

## Digitalization: What we need to talk about

A major technical revolution is underway. How will it change the coexistence of humankind on this planet? What goals will it serve? What opportunities and risks does it involve? Who will gain or lose power in its wake? How can it be used to solve humankind's great challenges?

### Place digitalization at the service of global sustainability

Digitalization is changing the world. The interaction of data collection, networking, artificial intelligence and robotics is driving radical changes in personal, societal and economic life worldwide. In 2015, the United Nations '2030 Agenda' set 17 ambitious Sustainable Development Goals (SDGs) serving as a guideline for all states up to the year 2030. They aim to ensure human dignity, protect the planet, foster peace and prosperity for all, and promote global partnerships. The digital revolution is still in

its infancy, but there is no doubt that it will significantly influence the chances of achieving these goals. Furthermore, it will trigger an extended discussion on sustainability. Essential aspects of human dignity and the image of humankind itself will be affected.

The WBGU is currently working on 'Digitalization and Sustainability' and would like to stimulate a broad discussion by outlining two premises and ten sets of questions.

#### Premise 1: Digitalization urgently needs to be shaped

Digitalization is often experienced and described as an unstoppable, accelerating process. Yet it is not a 'force of nature', but a development driven by humans. Therefore, it can and should be shaped. In order for this to succeed, the processes and effects of this technical revolution must be understood by the societal players, and its causes and drivers made transparent. We need forums for discussing how digitalization can be linked to societal goals, and what roles should be played by public and private, local and global players. The WBGU proposes that digitalization should be explicitly placed at the service of a global transformation towards sustainability.

The 2030 Agenda makes it clear that securing the natural life-support systems, human well-being, quality of life and societal inclusion can only succeed hand in hand. In order to achieve the Agenda's Goals, we need to fundamentally change the way we do business and consume. Although digitalization is hardly mentioned in the 2030 Agenda, it will greatly influence its implementation. Given the far-reaching and long-term impact that new technologies will have on human beings themselves, on their privacy, as well as on economic and political processes, we must also urgently think beyond 2030. Human dignity, which is enshrined in both the Universal Declaration of Human Rights and the 2030 Agenda, should take centre stage in the deliberations.

#### Premise 2: Sustainability is a vision of global, long-term well-being

# Key questions for a digital, sustainable society

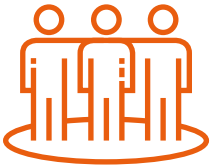
## Sustaining the natural life-support systems



Limiting climate change and sustaining natural life-support systems are key concerns of the 2030 Agenda. Digital technologies offer potential for ensuring compliance with planetary guard rails and for local environmental protection. Examples include the low-carbon transformation of energy and mobility systems, the circular economy, dematerialization and the protection of ecosystems. On the other hand, new digital infrastructures, products and services are driving up energy consumption and the demand for resources; waste and long-lived anthropogenic pollutants (e.g. electronic waste, new chemical compounds and alloys) pose environmental and health risks.

- > What kind of framework must be created to ensure that digitalization's positive impact on resource use and environmental protection outweighs its negative effects?
- > How can we ensure, for example, that Industry 4.0 leads to sustainable, low-carbon production methods?

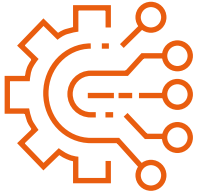
## Poverty reduction and inclusive development



The 2030 Agenda includes the goal of eradicating poverty worldwide. Many developing countries and emerging economies – and especially poor people within these countries – have hardly benefited from digitalization up to now, even though it offers potential for overcoming spatial and social barriers. More than 850 million people still live in slums without adequate access to vital infrastructures. About 2 billion people have no access to information and communication technologies. The rapid pace of digitalization could jeopardize the integration of developing countries, as well as the poor in many societies, into the world economy.

- > How can the direction of digitalization be influenced in a way that improves the living conditions both of people affected by absolute poverty and of the poorer half of the world's population, who only earn about 10% of global income?
- > How can digitalization's potential for inclusive development be effectively used on a broad scale, and how can digital inclusion be ensured?
- > What conditions beyond digitalization need to be met to achieve this?

## Future of work and reducing inequality



The 2030 Agenda includes the goals of decent work for all and reducing inequality. Digitalization is likely to cause major upheavals in global labour markets and the international division of labour. There will be winners and losers. Global networking offers opportunities for new forms of employment, and the value of some occupations will increase considerably. Other occupations – forms of work that are often no less relevant for society – will remain underpaid. At the same time, there is a risk of social standards being undermined and knowledge-based jobs being replaced by artificial intelligence. This is a challenge not only to the way countries finance themselves, i.e. based on earned income, but also to social-security systems, which might even become more important in the future.

- > How will the societal and economic function of work change as a result of digitalization?
- > How can the economic inclusion of all people be guaranteed in the future?
- > How can digitalization be prevented from becoming a multiplier of inequality?

## Knowledge, education and digital literacy



Quality education for all people is a key objective of the 2030 Agenda. Digitalization accelerates the generation and dissemination of information, as well as worldwide learning processes. On the one hand, this offers great opportunities for solving major problems of humankind and for enabling all people to access knowledge, education and training, not least in developing countries and emerging economies. On the other hand, there is a growing danger of manipulation or a selective perception of facts. The ability to deal responsibly with digital media will be a key qualification in the future.

- > What is quality education for the digital age?
- > What skills and knowledge are necessary for broad-based societal and economic inclusion?
- > How can the growth and dissemination of knowledge made possible by digitalization be used to enable people to shape their future and hone their sustainability-related skills?

The human rights that form the foundation of sustainable development include the protection of privacy. Much of the potential discussed for the transformation towards sustainability is based on the use and networking of large amounts of data. This applies, for example, to data-driven advances in medicine, but also to the control of mobility. However, the collection, pooling and analysis of large amounts of data (Big Data) also allows extensive monitoring of private activities and preferences, even massive intrusions on privacy and personal rights. Big Data raises questions as to who controls data, and paves the way for new business models and political practices that affect human dignity. Freedom is at risk whenever authoritarian structures have access to digital monitoring.

- > How can privacy, self-determination, data protection and data security be guaranteed?
- > Who has access to the knowledge that is generated from the data, and who benefits from its use?
- > What role might be played by the concept of global commons (e.g. knowledge commons, open data) in the use of data and knowledge?

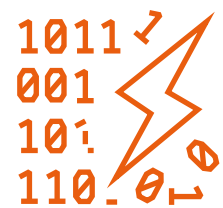
### Big Data and privacy



Another objective of the 2030 Agenda is the establishment of resilient infrastructures. Digital technologies are increasingly taking on complex monitoring and control tasks, even including autonomous systems that make their own decisions in business and society. This makes our societies and individual people more dependent on interconnected, digitally controlled technical infrastructures. The challenge will be to guarantee that these are reliable and not prone to technical failure (e.g. loss of power), manipulation or abuse (e.g. hacking). In addition, interactions between technical systems and people must be designed in way that maintains human control over technical systems.

- > How much responsibility do we want to cede, and how do we legitimize this?
- > Should robust, fault-tolerant systems be enshrined as a new guiding concept and how can this be done?

### Fragility and autonomy of technical systems



Digitalization can fundamentally change competition and the distribution of value creation. Although the direction and speed of digitalization are frequently determined by economic interests, it is often not easy to distinguish between who is driving digitalization and who is being driven by it. Effects generated by the Net Economy open up incentives and opportunities for monopoly formation. Several corporations in the digital economy are already generating levels of turnover that far exceed the GDP of many countries. Digital currencies are experiencing a boom, while their long-term effects on financial and monetary markets are impossible to predict. There are few indications that the global digital revolution is geared towards the Sustainable Development Goals of the 2030 Agenda, even if many players stress that they are acting for the benefit of humankind. The aims of digitalization have hitherto been explicitly and implicitly defined by a complex landscape of players that hardly meets the requirements of democratic legitimacy or state scrutiny.

- > How can societal and political players be empowered to help shape the digital future?
- > How does the international community intend to deal with the observed fundamental power shifts?
- > What would a globally networked law on competition look like that aims to contain economic power in the digital age?

### Economic and political power shifts



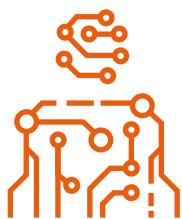
Political and societal measures are needed to reconcile the effects of digitalization with the 2030 Agenda. Digitalization unleashes its disruptive power with great speed and global reach, while most efforts to regulate it lag behind, require time-consuming negotiation processes, and are predominantly made on a national scale. Furthermore, all forms of democratic governance of digitalization require a systemic understanding of the dynamics, opportunities and risks of digitalization by the political and social players, and this is often lacking today. At present, it is impossible to predict whether irreversible paths are being pursued, or whether there are tipping points in digital development beyond which the possibilities of democratic regulation are limited.

- > What is the best way to deal with the asynchronicity of technical-economic change and governance?
- > What might early warning systems for tipping points look like?
- > How can a global governance of digitalization succeed?

### Acceleration and the limits of governance



## Homo digitalis



The 2030 Agenda focuses its attention on the well-being of all people. Digitalization is increasingly making it possible to expand human capabilities. Assistance systems, implants, sensors and other forms of interaction between people and technical systems can compensate for physical disabilities (e.g. with prostheses), or even shift the parameters of human capabilities (e.g. our cognitive potential). Humankind is in the process of irreversibly changing not only the planet, but also itself. 'Intelligence' used to be a 'unique selling point' of human beings and the foundation of human civilization. Now we are enabling technical systems to imitate intelligence. This gives rise to fundamental questions on ethics and human dignity.

- > How should the forums for discussing and making decisions on Homo digitalis be designed?
- > On what criteria should we base the rules on how we handle technical possibilities in the future?
- > How can societal barriers be placed before commercial interests?

## Dystopia



There can be no sustainable development without peace and functioning legal systems; this is reiterated by the 2030 Agenda. Digitalization creates fundamentally new areas of human development. For example, transferring the authority to make decisions to technical systems (e.g. in stock markets, the administration of justice, autonomous mobility, health diagnostics) offers opportunities for solving problems, but also involves the risk of losing control over societal processes. There is great destructive potential in the use of autonomous weapon systems or cyberwars (e.g. digital attacks on key infrastructures or the dissemination of 'fake news' to exert political influence). Dystopian scenarios even encompass the creation of a technical superintelligence far superior to humans which could then assume control. But long before we reach such a stage, the question arises as to how to design interactions between human civilization and intelligent technical systems in a way that focuses attention on human well-being.

- > How can digitalization be structured in a way that limits the loss of control and gears digitalization towards human goals?
- > What forms of cooperation can help secure peace and guarantee basic rights, and how can they be supported digitally?

The WBGU believes it is essential to shape digitalization with a view to the necessary transformation towards sustainability. These questions are intended to stimulate a debate on this topic and to encourage people to get involved in these developments. In the course of its current work on a report dealing with the relationship between digitalization and sustainability, the WBGU will organize various events at which the above questions can be discussed.

## Recommendations for further reading on the UN's Sustainable Development Goals and the transformation towards sustainability

UN – United Nations (2017): Sustainable Development Goals. 17 Goals to Transform Our World. Internet: <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>. New York: UN.

WBGU – German Advisory Council on Global Change (2011): World in Transition – A Social Contract for Sustainability. Internet: <http://www.wbgu.de/en/hg2011/>. Berlin: WBGU.

### German Advisory Council on Global Change (WBGU)

The WBGU is an independent scientific advisory body set up by the German government. The WBGU provides policy-makers with recommendations for action and research and is currently working on a flagship report on 'Digitalization and the Transformation towards Sustainability'.

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