UNIDO and the Global Manufacturing and Industrialisation Summit

PROGRESS BY INNOVATION
WHAT IS THE FOURTH INDUSTRIAL REVOLUTION?

Throughout modern history, industrialization has proven an unrivalled strategy for defeating poverty, upscaling social mobility, and transforming societies. The First Industrial Revolution, originating in the eighteenth and early nineteenth centuries, heralded a rapid transition from man and animal power to modern industrial machinery utilizing steam, propelling the rapid urbanization of society. The Second Industrial Revolution, occurring in the late nineteenth and early twentieth centuries, saw the onset of electrification and early mass transport and communication systems, and set in train the first labour movements, mass consumerism, social welfare protections and mass enfranchisement. The Third Industrial Revolution, which took place in the late twentieth century, saw a progression from analogue to digital technologies, and saw the birth of computerization and the rapid growth of a number of economies, most notably in East Asia.

In the early decades of the twenty-first century, modern innovations such as advanced robotics, the Internet of Things (IoT), artificial intelligence (AI), big data, automated vehicles and Fifth Generation Mobile (5G), inter alia, are disrupting the global industrial landscape, possessing enormous potential to add value to the global economy, enhance industrial efficiency and productivity; to promote a circular economy, enhance energy sustainability and to improve resource management; and to create new jobs and new industrial sectors.

This convergence of traditional manufacturing and digital production has given rise to a new concept: the Fourth Industrial Revolution. This new era contains both enormous potential to enhance economies and societies worldwide, but also harbours a number of downside risks, e.g. the prospect of a widening of the digital divide; reshoring of labour-intensive industries; and risks to data protection and automation of labour inter alia. UNIDO’s Industrial Development Report (IDR) 2020 outlined the deep disparities that currently exist on the advanced manufacturing landscape, with just ten economies accounting for over 90 per cent of advanced innovation patents and some 70 per cent of associated exports, while 88 developing country economies play little or no meaningful role in the high-technology sector.

A phenomenon with truly global implications and challenges requires a globally inclusive political process in order to untangle the hidden potential and to navigate the inherent risks. The Global Manufacturing and Industrialisation Summit (GMIS) aims to bridge this divide.

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WHY GMIS?

Given this period of rapid industrial transition, it was clear that a new platform was required, to address the challenges and capture the potential of this digital transformation, in line with the United Nations Industrial Development Organization’s (UNIDO) mandate of inclusive and sustainable industrial development and the adoption of the Sustainable Development Goals (SDG) framework. To this end, GMIS was established by UNIDO and the Ministry of Industry and Advanced Technology of the United Arab Emirates.

GMIS convenes high-level representatives from national governments and international organizations; the worldwide private sector; academia and think tanks; and civil society, to progress digital transformation through multi-stakeholder discussion, partnerships and action.

From humble beginnings as a standalone summit in 2017, the initiative has grown to include a number of local and regional events (GMIS Connect); online webinars (GMIS Digital Series); and a number of legacy initiatives and partnerships, with several future plans to be elaborated. GMIS can thus facilitate the achievement of UNIDO’s motto of Progress by innovation.

GMIS MILESTONES

KEY MESSAGES ABOUT GMIS

DR. GERO MÜLLER
UNIDO Director General

“ Forums such as GMIS can help us bridge the gap between dialogue and action. I hope that we will move forward together towards progress by innovation.”

H.E. DR. SULTAN BIN AHMED AL JABER
Minister of Industry and Advanced Technology, United Arab Emirates

“We should build public-private partnerships to manage risk collectively so that we can better deal with potential future disruptions. All these efforts and cutting edge technologies can give us the edge and the differentiator we all need. This is where GMIS has a critical, and then important role to play.”
How the Fourth Industrial Revolution Enables the Achievement of the SDGs

**SDG 1: ERADICATING POVERTY**
Enhanced productivity, increased revenues and tax take; further global value chain integration.

**SDG 2: ZERO HUNGER**
Blockchain for assessing crop yields, animal feed, pest control; satellite technology to fight invasive species.

**SDG 3: GOOD HEALTH**
Telemedicine; remote transport of organs and medicines; nanotechnologies for cancer treatments and DNA analysis; AI for contact tracing.

**SDG 4: QUALITY EDUCATION**
Digital platforms for remote training and distance learning; Information and Communication Technologies (ICT) as enabler for more learning opportunities.

**SDG 5: GENDER EQUALITY**
Digital solutions for combating gender-based violence; sensitive AI algorithms address systemic gender biases.

**SDG 6: CLEAN WATER AND SANITATION**
Sensors address water quality and sanitation; satellites can identify unknown aquifers in water-stressed locations; IoT for identifying flood risks.

**SDG 7: AFFORDABLE AND CLEAN ENERGY**
Green hydrogen; smart public transport and infrastructure; smart construction; smart factories and microgrids.

**SDG 8: DECENT WORK AND ECONOMIC GROWTH**
Digital platforms for remote work; IoT and AI enable better industrial safety; smart factories reduce exposure to carbon emissions.

**SDG 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE**
Increased industrial efficiency and productivity; reduced industrial emissions; improved industrial safety; enhanced integration of value chains and investment opportunities.

**SDG 10: REDUCED INEQUALITIES**
Digital work platforms/AI combating rural depopulation; smart mobility; creation of new job opportunities; greater control over individual data.

**SDG 11: SUSTAINABLE CITIES AND COMMUNITIES**
Smart cities; smart infrastructure; smart transport; provision of cheap and durable housing materials through 3D printing.

**SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION**
Circular economy approach to production reduces waste, carbon emissions, energy footprint of industry.

**SDG 13: CLIMATE ACTION**
Decarbonization of industry; IoT and advanced robotics allow for smart waste collection and management; AI enables early warning systems against natural disasters.

**SDG 14: LIFE BELOW WATER**
4IR powers the "blue economy", e.g., autonomous shipping; underwater robots to monitor oceans and biodiversity; satellite technology to monitor fish stocks.

**SDG 15: LIFE ON LAND**
Nature-inspired innovation reduces land change; AI to measure and combat deforestation; IoT for wildlife tracking, conservation monitoring; digital databases enable superior monitoring of biodiversity changes.

**SDG 16: PEACE, JUSTICE AND STRONG INSTITUTIONS**
Blockchain can enable greater transparency of data and better resources for researchers and investigative journalists; AI, IoT can improve facial recognition for combating crime; improved capacities for forensic science.

**SDG 17: PARTNERSHIPS FOR THE GOALS**
Additional financial streams, research, capacity building ventures allow for dispersion of the Fourth Industrial Revolution (4IR) into developing countries.

**Background to the Global Manufacturing and Industrialisation Summit (GMIS)**

UNIDO and the Global Manufacturing and Industrialisation Summit: Progress by Innovation
GMIS is not just a Summit or a series of events, but an initiative aiming to elaborate a pathway towards an inclusive and sustainable digital transformation. Central to these aims is the inclusion of developing countries, which make up the majority of the world’s sovereign states, but which are largely trailing behind the front runner countries in terms of advanced digital production technologies. GMIS aims to address this disparity, in the long-term, through facilitating multi-stakeholder partnerships, partnership and actions. For instance, the Mohammed Bin Rashid (MBR) Initiative annually gathers thousands of submissions from technologists, innovators and entrepreneurs worldwide, with the aim of addressing global development issues and challenges.

Likewise, environmental and social sustainability are imperative to the GMIS initiative, which utilizes a gender mainstreaming approach, aiming to leverage the full contribution of women to digital transformation. This is especially important given that women continue to be under-represented in the Science, Technology, Engineering and Mathematics sectors which underpin the Fourth Industrial Revolution globally.

It is also vital to address some of the thematic offshoots of advanced manufacturing. For instance, there is immense potential for new innovations to address industrial and occupational safety, through digital mapping, remote monitoring, AI-enabled tracking of CO2 and other particulates in the workplace, etc. However, at present there are an estimated 3 million preventable deaths in industrial workplaces worldwide, according to the International Labour Organization. The Global Initiative for Industrial Safety (GIFIS) proposes to address such issues through bringing together national regulators, private sector technology providers, policymakers, academic experts inter alia. The principal intended outputs of GIFIS are appropriate policy measures, such as the forthcoming GIFIS Manifesto; the establishment of communities of practice; providing a platform for global action; and associated technical cooperation initiatives.

GMIS can also act as a global conduit for establishing new partnerships in the era of rapid digital transformation, as well as enhancing knowledge and strengthening research. The GMIS Working Group on Inclusive and Sustainable Industrial Performance is working towards the elaboration of a dedicated index, aiming to enhance environmental, social and corporate governance in the realm of advanced digital production technologies.
Map of GMIS Events, 2016-2022

- **2016**: GMIS Connect - Madrid, Spain
- **2017**: GMIS Connect - Warsaw, Poland
- **2018**: GMIS Connect - Tokyo, Japan
- **2019**: Summit - Yekaterinburg, Russian Federation
- **2020**: GMIS Connect - Cairo, Egypt
- **2021**: Digital Series - Latin America
- **2022**: Summit - Pittsburg, United States

The Map of GMIS Events, 2016-2022, illustrates the locations and types of events held during this period, including both onsite and virtual events. The map covers various regions and countries, highlighting the global reach and impact of the Global Manufacturing and Industrialisation Summit (GMIS).
GMIS Summits: the Tale So Far

The Global Manufacturing and Industrialisation Summit has given rise to four editions thus far, facilitating truly diverse and robust partnerships, initiatives and actions to advance an inclusive and sustainable Fourth Industrial Revolution. As we look towards the future, GMIS will continue to explore new horizons, engaging new partners and broaching new initiatives. For instance, 2022 saw the inaugural "GMIS America" event, engaging public and private stakeholders from the continent of North America as well as international delegations/attendees under the theme of Advancing Global Industrialization and Net Zero. However, the Summit will continue to act as the centerpiece of the GMIS initiative, gathering the highest level policymakers, private sector actors and cutting edge researchers to outline the best pathways towards an inclusive and sustainable digital transformation.

2017 ABU DHABI
The inaugural GMIS, which took place in Abu Dhabi, United Arab Emirates in March 2017, focused on establishing common ground on the future of manufacturing. These consensus points were elaborated by the stakeholders as follows: aligning the Fourth Industrial Revolution and the SDGs, enhancing the role of government and the global financial community; involving less developed regions; engaging local suppliers; retaining the workforce; making manufacturing aspirational; enabling climate action; promoting smart cities; formulating clear, concise and reliable international standards; and ensuring stakeholder alignment with the Fourth Industrial Revolution. Further detail on the Ten Principles may be found here. Additionally, GMIS 2017 saw the announcement of the inaugural MBR Initiative for Global Prosperity, which seeks to harness advanced manufacturing technologies for solutions to global development issues.

2019 YEKATERINBURG
Building on the momentum of the successful inaugural Summit, attention then turned to the thematic dimension of digital transformation, particularly biomimicry and nature-inspired technologies, given the vast potential economic growth and sustainability gains associated with this nascent form of innovation. The second edition of GMIS, convened in June 2019 in the city of Yekaterinburg, Russian Federation, saw the announcement of the successful entries to the first cohort of the MBR Initiative for Global Prosperity, which attracted over 10,000 applications from global innovators and technologists. GMIS 2019 also saw a call for academic submissions on potential nature-inspired innovations and heralded the President’s Challenge.

2020 VIRTUAL
Following the convention of the second summit, it was decided to amplify the potential impact of GMIS by hosting it on an annual basis. Originally, it was intended to physically convene the third edition in parallel to Hannover Messe, in Germany, which is the largest industrial trade fair in the world. However, as the unforeseen outbreak of the COVID-19 pandemic traversed the globe, necessitating lockdowns, remote working and social distancing, this proved impossible. The Co-Chairs thus decided to harness digital technologies to their fullest through endorsing a fully virtual GMIS 2020, under the theme of “glocalization: towards inclusive and sustainable global value chains”, an appropriate discussion topic amidst a “new normal” of enhanced digitalization and regional trade, global uncertainty and FDI contractions. GMIS 2020 broke new ground through the announcement of the green chain initiative, a multi-stakeholder initiative aiming to harness green hydrogen and cryptocurrency solutions in support of environmentally-conscious projects. The third edition of GMIS also established the inaugural GMIS working groups, aiming to derive concrete outcomes from the dialogue at GMIS. These focused respectively on gender responsive and inclusive manufacturing; an inclusive and sustainable industrial performance index; and future industrial safety, which led to the announcement of the Global Initiative for Industrial Safety - GIFIS, at GMIS 2020.

2021 DUBAI
GMIS 2021 returned to the United Arab Emirates, this time held in parallel to Dubai Expo 2020, which rolled over one year late due to the COVID-19 pandemic. The fourth edition of the Summit addressed “rewiring societies: repurposing digitalization for prosperity” and once again heralded a number of new global initiatives. These included the announcement of a future Global Biomedical Industrial Centre, aiming to increase resilience to future shocks, such as pandemics; and the Global Initiative for Industrial Safety. UNIDO also introduced a number of policy documents addressing various dimensions of digital transformation during GMIS 2021, such as the Industrial Development Report 2022, The Future of Industrialization in a Post-Pandemic World, a handbook on Ensuring Industrial Safety and Security; guidelines on Empowering SMEs through AR Technologies; a new module on science and technology parks; and a policy paper on standards for digital technologies.
GMIS LEGACY INITIATIVES AND WORKING GROUPS

A number of GMIS legacy initiatives and working groups have been established since 2017, with the intention of addressing various thematic and worldwide aspects of digital transformation. These include:

- **The Mohammed Bin Rashid (MBR) Initiative for Global Prosperity**
  First established in 2017, the MBR Initiative aims to harness the global “maker community” of technologists, entrepreneurs and industrialists to create innovative solutions to the world’s most pressing development issues. The MBR Initiative consists of two streams, i.e. the Global Maker Challenge and the Global Prosperity Award. The Global Maker Challenge is an online open-innovation platform that offers an opportunity for ‘makers’ and innovators to connect and collaborate, wherever they are in the world, to solve real-world problems affecting peoples lives. The related Global Prosperity Award honours the global manufacturer who adopts a Global Maker Challenge that has the potential of making the greatest positive impact on society, and with the greatest alignment to the Sustainable Development Goals. Further information is available via www.makingprosperity.com

- **The President’s Challenge**
  Deriving from GMIS 2019 in Yekaterinburg, a call for action to submit research papers around nature-inspired technologies which are less resource-intensive and more eco-friendly.

- **The Global Initiative For Industrial Safety (GIFIS)**
  GIFIS is a collaboration between UNIDO, GMIS, Lloyd's Register Foundation and the University of Cambridge, which brings together a global coalition of stakeholders putting safety at the heart of the Fourth Industrial Revolution. GIFIS aims to make the world a safer place by developing tools and resources to advance safety capabilities in the manufacturing sector.

- **The Green Chain**
  First announced at GMIS 2020, the Green Chain initiative seeks to harness blockchain and crypto currency solutions to accelerate the decarbonization of the global manufacturing sector and to encourage environmental impact investments in developing countries. Further information is available here: https://thegreenchain.com

- **The GMIS Working Group on Inclusive and Sustainable Industrial Performance**
  This expert-led working group will draw inspiration from UNIDO’s Competitive Industrial Performance Index in order to establish a bespoke global index measuring country and firm level performance in adapting to the economic, social and governance requirements of the Fourth Industrial Revolution.
GMIS and the COVID-19 Pandemic

The unforeseen emergence of the COVID-19 pandemic necessitated a flexible and innovative response, given the global disruption of industrial activity, value chains and commerce in 2020 and 2021, with the convening of traditional, in-person events becoming an impossibility.

In view of the extraordinary circumstances of 2020, GMIS 2020 was convened entirely virtually under the theme of “globalization: towards inclusive and sustainable value chains”, an essential consideration given the rapidly transformed industrial landscape worldwide. The virtual summit also featured several panels and expert contributions on how the international community could “build back better”, enhancing the resilience and competitiveness of the global economy while also meeting immediate humanitarian and social needs. This was particularly salient as the pandemic period had resulted in an acceleration of a nascent digital transformation globally, as countries, firms and individuals migrated to digital platforms in order to continue work operations, social life and essential value chains.

In this vein, several dedicated regional sessions of the GMIS Digital Series were also held, in order to gain intelligence on local, national and regional specifics with respect to the pandemic and the role that advanced technologies could play in revitalizing societies. These dedicated sessions included those listed below.

- **Industrial Recovery in Europe and Central Asia: Accelerating Digital Transformation for MSMEs (Micro, Small or Medium Enterprises)**
  - October 2020
  - Link to event

- **Reimagining Industry: Towards the Digital and Sustainable Twin Transition in Asia-Pacific**
  - October 2020
  - Link to event

- **How Information and Communication Technologies can foster Inclusive and Sustainable Industrial Development in Small Island Developing States**
  - January 2021
  - Link to event

- **Harnessing Policymaking to Bolster Innovation and the Digital Transformation of LatAm SMEs (Small and Medium Enterprises)**
  - September 2021
  - Link to event

- **Building Digital Capacities for Inclusive and Sustainable Industrial Development in Africa**
  - October 2021
  - Link to event

The GMIS Digital Series continues to provide a platform to engage grassroots stakeholders worldwide, as our societies recover from the lagging effects of the COVID-19 pandemic. Autumn 2022 will see dedicated webinars focusing on China and its digital lighthouses. As previously mentioned, GMIS is also currently working with a number of multi-stakeholder partners on global initiatives inspired by the role of advanced technologies in overcoming the developmental challenges of COVID-19, such as the Global Initiative on Future Industrial Safety and the potential Global Biomedical Industrial Centre.
GMIS and the Way Forward for 4IR

GMIS has evolved considerably since its inception in 2016, growing to encompass not only an annual summit event, but also local, national and regional events (GMIS Connect); virtual webinars (GMIS Digital Series); and a series of legacy initiatives and working groups addressing the various thematic overspills of digital transformation.

The status of developing countries within this unfolding paradigm is a particularly important consideration, given that digital technologies have been a central element of industrial resilience and recovery during the COVID-19 pandemic, and lack of access to the same may prolong the crisis period in developing countries and widen the global “digital divide”.

Moreover, even in countries with advanced technological and manufacturing capacities, a number of issues continue to disrupt both economies and societies, most notably pertaining to data protection; industrial and occupational safety; anti-social behaviour online, including incitement to hatred and “fake news”; and access to advanced innovation, particularly pertaining to micro, small and medium enterprises, which comprise approximately 90 per cent of firms worldwide. Such issues traverse international borders and cannot be resolved by unilateral actions: international fora must lead the way in promoting multi-stakeholder dialogue, partnerships and action, particularly in priority areas such as decarbonization of industry; sustainable energy; ending hunger; and achieving inclusive and sustainable value chains. GMIS can help to find solutions in these areas through awareness-raising, partnership-building, advocacy, policy advice and thematic initiatives.

UNIDO continues to promote an inclusive and sustainable approach to technological and industrial development. It has been rolling out a number of technical cooperation, policy advisory and convening initiatives in recent years. For instance, the Global Calls for Innovation, convened in 2020 and 2021 by the UNIDO Investment and Technology Promotion (ITP) network, mobilized the global community of innovators to propose technology-based solutions against COVID-19 and for global cleantech and sustainable land management, respectively. Several technical cooperation pilot projects have also been initiated, utilizing the likes of artificial intelligence, satellite technology, the Internet of Things, blockchain etc. to tackle issues in developing countries such as invasive species and bush encroachment; geothermal energy supply; carbon emissions in the automotive sector; and transparency in agro-industrial value chains, inter alia.

However, it is only through developing robust multi-stakeholder partnerships, deploying the strengths of each respective sector, that UNIDO can align its operations to capitalize on the potential of the Fourth Industrial Revolution, the SDGs and to realize its mission of “progress by innovation”. GMIS plays a key role in the Organization’s advocacy, networking and showcasing of knowledge products pertaining to advanced manufacturing technologies and innovation, and we look forward to brokering new industrial development initiatives through GMIS in the near future.