Concept for a Sustainable Society: "Society 5.0 — Technology Trends and Society" on Jan. 30., 2024

Living and doing business with people at the centre: The "Society 5.0" model could provide the answer to the diverse challenges in a complex networked world.

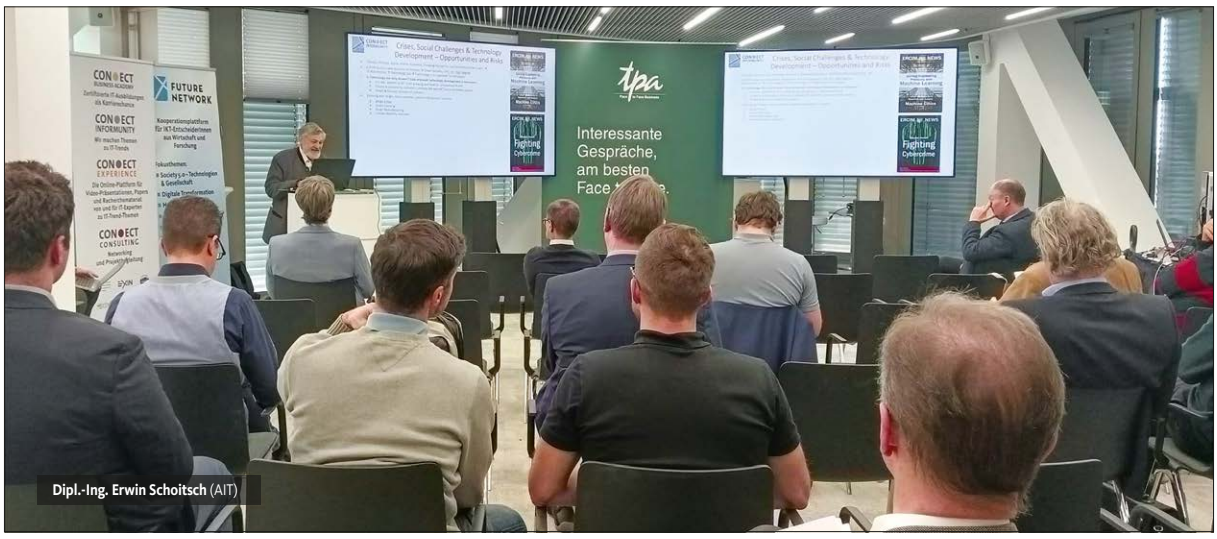
These are fundamental questions of humanity that need to be discussed in a world increasingly permeated by technology. Who am I? What role do I play in a community? And what is true? At an event organised by the think tank Future Network www.future-network.at together with the training and conference partner CON•ECT Eventmanagement on January 30th, ideas and concepts for fair, democratic systems in business and politics were discussed. Under the title "Society 5.0 — Sustainable Technology Trends and Society," experts from science and the fields of material cycles, mobility and infrastructure spoke at TPA Management Consulting in Vienna. Future Network is a dialogue forum between users, vendors and research, and organizes events in the DACH region together with CON•ECT and partners such as VÖSI, UBIT, ÖGV, SCCH and ABC Research.

Following an introduction by **Bettina Hainschink** and **David Steinmetz, Markus Müller** (TPA) set the tone with an explanation of how we as a society are at a turning point as we attempt to reconcile digitalization and sustainable management in many areas of our working lives.

For **Erwin Schoitsch**, an expert in norms and standards at the **AIT Austrian Institute of Technology**, the achievements of digitalization require a critical view of technical progress. The term Society 5.0 was formulated in a government program in Japan in 2017 to develop assistive technologies for the aging population, especially robotics. Humans, as part of a "super smart society", an extensive network from the street to the bedroom, may be an exaggerated idea. However, smart products and infrastructures are also being sought in Europe to solve a wide range of challenges. The EU is now following the predecessor trend of Industry 4.0 with a political programme of subsidies, regulations and funded research for a sustainable society. It is a new way of doing business that not only focuses on the individual person and individual systems — keyword: production in units up to batch size one — but always considers goals in the context of their environments. Schoitsch explains the "system of systems" using mobility as an example: Even with a fully autonomous vehicle, journeys from Vienna to Copenhagen will make little sense. Only the combination with, for example, rail transport enables the optimal mix from the perspective of resource consumption and environmental impacts. "In the future, available technology will be geared toward needs," says the expert. This requires trust in technology, which must be built and function in a transparent, ethically correct and reliable manner. Because, in a complex world in which social media platforms have the sovereignty of interpretation, people "often can no longer see through what is happening around them," says Schoitsch.

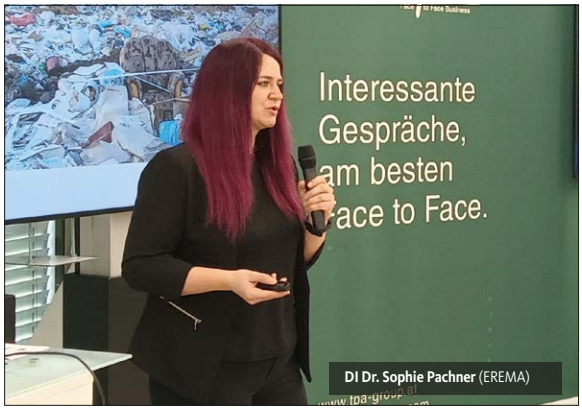
Better Decisions

Dirk Helbing, Professor of Computational Social Science at **ETH Zurich**, also sees many opportunities, but also potential dangers in the digital revolution. "Move fast and break things" has long been the motto of the IT industry in Silicon Valley. "This has indeed broken many things," says Dirk Helbing, and not always for the better. Among other things, he sees the "cornerstones of democracy in danger". In fact, there are already digital twins of people today: highly accurate profiles for commercial evaluation by companies or social scoring by governments. People need to be aware that "a global information war is currently raging over our heads". Helbing therefore calls for the achievements of digitalization to be used specifically



Dipl.-Ing. Erwin Schoitsch (AIT)

Keynotespeaker Prof. Dr. Dirk Helbing (ETH Zürich)



DI Dr. Sophie Pachner (EREMA)

to improve the quality of our lives together, even in a time of "polycrises". He cites cities and smart cities as a good example of complex dynamic systems that are more than the sum of the properties of their parts: Every interaction between individuals, with the environment and with companies, including the use of infrastructures, creates new dynamics, he says. For this reason, every metropolis needs its own suitable recipe for mastering its tasks. A suitable competition between cities could unleash the power of innovation worldwide and also the "wisdom of the many", sometimes also referred to as swarm intelligence.

According to the scientist, the data basis for decisions in urban planning is now available, but the rapidly growing volumes of data often overwhelm conventional data processing — despite the use of AI. Helbing sees the solution in distributed control and decision-making in the direction of "self-organization", even on a small scale. Initial trials are already underway with smart traffic lights in Lucerne, which dynamically adapt green phases to vehicle, public transport and pedestrian traffic and have been proven to reduce waiting times for everyone. In the citizen participation project "Stadtidee" in Aarau, also in Switzerland, insights were gained into how more projects can be promoted with distributed voting and the consideration of different population groups — more resource-efficient, fairer, more transparent and more inclusive. "Digitalization offers many opportunities to upgrade democracy," emphasizes Dirk Helbing. In his view, new solutions for pluralistic societies with numerous objectives are possible on the basis of "collective intelligence" — solutions that are "better than optimal", i. e. better than conventional optimization processes can deliver.

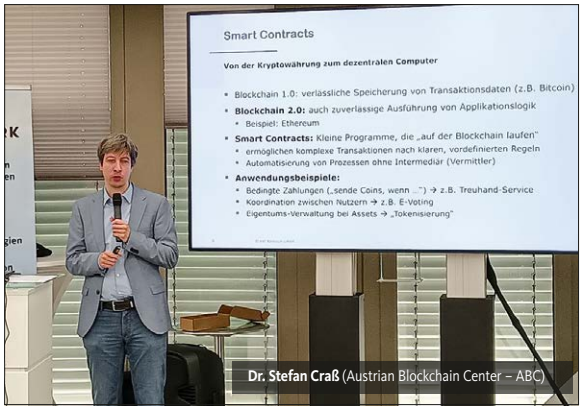
Intelligence for Recyclable Material Flows

How data science and artificial intelligence optimize the circular economy was demonstrated at the event by **Sophie Pachner** and **Markus Manz**. Every year, millions of tons of plastic waste are generated worldwide — only about a tenth of it is recycled. The **Software Competence Center Hagenberg (SCCH)** is researching together with the mechanical engineering company **Engineering Recycling Maschinen und Anlagen Ges.m.b.H. (EREMA)** how AI can be used to increase the recycling rate. Despite the increasing efficiency of sorting and washing systems — up to six tons of waste can be processed in one plant per hour — the different material flows and differently-timed processes in recycling pose major challenges for operators. An intelligent plant design with anomaly detection and better interfaces between man and machine is intended to improve the re-use of raw materials and waste. Plastics technician Sophie Pachner sees a "great potential to improve processes, products and services with the help of AI technologies." In cooperation with SCCH, EREMA is working on self-learning process control systems that inform employees in good time before impending bottlenecks. SCCH has developed a dashboard for the visualization and analysis of the process data. Managing Director Markus Manz speaks of the limits of rule-based controls in complex systems. The next step in efficient processes in industry is the exchange of data in value chains across company boundaries, says Manz. In a new approach, it is not data that is exchanged, but its encrypted, representative images. This enables ecosystems for the commercial use of data, in which the data owner continues to have secure control of it. It is a model that is also used in Society 5.0 for the secure, digital identity of citizens.


Mag. Markus Manz (SCCH)

Decentralized, Smart City

Stefan Craß from the Austrian Blockchain Center (ABC) gave a lecture on how a "smart life" and the achievement of climate goals can be supported with blockchain technology. According to a UN study, around 68 % of the world's population will live in urban areas by 2050, up from 55 % in 2018. "Smart cities" are now supposed to use technology and data to create more livable environments for their residents while minimizing resource consumption. According to Craß, the decentralised blockchain has emancipated itself from its image as an ener-



Dr. Stefan Craß (Austrian Blockchain Center – ABC)

gy-guzzling basic technology for the cryptocurrency Bitcoin. In various forms, it could drive the transformation of smart cities. Especially in terms of transparency, equality and immutability, the so-called "distributed legers" have an advantage over centrally managed systems. Craß cites the example of "Brooklyn Microgrid" — a local electricity trading platform in New York that directly connects generators with rooftop PV and consumers in the neighborhood. These immediate, transparent transactions of data and business processes are also conceivable, for example, in the case of proving the CO_2 footprint of products or in parking space management, in which vehicles autonomously negotiate fees with the parking machine via "smart contracts." There are also initial applications in Austria, such as the "Culture Token" project in Vienna, which rewards climate-friendly mobility behaviour in a playful way. The expert sees new forms of organisation such as DAO — the abbreviation stands for "Decentralised Autonomous Organisation" — as a promising, fair model for citizens' initiatives, for example.

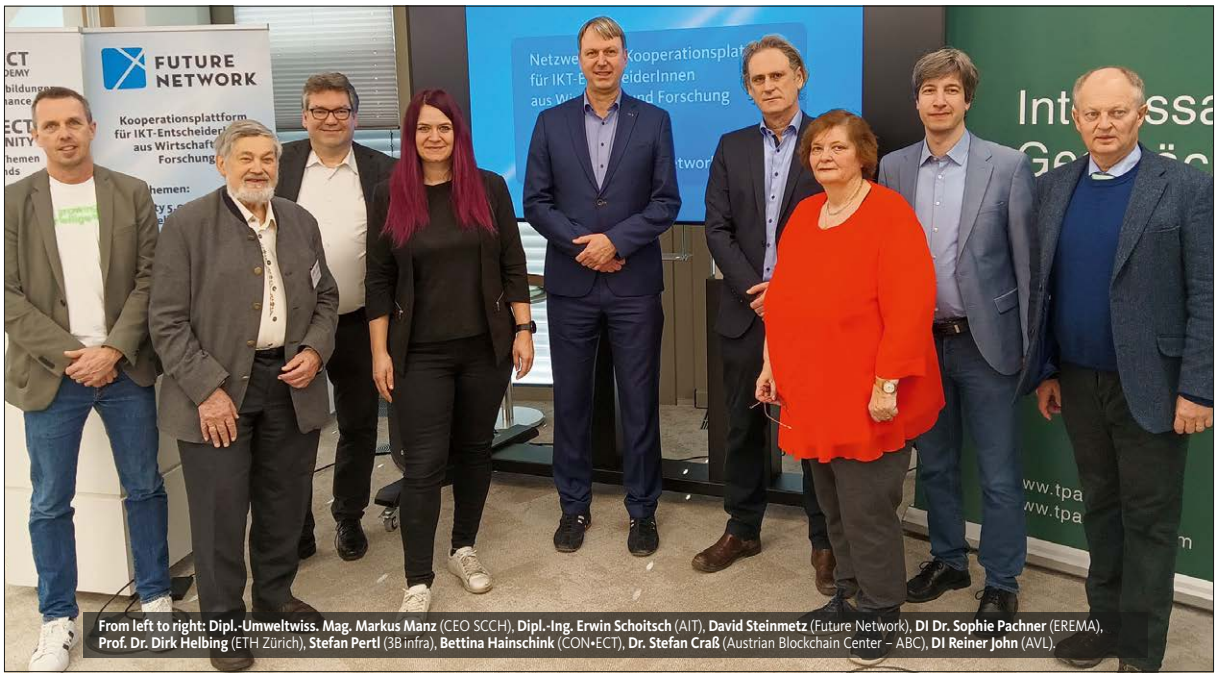
Rail, Road and Sovereignty

Stefan Pertl (3B infra)

Further perspectives from different industries on sustainability and resource efficiency were provided by **Stefan Pertl**, Managing Director of **3B infra**, and Reiner John from AVL in Graz. The software company 3B infra has been focusing on the management of railway infrastructures for 15 years. Pertl is confronted with the different perspectives on railway as an asset — in terms of the durability of tracks, bridges and tunnels, the activities of countless players in the planning, construction and maintenance of these assets, as well as various industry standards. This diversity is also reflected in the jobs in the industry. "Everything you can study in a technical university, you can also find in a railway company," says Pertl.

DI Reiner John (AVL)

At **AVL**, **Reiner John** leads the coordination of strategic R&D topics for European funding projects. His focus encompasses digitization, affordability, user-friendliness, and emissions reduction. John identifies a paradigm shift in the transportation sector, where the electric car is no longer viewed in isolation but as a link between cost-effective energy usage and convenient traffic planning. Through interactions of energy consumption and traffic, such as charging in different networks, it serves as a "glue" bridging mobility, infrastructure, and energy systems. Significant potentials lie here for optimizing energy networks through renewable energy, emissions reduction, affordability, and cost improvement. Decisions regarding usage and planning are increasingly made in cyberspace, from charging processes to demand-based navigation and commercial sharing models. For John, this is an incremental process: the electric vehicle becomes the connecting element for mobility, infrastructure, and energy. It propels changes in living spaces, significantly influencing the efficient use of electric energy and safety in the transportation sector. One thesis posits that the electric vehicle becomes the "kit" of the ecosystems of mobility, infrastructure, and energy.



From left to right: Dipl.-Umweltwiss. Mag. Markus Manz (CEO SCCH), **Dipl.-Ing. Erwin Schoitsch** (AIT), **David Steinmetz** (Future Network), **DI Dr. Sophie Pachner** (EREMA), **Prof. Dr. Dirk Helbing** (ETH Zürich), **Stefan Pertl** (3B infra), **Bettina Hainschink** (CON•ECT), **Dr. Stefan Craß** (Austrian Blockchain Center – ABC), **DI Reiner John** (AVL).

In the concluding panel discussion, entrepreneur **Peter Lieber**, President of **ÖGV**, the Austrian Trade Association, emphasized the key role of the European Union in the field of data security and privacy: "In a digitalized society, we need clear rules for sovereignty so that personal data remains private property."

The event Society 5.0 — Sustainable Technology Trends and Society — on the platform www.conect.at/experience is available in the stream at:

- **Society 5.0 — Ein Konzept für »Nachhaltiges Leben«? — Erwin Schoitsch (AIT):** https://www.conect.at/papers/society-5-0-ein-konzept-fuer-nachhaltiges-leben-v-p
- **Künstliche Intelligenz im Kunststoffrecycling — Dipl.-Umweltwiss. Mag. Markus Manz (SCCH), Sophie Pachner (EREMA):** https://www.conect.at/papers/kuenstliche-intelligenz-im-kunststoffrecycling
- **Smart City — Smart Living. Wie Blockchain-Technologie mithelfen kann, Klimaschutzziele zu erreichen — Stefan Craß (ABC):** https://www.conect.at/papers/smart-city-smart-living-wie-blockchain-technologie-mithelfen-kann-klimaschutzziele-zu-erreichen
- **Society 5.0 — quo vadis? Der Mensch und die digitale Zukunft — Helbing (ETH Zürich):** https://www.conect.at/papers/society-5-0-quo-vadis-der-mensch-und-die-digitale-zukunft
- **Railway Master Data Management — Stefan Pertl (3B infra):** https://www.conect.at/papers/railway-master-data-management
- **Podiumsdiskussion mit Statements:** https://www.conect.at/papers/society-5-0-podiumsdiskussion-mit-statements

Presse contact

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AGENDA OF THE EVENT

Society 5.0 – Ein Konzept für »Nachhaltiges Leben«?
Dipl.-Ing. Erwin Schoitsch (AIT)

Künstliche Intelligenz im Kunststoffrecycling
Dipl.-Umweltwiss. Mag. Markus Manz (CEO SCCH), DI Dr. Sophie Pachner (EREMA)

Smart City – Smart Living. Wie Blockchain-Technologie mithelfen kann, Klimaschutzziele zu erreichen
Dr. Stefan Craß (Austrian Blockchain Center – ABC)

Society 5.0 – quo vadis?
Der Mensch und die digitale Zukunft
Mit Diskussion
Prof. Dr. Dirk Helbing (ETH Zürich)

Railway Master Data Management
Stefan Pertl (3B infra)

Panel discussion with statements on "Nachhaltig Leben, Umwelt, Mobilität und Arbeitswelt von morgen – Herausforderungen für die Gesellschaft"
Moderation: David Steinmetz (Future Network)
Prof. Dr. Dirk Helbing (ETH Zürich), Dr. Rainer John (AVL) – Kurzbeitrag, Mag. Markus Manz (SCCH), Peter Lieber (ÖGV, VÖSi, Sparx), Stefan Pertl (3B infra)

Future Network is a network and cooperation platform for ICT decision-makers from business and research www.future-network.at with an expert committee of leading researchers and research institutions, and representatives from industry and Society 5.0.

CON•ECT Eventmanagement is an accredited training provider for certified IT training and conference organizer with networking.

Further contacts:

- **www.voesi.or.at**
- **www.ait.ac.at**
- **www.scch.at**
- **https:**//www.wko.at/wien/information-consulting/unternehmensberatung-buchhaltung-informationstechnologie/
- **www.gewerbeverein.at**
- **www.itsmf.at**

The event was supported by: