Digitalization



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» Digitalization and sustainability are often referred to as two megatrends that are shaping the economy and society. However, the two phenomena are very different:

Digitalization is massively changing reality and influencing almost every aspect of our lives, while sustainability is a normative goal that has not yet become a reality in most areas.

Maike Gossen and Otmar Lell. Sustainable consumption in the digital age. A plea for a systemic policy approach to turn risks into opportunities. GAIA 32/S1 (2023): 71 – 76

» The combination of digital progress and capitalist ideology in a fully monetarised society obviously leads to a concentration of power among a few, mostly private, actors.

Translated from: Jonas Lüscher, Writer - Interview in the newspaper Tages-Anzeiger, 06.01.2018

» We will end up with «digital by default» unless we choose «digital by design». We shouldn't view technology through the lenses of Big Tech where the role of algorithms is to replace humans.

We should start by valuing the outcomes that we want technology to help achieve such as reducing carbon and improving the returns to labour.

Mark Carney. Book: Value(s) – Building a Better World for All. 2021.



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» Overall, digitalization processes today tend to act as *«fire accelerants»*, exacerbating existing non-sustainable trends such as the overuse of natural resources and growing social inequality in many countries.

On the one hand, it must be plainly stated that the digitalization of business and everyday life has so far been marginally oriented towards sustainability aspects.

On the other hand, digitalization offers an enormous range of possibilities for supporting the Great Transformation towards sustainability.

German Advisory Council on Global Change. ***Towards our Common Digital Future****. 2019. PDF*

» The three main objectives of ecological sustainability are *decarbonisation*, *dematerialisation* and *renaturalisation*. In theory at least, the growth of digital services can be compatible with the goals of ecological sustainability. But today's reality is far-removed from that ideal.

The consumption of energy and material is actually increasing as digitalisation expands. This situation will not change unless the majority of affected companies adopt the three ecological objectives as binding principles.

Ortwin Renn, et al. The opportunities and risks of digitalisation for sustainable development: a systemic perspective. GAIA 30/1(2021): 23–28

» The energy consumption of digital infrastructure is increasing, because the intensity of use is growing faster than efficiency. It is true that microchips have become more energy-efficient by a factor of at least one billion over the last five decades.

This means that you can now calculate a billion times more for a kilowatt hour of electricity than fifty years ago. There is no other technical field in which energy efficiency is increasing so rapidly. But utilisation is growing even faster, which is why overall consumption is increasing sharply.

Translated from: Mathias Plüss. Interview mit Prof. Lorenz Hilty. Fussabdruck der Digitalisierung. Newsletter Planet Plüss. Tages-Anzeiger. 02.06.2024



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» The relation between digitalization and environmental sustainability is ambiguous. On the whole, the form of digitalization we have witnessed in the past decades has not solved any of the pressing environmental issues of our time: Despite innovative small-scale initiatives, it can be noted that in none of the key sectors – transport, energy, agriculture, housing, consumer goods – did the introduction of digital tools so far spur transformation towards sustainable alternatives.

*T. Santarius etal. **Digitalization and Sustainability: A Call for a Digital Green Deal**. Environmental Science and Policy. September 2023. PDF*

» The report «AI for a planet under pressure» raises a critical question:

Can artificial intelligence (AI) be applied both responsibly and effectively to address complex and interconnected sustainability challenges? These challenges include climate change, biodiversity loss, ocean acidification and other transformations of our living planet.

In conclusion, it shows that:

- AI offers vast potential to accelerate progress across the sustainability sciences.
- AI can sharpen our decision-making and clarify complex environmental challenges for researchers and the public alike.
- However, realizing this promise requires careful navigation of the risks, including AI's own environmental footprint, inherent biases, and the challenge of unequal access.
- Despite these hurdles, responsible and ethical applications of AI in sustainability research are not just a possibility - they are an urgent necessity.
- Pioneering these uses can unlock the breakthroughs we need to build a more sustainable future.

  *Galaz, V. and M. Schewenius. **AI for a planet under pressure**. Stockholm Resilience Centre, Potsdam Institute for Climate Impact Research, Google DeepMind. November 2025*

» In fact, we will need artificial intelligence (AI) for a world worth living in. After all, we will not be able to predict floods, better manage droughts, understand the melting of glaciers or adapt agriculture to changing conditions without IT and AI.

The big breakthroughs are not that ChatGPT can write an essay, but that AI can improve personalised medicine or that it can be used as a technology to take action against climate change. It is therefore necessary to make artificial intelligence sustainable.

We have various stages of industrialisation: mechanisation, electrification, computerisation and now we are in the digitalisation stage. The fifth stage is the ecologisation and the personalisation of our systems - and we need to get to this Industry 5.0 quickly.

It will not work without an economic transformation. We will move from *efficiency* to *sufficiency* and ask ourselves what and how much needs to be digitalised in order to develop a balanced life for people.

Translated from: Ivona Brandić, Professor for High Performance Computing Systems at TU Wien. Warum KI beim Thema Nachhaltigkeit nachsitzen muss. Profil 25. März 2025