro-, small and medium-sized enterprises (MSME), which are often too small to cover the costs of enterprise software solutions.

C6 Enabling Environment

Countries that implement well-structured and comprehensive strategies concerning digital transformation technologies stand to reap the advantages of an inclusive and thorough approach. Such an approach facilitates the digital transformation and mitigates impediments and constraints pertaining not only to commercial AI applications but also to various other applications within the realm of the digital transformation.

¹¹ <https://open.unido.org/projects/M0/projects/230007>

To craft a successful national AI strategy, it is essential to engage various stakeholders, including public and private sectors and address their concerns. UNIDO supports the process through mediating interest between industry associations, Government institutions, business needs and connects with academic institutions to ensure a holistic process. In various rounds of deliberations at the national level, regional level and sometimes even at individual cities, the voices and concerns on AI were heeded and considered in the strategy.

Moreover, the readiness for adopting digital transformation technologies varies across industries and enterprises. While generic models can provide a framework for assessing readiness, they need customization to specific sectors and country contexts. Multidisciplinary teams can develop pilot projects to address readiness factors such as integration, data quality, safety, inclusiveness, skills, culture and policies. Testing the effectiveness of these models is crucial, both at the industry and enterprise levels. For instance, the Asian Productivity Organization has initiated the Smart Industry Readiness Index as an example of an enterprise readiness measure. Likewise, UNIDO has developed maturity and readiness assessments for the digital transformation and is now working with partners to ensure these models' relevance for AI.

A critical element to improving the business environments in developing countries is to foster collaboration between public and private sectors. Ensuring that will create supportive policy environments, channel investments in digital infrastructure and education to bolster digital literacy and promote innovation and entrepreneurship. Additionally, international partnerships and knowledge sharing can play a vital role in providing resources, expertise and best practices to facilitate technology adoption and adaptation to local contexts.

An enabling environment has to overcome divides and particularly gender gaps. To highlight the issues, particularly in this technology intensive development era, UNIDO has published the report on Gender and Digital Divide, the report describes key areas of action and shared approaches and features case studies of initiatives, from international organizations funding research to understand gender gaps in technology fields, and development banks supporting women-led businesses, to academic institutions and the private sector collaborating in skills development, and civil society organizations supporting the digital inclusion of marginalized groups.

In the past, UNIDO has supported countries in their pursuit of sustainable industrial development by facilitating the exchange in a variety of sectors and on multiple levels. For instance, UNIDO supported the Jordanian government in drafting and implementing 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 the readiness of sectors and governments for adopting digital transformation technologies and AI. There have been different methodologies tested at UNIDO to enable tailor-made approaches to digital transformation and AI. Strengthening innovation ecosystems 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.



Digital transformation and artificial intelligence are the defining forces of our time and key drivers of competitiveness. UNIDO is committed to ensuring that all member states can harness the benefits of these technologies, overcome the digital divide and reduce other technological inequalities. This work will cover all aspects of frontier technologies and AI, from their potential to drive social, economic and environmental benefits to the need to use them in an inclusive, participatory and holistic manner.