



GTPRN March 2022 Newsletter

Welcome to the GTPRN March 2022 Newsletter

And WE ARE BACK 😊

This issue is all about innovation, new concepts, and perhaps a taste of the future. Our first exclusive article is from Dr. Ahmed Shalaby, a time digitalization expert, and the founder of the Human Information Laboratory (HIT Lab) on WEB3, a new generation of the Internet based on blockchain technology. In a nutshell, the article addresses unfamiliar terms such as ‘Healthy Digitalization’ which deserves more attention given that the author is a heart surgeon himself. You can check his article at the GTPRN [website](#) or by the end of this newsletter.

Dr. Shalaby is a heart surgeon residing in Finland and the author of Learn Innovation Your Style and WEB3 Case Use. He founded the Human Information Laboratory (HIT Lab) to develop the Maestro Network to automate the Balanced Growth Theory.

Our second article is from Prof. Marko Höyhtyä, New Space Co-Creation Manager at the VTT Technical Research Centre of Finland Ltd, entitled “Sustainable multi-layer satellite communications in the 6G era: Integration of networks”. The article provides a glimpse of the near future where 6G would be part of our daily life and users terminals will get connectivity from satellites as well as traditional terrestrial networks. You can check his article at the GTPRN [website](#) or by the end of this newsletter.

Prof. Höyhtyä received the D.Sc. (Tech.) degree on telecommunication engineering from the University of Oulu, where he currently holds associate professor position. He is an associate professor at the National Defence University as well. His research interests include critical communications, autonomous systems, and resource management in terrestrial and satellite communication systems.

Prof. William Webb is back with another sight onto our digital future. Please check his article [here](#).

Below are the main publications on telecom policy in the last months:

- March 2022 issue (Volume 68) of Telematics and Informatics
- Volume 46/2 (March 2022) of Telecommunications Policy
- January 2022 issue (Volume 66) of Telematics and Informatics

There are several related telecom policy vacancies as follows:

- Ivey Business School is seeking applicants for the inaugural Chair in Telecommunication Economics, Policy and Regulation at the rank of Associate or Full Professor (tenure) or Assistant Professor (tenure-track). Ivey is part of Western University, located in London, Ontario. More details can be found [here](#).
- The Media & Internet Governance Division (Prof. Dr. Natascha Just) at the Department of Communication and Media Research at the University of Zurich invites applications for a position of senior research and teaching associate/postdoctoral researcher. More details can be found [here](#).

You don't want to miss the next ITS webinar "The Future of the Internet" by one of the fathers of the Internet, Vint Cerf, on 12th of April 2022 which will be host by the Munk School of Global Affairs and Public Policy and TELUS Communications. More details can be found [here](#).

We are thrilled to have Prof. Moinul Zaber joining our editor team. Prof. Zaber is currently a Senior Academic Fellow at UNU-EGOV. He is a data and computational social scientist. His research focus is Artificial Intelligence and Telecommunication technology for public policy. He uses machine learning, statistical inference, econometrics, techno-ethnographic analysis and design thinking to harness data for policy insights and intervention design. You may check his bio at the end of this newsletter.

GTPRN invites our young scholars to apply to the 2023 PTC Emerging Scholar Program whether they are actively enrolled doctoral (Ph.D.) students or hold a postdoctoral position. The Emerging Scholar Program aims to recognize, encourage, and support up-and-coming scholars in the telecommunications and digital infrastructure fields. The deadline is on 5th of August 2022 and questions could be directed to emergingscholar@ptc.org.

Finally, please share with us and with the GTPRN community your articles, views, news, announcements. If you have a specific topic that you want to share an update or opinion on in one to three pages, please do not hesitate to share it with us via news@gtpn.org

Kindly also help us by spreading the word about the GTPRN community and forward this newsletter to your colleagues or students. We have now 170 scholars and practitioners who share the interest in telecom policy, and we can only grow with your help and support. You are more than welcome to join our Facebook or LinkedIn Groups, follow us on twitter @GlobalGtpn, or to subscribe directly to our website www.gtpn.org where you have the chance to comment on each article or post.

Take care and stay safe.

Mohamed Hafez

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What is NEXT in WEB3?

Ahmed Shalaby M.D., Ph.D.

Time Digitalization Expert and Heart Surgeon

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The current Internet and digital economy are a double-edged sword. The greatest and most worrying danger is the disruption of the mental¹, physical² and cognitive development³ of the younger generations.

The concept of WEB3 was introduced few years ago, the first thing that will come to your mind when you hear “WEB3” should be one of these buzzwords: decentralized web, token economy, smart contract, and blockchain technology.

To sum it up, WEB3 is a new generation of the Internet based on blockchain technology. And if you are interested in being more familiar with the foundation of the concept. There are many books out there, but the best I have read so far is not a book but rather the popular online document “The Unofficial Translation and Application of a Government Report to the Parliament of the Principality of Liechtenstein regarding the elaboration of a Law on Tokens and Providers of TT (Token Service) Provider and TT Act; TVTG (Blockchain Act)⁴.”

If there's anything that should be new in WEB3 concept, this will include two things: #1 a WEB3 application which takes into account the potential of the 5G, 6G, token economy as well as the risks, and this should be in place from the start, before it's too late. #2 Placing the user in a fair position as one of the primary beneficiaries of the earning model rather than as the core of the business model.

The Most Urgent Hazard of Digitalization

Unfortunately, the most serious and damaging risk is receiving less public attention, although it should be at the center of attention when discussing digital risks. This risk is a process called *rapid modification of human behavior on a large scale and in a very short time*. The effect of this modification is no less harmful than that of drug addiction.

¹ [Children & Young People's Mental Health in the Digital Age Shaping the Future](#)

² [Skrzypek, Elżbieta. "Digitalization along with 5G and 6G Networks–Determinants and Consequences." Annales Universitatis Mariae Curie-Skłodowska, Sectio H Oeconomia 55.1 \(2021\): 51-66.](#)

³ [Digital dangers The impact of technology on the sexual abuse and exploitation of children and young people](#)

⁴ [Tokens and TT Service Provider Act;TVTG](#)

Its severity is primarily related to age. In principle, the younger the age, the more devastating the damage. At the individual level, this damage is expressed by the degree of a person's underperforming (cognitive impairment).⁵

That's not all, what is even more serious is the reflection of this impairment on the mental health. For example, there is unprecedented increase of stress levels in the very young age and teenagers: You can easily detect it in kindergartens, schools, and mental health clinics. These groups have become dysfunctional as we speak and before even starting their actual life. There is a variety in the degrees of dysfunction ranging from a passive attitude towards the future up to living a life where one has to be fed by gastro-intubation. Some others resort to self-injury to relief stress, or attack others.⁶

Bilateral Aging of the Population

The effects of this level of stress will certainly point impact the number and wellbeing of the people. There will be sudden and deep declines in the demographic structures, due to a new phenomenon called bilateral aging. This means young people are treated in the community as well as old people after their retirement. Young people will be considered to be retired even before they go to the work life. They will not be able to socialize. Instead, they will be mentally and physically passive and not capable to do any kind of work. They will be in the receiving end of care and benefits in the same way as the old, retired people.⁷

If the countries have been earlier suffering from the welfare sustainability gap, the phenomenon of young people aging due to the digitalization hazards will take any hope to overcome this gap forever.⁸ I had to clarify for you the urgency of this particular digital hazard of modifying the human behavior, because any other talk to address the potential of digitalization technology, economical or privacy concerns would be insignificant if we are not paying attention to the most critical hazard.

⁵ [Combating digital addiction: Current approaches and future directions](#)

⁶ [internet addiction and its impact on physical health](#)

⁷ [How Does Technology Addiction Impact The Brain?](#)

⁸ [Global Debt Reaches a Record \\$226 Trillion](#)

Healthy Digitalization Is The Starting Point To Limit All The Possible Digital Hazards

Healthy digitalization is an umbrella term for all the practice of developing human centric digitalization which enables people growth. This growth should be balanced and cover all aspects: mental, cognitive, psychological, economic, financial, welfare and peace.

The scientific theory behind healthy digitalization is called the *Balanced Growth Theory*., Its technology concept is called *Growth Media* and the actual application is called the *Maestro Network*. The Maestro Network is a new generation of AI based decentralized internet WEB3, which should coordinate and connect all the personal, private and public (PPP) digital and physical activities since birth till death all the time.

Maestro is a country specific WEB3 network solution. Each country has to have one Maestro Network. Multiple Maestros can form one true digital marketplace e.g. for the European Union or any other union of countries. This means every country will have two forms of existence: one is physical and the other the physical's digital twin. The efficiency of the Maestro Network is to monetize the data of PPP around innovation process bringing different values for all the stockholders.

Maestro Network In Nutshell

[Why to have a Maestro?](#)

Everyone has valuable things like money, land, and assets. You need a bank and an asset manager to take care of your valuables. Data is now more valuable than ever. Data is the new asset to be treated like any other valuables. It needs a bank and stock market, and you need an automated asset manager to take care of your data. Maestro should be able to provide a data monetization service.

[What is Maestro?](#)

The Maestro brings the principles of the financial market to the data world, such as data bank, data stock market, talent stock market, data investment, data security, and data tax. Like in any assets, there are data assets that are volatile, fixed or permanent. It is all about continually evaluating the current supply and demand and its relevance in the market. Each business or general entity and every citizen will have a bank account since birth.

[How will it actually look?](#)

Maestro will create data banking technology and there will be many licensed banks to deal with these accounts and transactions according to users' preferences. There

will be different types of banks or departments with different rules for different types of accounts including e.g. personal, institutional or public accounts. Maestro will take care of interbank cooperation and data stock market management.

What are the benefits?

The data stock market is the new marketplace for transactions between businesses and talents. Based on these transactions, people can sell to businesses, and nonprofit public services such as education, health or social affairs can also generate revenue. Individuals will get a new revenue stream and a basic lifetime income in addition to their existing income. Other indirect monetary value of the data will make it possible to reduce the cost of welfare and increase business efficiency.

To reach the potential of the Maestro network, a new multidiscipline digitalization centre (Human Digital Innovation Lab) should be established. Its main focus is on practical innovations in order to close the gap between the academia and commercialization right from the start with taking into consideration the needs of the citizens, decision makers, and policy makers as well as the future trends of the technologies. This kind of centre should in one place take into account all aspects of the digitalization: mental health, social, economic, financial, ethical, security, and political.

Ahmed Shalaby M.D., Ph.D.



System Analyst | Welfare Digitlization | Digital Economy
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Innovation Psychology | Heart Surgeon.

Ahmed is an Egyptian heart surgeon residing in Finland. He is the author of *Learn Innovation Your Style* and *WEB3 Case Use*. He became a full time digitalization expert and a systems analyst In 2008. Shalaby founded the Human Information Laboratory (HIT Lab) to develop the Maestro Network to automate the Balanced Growth Theory.

Sustainable multi-layer satellite communications in the 6G era: Integration of networks

Marko Höyhtyä

New Space Co-Creation Manager and Associate Professor
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Satellite communications and terrestrial mobile communications systems have been traditionally designed and operated as distinctively separate systems. During third generation of cellular technology (3G) first steps toward convergence of satellite and terrestrial systems were done and the satellite air interface was made compatible with the terrestrial universal mobile telecommunication system (UMTS) infrastructure. In 4G, satellite systems have been used to enable global roaming in places where terrestrial 4G network is impossible to be installed or too expensive. During the 5G the progress is continuing and there are real promises of having wide-scale use of integrated systems in the future.

What will integration of networks mean for the end users and operators? First of all, a joint radio interface for terrestrial and satellite link would mean that we could use the same handheld to connect via satellite in any location, also outside terrestrial coverage. There are still plenty of locations where building the terrestrial infrastructure is not economically feasible - or not possible at all such as in marine environment. The ability to use same equipment without the need to buy specific satellite terminals would reduce barriers in adopting the technology and provide resiliency and higher feeling of safety also to consumers e.g. during hiking trips in remote locations. Secondly, it is possible to create private networks for public safety use, harbor areas etc. and use satellites as backhaul connections to connect those private networks to outside world.

Now the research community is already looking actively towards 6G networks. The aim is to enable new applications, increase capacity, reduce latency and provide even higher mobility compared to previous generations. One of the planned aspects is that the vertical dimension and the integration of terrestrial, aerial, and satellite networks is taken into account in the network design and operations from the beginning, leading to the three-dimensional (3D) architecture (Dang 2020, Höyhtyä et al., 2022). Therefore, 6G systems can be tailored to

support both connectivity and positioning needs of future users and applications accurately and efficiently.

In addition to technical advantages, the 6G systems are designed with sustainable development goals in mind. The multi-layer systems are developed from economic, social and environmental viewpoints. There are currently large satellite constellations under development aiming to provide services to developing countries, enabling remote healthcare, and supporting e-learning e.g. in Congo. From the environmental viewpoint satellites can help to preserve Arctic areas since no terrestrial infrastructure need to be built in the fragile environment. In addition, increasing number of satellites in the orbit should not increase the space debris in a way that endangers satellite services to future generations.

From the frequency point of view, there are many challenges ahead regarding the spectrum management for 6G systems in order to be able to support needs and ensure interference-free operation to existing systems. Dynamic spectrum management needs to be updated to the 6G era. There are many topics to be addressed to make this successfully. First, defining the most suitable frequency bands for systems and links. Second, developing spectrum sharing mechanisms to manage the complexity of a dynamic and mobile 3D network. Most probably, artificial intelligence-based solutions are required. 6G SatCom related spectrum sharing may include spectrum coexistence a) between different satellite systems, b) between satellite and terrestrial systems and c) between systems in different layers of the multi-layer network. There have been studies on database-assisted spectrum sharing operations and predictive approaches where e.g. licensed shared access has been studied (Höyhtyä et al., 2021). However, plenty of technical studies and regulatory decisions will be required to enable visions shown by the research community.

References

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Marko Höyhtyä received the D.Sc. (Tech.) degree on telecommunication engineering from the University of Oulu, where he currently holds associate professor position. He is an associate professor at the National Defence University as well. He is currently working as a New Space Co-Creation Manager, coordinating space technology research at VTT. He was a Visiting Researcher at the Berkeley Wireless Research Center, CA, from 2007 to 2008, and a Visiting Research Fellow with the European Space Research and Technology Centre, the Netherlands, in 2019. His research interests include critical communications, autonomous systems, and resource management in terrestrial and satellite communication systems.



Moinul Zaber is currently a Senior Academic Fellow at UNU-EGOV. He is a data and computational social scientist. His research focus is Artificial Intelligence and Telecommunication technology for public policy. He uses machine learning, statistical inference, econometrics, techno-ethnographic analysis and design thinking to harness data for policy insights and intervention design.

Dr. Zaber received his PhD in Engineering and Public Policy from the Carnegie Mellon University, Pittsburgh, PA, USA. He is currently on leave from his position as an Associate Professor of Computer Science and Engineering, University of Dhaka, Bangladesh. Previously he worked as a Research Fellow at Economics and Management Department of Chalmers University, Sweden, Instituto Superior Tecnico, Portugal and LIRNEasia, Sri Lanka. Dr. Zaber, has also served as a visiting Associate Professor at CSIS, Tokyo University, Tokyo.

Moinul has 16 years long experience on conducting research focusing computational science. His recent research is on development of quality of life indicators from non-traditional data, enhancing explainability and reduction of data-bias in AI systems, use of Big Data to understand electricity usage at the urban setting, use of GPS data for traffic pattern recognition, complex network analysis of river and road connectivity pattern, digital inclusion at educational hubs, use of deep learning for satellite data on land use land cover, spectrum allocation and pricing policy, digital transformation of emergency services, voice over IP regulation, regulatory governance for technology management, usable privacy and usable security. Moinul is one of the editorial board members of Telecommunications policy journal and served as program committee member of various international conference committees.

He has published in various international peer-reviewed journals, taught at various governmental and non-governmental institutions, regularly gives invited talks at major conferences on AI, ICT, Telecom and regulation.