



SYSTEMS AND ETHICAL APPROACHES 2022

5-6G MOBILE NETWORKS, TECHNOLOGY THAT WILL CHANGE WORLD

28th SEP conference
3th November, 2022

Prague University of Economics and Business
Czech Republic



MORE INFO : [DEL.VSE.CZ/KONFERENCE](https://del.vse.cz/konference)

📍 NÁMĚSTÍ WINSTONA CHURCHILA 4

SYSTEM AND ETHICAL APPROACHES 2022 PROCEEDINGS

28th conference

Organizers:

Department of System Analysis
Prague University of Economics and Business

Institute of Computer Science, Faculty of Philosophy and
Science in Opava, Silesian University

Editors:

Richard Antonín Novák
Tomáš Sigmund
Anna Novotná

Abstracts proceedings

Publisher:

Oeconomica Publishing House

systemsapproaches.vse.cz

2022

Programme Committee:
Ing. Richard A. Novák, Ph.D.
Mgr. Ing. Tomáš Sigmund, Ph.D.
PhDr. Ing. Antonín Pavlíček, Ph.D.
Ing. Jiří Korčák
Mgr. Anna Novotná, Ph.D.
Mgr. Kamil Matula, Ph.D.

Design: Jiří Korčák
Technical editor: Anna Novotná

**Proceedings of the Conference System and Ethical
Approaches 2022, 5-6 G Mobile Networks, Technologies
which will change the World, 3rd of November 2022**

1st Edition

2022

ISBN 978-80-245-2475-7

© Oeconomica Publishing House

Systems and Ethical Approaches is
licensed under Creative Commons
Attribution-ShareAlike 4.0
International License.



Content

Richard Antonín Novák	1
5-6G Mobile Networks: Technology that will Change the World!	
Tomáš Sigmund	3
Integration of 5G, 6G Networks into Human Life	
Tomáš Verner	5
T-Mobile's Expectations as a 5G Operator	
Roman Kramařík	7
Legal Perspectives on 5G & 6G	
Antonín Pavlíček	11
Facebook, Metaverse and 5G, 6G as Enablers for New Services	
Anna Novotná	13
The Impact of 5G, 6G Technologies on Society: a Sociological Perspective	

Kamil Matula	15
The Impact of 5G, 6G Technologies on Society: Opportunities and Challenges	
Tomáš Tichý and Tomáš Šmerda	19
Using 5G Networks for Diagnostics in ITS	
Jiří Korčák	21
Main Ethical Dilemmas of 5G/6G	
Closing word of Tomáš Sigmund	23

Preface

We know from history that the introduction of each new generation of mobile networks has had a huge impact on global society, and not just from a technological perspective. The proliferation of the Internet and new services, the increase in people's mobility, the change in access to privacy or the emergence of new business and working models are examples of how third and fourth generation telecommunications networks have recently changed our lives.

Fifth-generation (5G) mobile networks are networks that, for the first time in history, are primarily dedicated to IoT technologies and devices, as all people already have their mobile phones where the transmission speed is sufficient for their needs. The B2C often mistakenly thinks that 5G and 6G mobile networks are all about increasing data speeds from nx100 Mbps to nx100Gbps, and is about appreciation of the greater convenience of streaming movies, music and other multimedia. Operators see these new technologies as a new source of revenue and way how to differentiate from competing local ISPs. Business customers expect legacy LAN and Wifi solutions to be replaced by new 5G campus networks at lower prices.

In our view, however, this is a very different world that we are heading into without realising what are we gaining and what are we losing. In the new 5-6G world, autonomous vehicles are communicating and making decisions in real time without human influence. Holograms supported by the Metaverse platform are replacing physical encounters, and the sky is littered with transmitters that spread milli- and microwaves we know nothing about.

From a technical perspective, terms like real-time AI control (IoT & Industry 4.0), connection density (devices/km²), latency (ms-micro/s), reliability (99,99%), user data rate (Gb/s), peak data rate (Tb/s), energy efficiency, spectral efficiency, microchip density sound attractive. This new world reminds us of an episode of Star Trek, where its authors Qualcomm, Huawei or Samsung promise us a positive future in 5G and 6G networks. However, the question of practical philosophy, i.e. ethics, remains: why are we doing this? What do we expect from 5-6G networks? Do we know all the possible scenarios? And how will we live our private lives properly in this futuristic era?

Ing. Richard A. Novák, Ph.D.

5-6G Mobile Networks: Technology that will Change the World!

Richard Antonín Novák

DEPARTMENT OF SYSTEM ANALYSIS, FACULTY OF INFORMATICS AND STATISTICS,
PRAGUE UNIVERSITY OF ECONOMICS AND BUSINESS

richard.novak@vse.cz

KEYWORDS:

5G technology – 6G technology – telecommunication

ABSTRACT:

This contribution presents the evolution of mobile networks and expectations related to the arrival of new 5G and 6G technologies in the context of technical and socioeconomic perspectives. In the first part, the paper focuses on the technical parameters of the new networks and the different concepts designed for public (macro) and private (micro campus) networks, respectively, the differences between 5G and 6G technologies.

In the second part, the work explores the area of innovation that comes with new mobile networks and describes possible use cases in different fields. A significant part is also devoted to the description of the technology ecosystem, which includes not only public network operators, but also cloud providers, HW telecom component manufacturers, IoT endpoint sensors, integrators, and a number of complex solutions implemented in mutual and necessary collaboration as unique solutions for different industries.

The third and final part of the contribution examines the impact of 5G and 6G networks on society and the wider ethical context.

It describes future scenarios for the digitisation of society with the help of mobile networks, which not only have positive possibilities but also a number of negative phenomena that manifest themselves differently in different regions and social groups. Overall, the work seeks a balanced, comprehensive view and a multidisciplinary perspective on both the benefits and risks associated with the introduction of new mobile networks, which the author considers revolutionary in many aspects.

ACKNOWLEDGMENT

This work was supported by grant of the SKODA AUTO a.s. under agreement [VŠE n° 359/VŠ/20] and [SKODA n° SVS-22-098-STR].

Integration of 5G, 6G Networks into Human Life

Tomáš Sigmund

DEPARTMENT OF SYSTEM ANALYSIS, FACULTY OF INFORMATICS AND STATISTICS,
PRAGUE UNIVERSITY OF ECONOMICS AND BUSINESS

sigmund@vse.cz

KEYWORDS:

hierarchy of needs – automated systems – ethics – human life – 5G technology – 6G technology

ABSTRACT:

Given the advantages of 5G and 6G networks in terms of higher data rates, low latency, and higher bandwidth, we can expect improved communication and more connected devices. The fundamental challenge is how we use this advantage of these benefits and how we integrate them into our lives. A. Maslow distinguishes between scarcity needs and growth needs in his hierarchy of needs. Scarcity needs motivate by their absence, they create the necessary conditions for the fulfilment of the growth need which is self-actualization. We will consider both types of needs.

In both these areas of needs the 5G and 6G networks may be useful. They can enable greater automation to meet the needs of scarcity, and through better communication, can also help satisfy self-actualization. Before deploying 5G, 6G networks we must not forget the associated risks that may affect the users. Users may become dependent on automated systems, systems may be difficult to regulate and set up, the world may become

incomprehensible, the responsibility may be delegated to machines and the interests of stakeholders may not be understood. When it comes to better communication options, we may face information overload, lack of concentration, decision paralysis and superficiality.

These problems are not new. In terms of their awareness, we can refer to the ancient distinction among three types of time. The ancient Greeks distinguished between Chronos, Kairos and Aion. Chronos is logical linear time, that is measurable. Every moment is equal every other moment. Kairos means the right moment, the appropriate time and the convenient range. Some moments are different than others. Technologies works in accordance with the chronological time. They are based on quantitative refinement, rules, and models. Within them we can apply teleological and deontological norms and rules. However, human needs Kairos time. Information must be provided at the right time and in right scope. Human autonomy, empathy, creativity, and intuition must be respected. People must not be burdened and overloaded. Technologies should work in an explainable way. Virtue ethics is necessary in the human context. In order to connect and link these two conceptions of the world and time (Chronos and Kairos), we need a metaperspective for which the ancient Greeks had the concept of Aion. Chronos and Kairos are only partially similar. Not all the right moments can be calculated. We should know what we know, what we do not know and what our position in the world is. Then we will understand what we can delegate to machines and what we need to do ourselves and how to integrate 5G and 6G networks into our lives.

ACKNOWLEDGMENT

This work was supported by grant of the SKODA AUTO a.s. under agreement [VŠE n° 359/VŠ/20] and [SKODA n° SVS-22-098-STR].

T-Mobile's Expectations as a 5G Operator

Tomáš Verner

T-MOBILE CZECH REPUBLIC
tomas.verner@t-mobile.cz

KEYWORDS:

5G networks – telecommunication – IoT – campus networks

ABSTRACT:

In the first part the T-Mobile representative presented the technical areas and parameters that the new 5G technology brings to the campus networks. This is the area of enhanced Mobile Broad Band (eMBB) including higher transmission speeds, higher mobility and overall throughput. Furthermore, the area of massive Machine type of communication (mMTC) with high density IoT devices with low power consumption. Last but not least is the area of Ultra Reliable and Low Latency Communication (uRLLC) involving edge computing and network slicing defined based on specific use cases.

In the second part, the speaker then discussed the need to build large partner ecosystems and supply chains consisting of telecom companies, hardware and sensor manufacturers, industry specialists, integrators and customized software solution providers, the use of hyperscale platforms such as AWS, MS Azure and many others.

In the third part, a T-Mobile representative presented industry solutions where the deployment of 5G networks is currently delivering the greatest benefits. According to the operator, these

include manufacturing, transport and logistic, mining, agriculture, healthcare among others.

The final part of the lecture was a presentation of T-Mobile's cooperation projects with the university environment in the Czech Republic where there are currently more than five universities that have installed 5G networks on their campuses where applied research is being conducted with the support of T-Mobile.

Legal Perspectives on 5G & 6G

Roman Kramářík

JŠK ADVOKÁTNÍ KANCELÁŘ

roman.kramarik@jsk.cz

KEYWORDS:

digital services act – data governance act – AI Act – artificial intelligence – IoT – digital services – cybersecurity

ABSTRACT:

Data is the basis for many new digital products and services – many of them connected to 5G/6G networks. For instance, the use of connected objects (Internet of Things) increasingly generates data – and 5G/6G enables their transfers. On the other hand, AI/machine learning needs a lot of data to work properly. Regulation concerning 5G/6G is to a great extent covered by the Digital Services Act, but other current or future acts are relevant, too.

Digital Services Act is focused on intermediary services (especially platforms such as social networks, online marketplaces, goods, comparison sites, search engines) and regulation of content intermediated by these services (uploaded by users of such services). The final act was signed 19/10/2022 and it will be effective 15 months and 20 days after publication. Its aim is to create a safer digital space where the fundamental rights of users are protected and to establish a level playing field for businesses. Other legislation aims to regulate things that are more related

to the future which 5G/6G may/will bring, such as internet of things or artificial intelligence. The regulation of these technologies can be divided into three parts: data, cybersecurity, artificial intelligence. In any case, we mustn't forget law is always far behind digital progress.

In the data area, legislation is focused on accessibility and re-use of data. In this context Data Governance Act (regulation 2022/868 on European data governance, effective from 24/09/2023) and Data Act (proposal for regulation on harmonised rules on fair access to and use of data, expected adoption is 2023/2024) are relevant.

The Data Governance Act consists of three parts:

- 1) Re-use of public sector data – DGA enables access and re-use of data, which are held by public sector but are subject to the rights of others (personal data, trade secrets etc.).
- 2) Neutral intermediation services – The act introduces Intermediation between data users and data holders or data subjects in order to provide secure environment in which companies or individuals can share data.
- 3) Data altruism organisations – It proposes a framework for individuals and companies to make their data available for the common good – voluntarily and without reward. The aim of the Data Act Proposal is to enable access to and re-use of data generated through the usage of connected devices (IoT) and related services.

As for cybersecurity, the law reacts to new cyber threats, increasing dependence on digital technologies, increasing number of potentially vulnerable devices and need for secure use of devices. We mustn't forget NIS/NIS 2 Directive (expected adoption 2022/2023), Cybersecurity Act (effective since 2019) and Cyber Resilience Act (expected adoption 2023/2024). We already know GDPR which affects our life since 2018. NIS 2 Directive addresses for the first-time cybersecurity of supply chains of essential or important services which is of special importance for IoT. The Cyber Resilience Act addresses two main problems: inadequate level of cybersecurity inherent in many products and inability of

consumers to determine which products are cybersecure, or to set them up/use them in a secure way.

In terms of AI, regulation of AI and introduction of special liability rules constitutes relevant topics for the law. This area should be regulated by the AI Act and AI Liability Directive. On 21/4/2021 a proposal for regulation laying down harmonised rules on artificial intelligence was submitted. It introduces special legal obligations according to the level of AI safety risks. AI Liability Directive was proposed on 28th September 2022 and it would create a „presumption of causality“ against the AI system’s developer, provider or user and would make it easier for potential claimants to obtain court orders that mandate disclosure of relevant evidence concerning „High-Risk“AI Systems.

Facebook, Metaverse and 5G, 6G as Enablers for New Services

Antonín Pavlíček

DEPARTMENT OF SYSTEM ANALYSIS, FACULTY OF INFORMATICS AND STATISTICS,
PRAGUE UNIVERSITY OF ECONOMICS AND BUSINESS

antonin.pavlicek@vse.cz

KEYWORDS:

5G networks – 6G networks – metaverse – new services – virtual reality

ABSTRACT:

In this lecture, the author focused on how the new 5G and 6G technologies can help to expand new services, for example Meta's virtual reality world Horizon Worlds.

In the first part, Dr. Pavlicek presented the most popular social networks worldwide (by monthly active users) /Facebook 3 billion, WhatsApp 2 billion, TikTok 1 billion/, their geographical distribution 45% Asia, 10% USA and EU, the rapid rise of Facebook revenues from 2015 to the present (from 18 to 115 billion USD) and also reminded that according to the latest data, the average amount of time spent on social media worldwide is 2 hours and 27 minutes, a day /of which half an hour is on Facebook, while at 46 minutes a day, the platform on which social media users spend the most time is TikTok/.

The next part of the lecture was about Virtual reality – from Second Life to Metaverse. The development of 3D platforms was recapitulated: SecondLife (*2003), Minecraft (*2009), Google Glass (*2013), PokemonGo (*2016), 3D game – Fortnite (*2017),

Horizon Words (*2021). Author also presented main reasons for joining the metaverse worldwide: Work possibilities, Art and Entertainment, Investment, Education, Online dating and socializing, Gaming, Adult entertainment.

At the end of lecture, technological requirements for VR have been discussed: fast symmetrical broadband speeds, low latency (under 10 ms), higher resolution video—4K is not good enough, next generation of video compression that can compress huge data files in real-time, power availability.

It was concluded that current mobile networks are not able to deliver such performance. The metaverse will require more bandwidth. Estimates are, that an ultimate immersive media experience will require somewhere between 2 and 5 Gbps as a typical bandwidth requirement, while for the „ultimate“ experience, packets should have a latency of just 5 to 20 ms, round trip. Such technological parameters can only be brought by the fifth and sixth generation mobile network, thus truly becoming a technological enabler of virtual reality.

ACKNOWLEDGMENT

This work was supported by grant of the SKODA AUTO a.s. under agreement [VŠE n° 359/VŠ/20] and [SKODA n° SVS-22-098-STR].

The Impact of 5G, 6G Technologies on Society: a Sociological Perspective

Anna Novotná

INSTITUTE OF COMPUTER SCIENCE, FACULTY OF PHILOSOPHY AND SCIENCE IN
OPAVA, SILESIAN UNIVERSITY

anna.novotna@fpf.slu.cz

KEYWORDS:

5G technology – 6G technology – society – generation – accessibility – ethics

ABSTRACT:

If we are interested in a sociological perspective of the impact of new technologies to everyday life, specifically the implementation of 5G and 6G communication networks, firstly we need to explain mechanics of sociological generations and their approach to different technological aspects.

Each part of society, each generation, views technology a little differently. Society is not homogeneous in terms of opinion, age, use of technology, and digital literacy. However, we can divide it into generations that are influenced by common interests, certain social, cultural and world events that they share, their access to and use of technology and, finally, the values that guide them. Although we observe certain patterns in the behaviour of different generations, it cannot be said that all members of one generation follow them completely. Rather, there is an inclination towards certain behaviour and preferred ways of using media and technology in each generation.

Technology is increasingly impacting people's lives, whether they actively use it or not! Individual devices are getting smaller and smaller. To what we used to need a mainframe, now we can use a smartphone. At the same time, devices are slowly disappearing from our sight, becoming translucent, transparent, until they disappear altogether. Furthermore, thanks to increasingly natural interfaces and autonomous decision-making, people can get the impression that technology works like magic. Few people today know how the technology really works and what underpins it. Even if a user identifies a technology by its name, it is hard to imagine what is underneath. On the other hand, any technology starts to appear as soon as a device breaks down.

At the same time life shifts more and more into technology. Mark Deuze even speaks of Media life, that we live only when we are inside of them. The question is, what does this do to the generations? Basically, a generation sets its values according to the environment it encounters, the challenges and problems it faces in the adolescent phase of their life. These values are then upheld within. For us to better understand the generation point of view on these changes, we need to know there is a preferred line of work or line of thought among generations and that there are obstacles to overcome.

In this dynamic environment, we need to ensure that preferred values are not lost. We need to ensure that people will be able to consciously and unquestioningly exist in a world that is characterised by the transformation and remediation of things which are offline into things that are online. We need to be able to transfer all the benefits of changing society to all its sections equally and above all positively.

The Impact of 5G, 6G Technologies on Society: Opportunities and Challenges

Kamil Matula

INSTITUTE OF COMPUTER SCIENCE, FACULTY OF PHILOSOPHY AND SCIENCE IN OPAVA, SILESIAN UNIVERSITY

kamil.matula@fpf.slu.cz

KEYWORDS:

5G technology – 6G technology – society – accessibility – usability – job – education – free time – opportunities – challenges

ABSTRACT:

Technological progress is inherent in our society, yet it brings with it several challenges, in addition to opportunities, which humanity has had to cope with. Therefore, we present three areas that can and will be affected by the adoption of 5G/6G technologies, and at the same time will have an impact on the shape of life and society: work, education, and leisure.

Life shifts more and more in technology, which we can increasingly see in companies entering the Industry 4.0 era. Through the means of smart cities, smart homes, datafication of life, we are and will be able to gain detailed information about our surroundings and society. This will lead to improved services for residents, e.g., we will be able to better coordinate urban repairs, necessary changes in infrastructure, education, service provision and many other areas. But at the same time, we will have to face new challenges in terms of privacy, changing mind-

sets, technology taken for granted in everyday life and technological apathy.

In terms of the labour market, many jobs will be replaced by robots and artificial intelligence. It is necessary to support people who lose their jobs, and to prepare for possible secondary effects of unemployment – increased crime, the impact on physical and mental health, the widening gap between rich and poor, and much more. Probably, there will be a streamlining of production processes and GDP growth, hence an increase in living standards (at least for some groups in society), as we know from previous industrial revolutions. 5G/6G technologies promise not only greater speed, but also lesser latency, connection reliability and service availability. This brings us to another value that Generation Y professes – remote control. Whether it's connected to fast and efficient communication to control your environment or to improvement of your comfort. Particularly within the elements of smart homes, heating, energy saving, remote control of cars etc. Of course, there are other benefits that the society wants to reap – unlimited access to data, streaming data in high quality, maximising the potential of voice assistants, wearable electronics, etc.

The last few years have also been a big test for society in the field of education. Distance learning readiness has proven to be less than perfect, but the current technologies allowed us to do it anyway. Thus, we can expect a shift in education as well based on the adoption of 5G/6G technologies – integration of immersive technologies in teaching, moving from e-learning to v(r)-learning, changes in curricula at all levels of education that should deeply consider technology literacy and ethics.

This presents us with many challenges. What is the user experience, and what are their expectations of new technologies? The experience has long since become not just about speed and efficiency, but also about convenience and not having to intervene where it is not needed. For all types of technology users, the accessibility and usability of new services will be crucial, as their interfaces will have to fit into miniature displays or opera-

te completely independent of human intervention. Every step we take in this technological environment will be recorded and used to evaluate various practices and changes. We will move more in the direction of reality to virtuality...

Using 5G Networks for Diagnostics in ITS

Tomáš Tichý
Tomáš Šmerda

DEPARTMENT OF TRANSPORT TELEMATICS, FACULTY OF TRANSPORTATION SCIENCES, CZECH TECHNICAL UNIVERSITY IN PRAGUE

tomas.tichy@cvut.cz

tomas.smerda@cvut.cz

KEYWORDS:

5G networks – transportation – diagnostics – industry 4.0 – telematics

ABSTRACT:

The purpose of the presentation is to present intelligent transport systems (ITS) as a field that integrates telecommunications and information technologies for control systems in the city and on highways, as well as from the point of view of using 5G networks for predictive fault diagnostics in those systems. The requirements and needs of transport and technological infrastructure administrators are mainly the optimization of operating costs and maintenance, which form a significant part of the financial costs after the introduction of ITS systems. Intelligent transport systems are often distributed over larger areas, from which you need to obtain not only basic control and information data in high quality, reliability, and low latency, but also diagnostic data. An example can be obtaining traffic data from drones, information from light-controlled intersections, parking systems, but comparing data with the digital twin of the given

traffic system or applying it to urban Mobility Hubs. This information and ITS data lead to processing a large amount of transmitted data, where 5G meets the demanding requirements of customers and administrators of ITS technology. New trends in the extraction of data from real traffic and on-line diagnostics extended by predictive algorithms are beginning to be significantly applied in Industry 4.0, where faster transmissions in practice using 5G using simulation, system interconnection, visualization in add-on applications, and their mutual interconnection and optimization lead to higher efficiency of activities for planning, determining the life cycles of equipment and fulfilling the needs of the circular economy. This knowledge is successfully being gradually adopted precisely in the transport systems. The application of 5G networks for diagnostics in ITS fulfills the essential needs for data transmission, the necessary data security, and the necessary real-time processing that transmission technology can offer. The presentation approaches all these topics from the perspective of telematics systems that are used in transport, and we encounter them every day not only in road and rail transport, but also in air and water transport.

Main Ethical Dilemmas of 5G/6G

Jiří Korčák

DEPARTMENT OF SYSTEM ANALYSIS, FACULTY OF INFORMATICS AND STATISTICS,
PRAGUE UNIVERSITY OF ECONOMICS AND BUSINESS

jiri.korcak@vse.cz

KEYWORDS:

5G networks – 6G networks – ethical dilemma – new services
– virtual reality

ABSTRACT:

To understand any ethical dilemmas, it is first important to be clear about the area of debate. Many disputes arise from the ambiguity of the level of debate and from the confusion arising from individual understandings of the meaning of the issue. Indeed, the paradigm of ethical dilemmas can be divided into dichotomous pairs of words that are in opposition to each other in meaning. These pairs are Truth vs. Loyalty, Short-term vs. Long-term, Individual vs. Community and Justice vs. Mercy. Thus, in each pair, we have the issue of several kinds of thinking and decision-making coming together. We could summarize these types of decision-making under the terms Care-based Thinking, Rule-based Thinking and Ends-based Thinking. This clarification of terms helps us decide how and in what ways ethical dilemmas arise and how to approach them.

The issue of ethics as such is an important topic at the moment. This is evidenced by the fact that the study of European Parliamentary Research Service on 5G from March 2022, prepared

by the Scientific Foresight Unit, identifies ethics as one of the Impact assessment categories. In this study, based on documents of specifications, quantitative and qualitative analysis of information and feedback of user and stakeholders, and on case studies, the authors conclude, that with new technology (specifically 5G networks are mentioned, but could be generalized) and its adoption come 4 impact categories. These categories are the technology itself, privacy, security and ethics/politics. The study also comes up with 2 ethics concerns to which it offers a response as adequate policy. These policies include the promotion of trustworthiness of actor in system. Thus, at this point, one of the basic dilemmas of game theory can be presented: the prisoner's dilemma.

In our paper we show what other ethical dilemmas can be found in case studies of 5G and 6G networks. The selection of case studies is based on the aforementioned study, but also on other traditional uses. These case studies are: blockchain in E-healthcare for electronic healthrecord and better drug research and supply chain; Communication of a vehicle to everything in system for reduction of road traffic injuries; drone based airborne communication base stations for supported decision making firefighting and in general extension of terrestrial network coverage and capacity; real-time data usage on all places of production and supply chain for better farming and agriculture usage of natural resources and for ecological reasons and lastly Internet of senses for verification and merged reality UX. These case studies we link with traditional concepts and dilemmas as Red Queen Hypothesis, Commons dilemma (Tragedy of Commons) and its trust based counterpart Stone Soup dilemma; and Imagined Order by Y.N.Harari.

Closing word

We'd like to thank all speakers of SEP 2022 conference for interesting presentations and participants for challenging discussions. It was a nice event spent in friendly atmosphere.

We have seen how revolutionary the 5G, 6G networks will be. They will change our life, allow many innovations, but it will be very important how they will be integrated into human life. We already know many use cases where 5G, 6G mobile networks play the role of enablers. Without them the solutions would not be possible. There are many situations where we need quick reliable mobile network because the fixed connection is not available, such as in the open countryside or in case of traffic constructions. An area where the high speed of information transmission will be necessary is the operation of autonomous vehicles or virtual reality represented by the metaverse project. However, the changes caused by new 5G, 6G mobile networks will not be technical only, they will be deeper and will surely affect the society and its generations, labour, living, education etc. The impacts are not always positive and uncontroversial which can be illustrated by the attention paid to 5G, 6G networks by the law. Mobile networks are and will be legally regulated in order to mitigate their negative consequences and threats. We mustn't forget the ethical controversies and dilemmas we will face in relation to new mobile networks. Many of them have no clear-cut solutions and we must be prepared for that. The role of information literacy and metaliteracy is irreplaceable.

We can conclude that 5G, 6G mobile networks connected to other technologies will change our world radically. We must be prepared for the new and may not forget lessons from the past. The future can be successfully shaped by the prepared ones.

Mgr. Ing. Tomáš Sigmund, Ph.D.



T Mobile



WE WOULD LIKE TO THANK OUR PARTNERS