LMT provides a high-capacity data network for scientists to help battle cancer and combat the COVID-19 crisis

LMT and MikroTik, two Latvian tech innovation companies, have recently provided a high-capacity data network to local scientists. The network offers a 10 Gbps data transfer rate that significantly decreases the amount of time needed for genome data relocation. The digital size of a genome is measurable in hundreds of gigabytes, and increasing the data transfer rate can significantly accelerate the work of scientists battling with COVID-19 as well as conducting research projects on cancer and other severe diseases. Enabling scientists with such a high-capacity data network is a significant step towards further development of 5G solutions for medical and scientific purposes.

Modern research relies on massive analysis of extra-large data, which emphasizes why high-capacity and high-speed data connections are crucial between research facilities. Currently, the size of a single genome's data set is massive – around 100GB – and it's estimated to reach sizes of tens or even hundreds of terabytes in the near future. The transfer of such extra-large data sets has taken a vast amount of time, effort and human resources, which has impeded research in Latvia. Previously, the procedure of genome data transfer took several days, which was sometimes sped up by physically transporting the data between locations on external drives. Now, however, the digital transfer of a single COVID-19 genome project takes mere minutes.

The high-capacity data transfer solution created by LMT and MikroTik hastens data analysis and gives researchers unprecedented advantages. Both companies are closely collaborating with scientists and research facilities so that their solution can meet the needs of medicine and health sciences in Latvia.

The Health Minister of the Republic of Latvia, Ilze Viņķele praises the high-capacity data network as a significant project of digital transformation in the health industry: "Latvia has great doctors, scientists, and highly developed technologies. This project is another confirmation that with the involvement of both public and private sectors it's possible to achieve a result with a broad future impact on society. The contribution of private tech companies alongside the governmental input into gene technology will save many lives and this investment is invaluable."

The president of LMT, Juris Binde, highlights that smart tech is already present in research, diagnostics, and treatment. However, increased access to such tech across all levels of the health system is key for speeding up the diagnostics and treatment of diseases and enhancing life expectancy. The president of LMT, the leading company in the Latvian IT and communications industry, is sure that the input of tech companies and their collaboration is crucial for making progress in medical innovations and discoveries. By having access to cutting-edge technologies, local scientists can benefit from unprecedented advantages in the research process of cancer, COVID-19, and other diseases. That's why maintaining close collaboration between tech developers and scientists is crucial. Moreover, LMT is also one of the ApturiCovid app developers and is carrying out an initiative called "Veselai Latvijai" in an effort to implement the digitization process of Latvia's biggest hospitals.

John Tully, the co-owner and head of the board of MikroTik, adds that creating the high-capacity data network is one of the initiatives from tech companies to support the Latvian medical system, and invites other partners to join in. MikroTik supports the Children's Clinical University Hospital and is taking part

in a project by the Latvian Biomedical Research and Study Centre, which aims to help children battling cancer.

Valts Ābols, head of the board of the Children's Clinical University Hospital, explains that with the support of MikroTik the project's ambition is to enable full sequencing of new cancer patient genomes that would allow choosing and adapting the best possible treatment for each patient. The high-capacity data network and implementation of 5G-based solutions could not only provide a fast genome data transfer but also significantly speed up other key processes such as transferring other kinds of extra-large data, connecting and monitoring remote systems and devices, developing virtual and augmented realities for medical and research purposes, and many more. The network solution is not only crucial for improving healthcare and medicine quality and possibilities but is highly influential in the research processes of these fields that can enable a significant level of disease prevention in the future, too.

The high-capacity data network provided by LMT and MikroTik has been established between the Latvian Biomedical Research and Study Center, the Children's Clinical University Hospital, genes sequencing center "Latvia MGI Tech", and the High Performance Computing Center of Riga Technical University that processes the extra-large data. Next to join the network are the University of Latvia Academic Center for Natural Sciences, Riga East Clinical University Hospital, and Riga Stradina University Medical Education and Technology Center.

"Modern technologies not only facilitate the ongoing gene research process but also widen the range of new possibilities. Meanwhile, these researches and innovations call for large-scale investments because extra-large data analysis requires extremely powerful computer hardware that is expensive both in terms of acquisition and maintenance. For this reason collaboration between research facilities is essential. The shared use of such high-powered technology benefits everyone who's involved in research as well as society overall; however it can only be effective if it's complemented by a unified high-speed data transfer network. Because of LMT and MikroTik, such a network is now available for the gene research facilities in Latvia, and that's a tremendous step forward," indicates Jānis Kloviņš, the director of the Latvian Biomedical Research and Study Center.

Alongside cancer research and research on the coronavirus disease, Latvian scientists are actively studying other diseases. For example "Latvia MGI Tech" is carrying out several internationally influential projects on inherited diseases and neuromuscular disorders of unknown etiology.

The societal benefit of the newly-launched high-capacity data network is even greater on the long-term scale and extends beyond the healthcare industry. The network's infrastructure will add significant support to the ongoing collaborative projects of the Latvian Biomedical Research and Study Center. For example, current projects, headed by the University of Life Sciences and Technologies of Latvia, are focused on the genetic characterization of local goat and sheep breeds and on the research of the interaction between berries and their pests. Both projects are operating with large-scale data and will greatly benefit from the high-capacity data network.