Perspective

The Growing Craze for 5G Spectrum and beyond is intensifying

The expectations are big. With the fifth mobile phone generation (5G) the net provider and management finally want again to generate the transaction and to turn out to be the new business models for other industries. For the automobile branch 5G turns out to be like the most important technique as Alfons Pfller, manager development with Audi announced in the second week of October 2016 at the meeting of NGMN-Alliance (Next Generation Mobile Network). Whether the net linked vehicles or for the digital transformation in the production places – all set on the properties of coming mobile phones. It might be totally otherwise than the telecommunication generations be before that. It goes not only with higher speed and other antenna techniques but also with real mechanical communication, real G-bytes transmission and with extremely small delay as clarified by Samsung Chief Technologist Kyungwhoon Cheun. Also the characteristics which other industries demand are that 5G should take care 7 milliard persons and still more machines worldwide with 99.99% reliability.

Applications for 5G

- Broadband in Metropolis Video everywhere
- Broadband access everywhere – 50 M-byte/ second everywhere
- Higher mobility – high speed train
- Complete internet of things: sensor networks
- Right authentic communication: tactical internet
- Emergency communication: natural catastrophe
- Extremely reliable communication: telemedicine e-Health
- Transmitter analogous service – Radio Service

Eight differing application cases: The researchers and developers for the standardization of coming mobile phone generation 5G have defined. The requirements for broadband, signal transmission line as also the mechanical communications are very high.

In the summit meeting of chief technologies on mobile phone regarding 5G (the fifth mobile generation) the provider and managers introduced totally new challenges. The chief technologists who in the second week of October 2016 in Germany discussed on progress and perfidies of development certified that.

The future sensor network: smart cities in which street lighting and lighting houses up to energy and water supply all are internet connected, are the scenery for the internet of things that is possible only with 5G.

In short the coming 5G nets are highly complex creation. As per Samsung expert Kyungwhoon with the third or fourth generation mobile phone, it no more goes with higher speed only or new antenna techniques. It goes with right machine communication, real G-byte transmission and with extremely small delay.

The automobile manufacturers have made it ahead. In the next weeks of October-November 2016 the other branches should have followed and cooperated with mobile phones such as sports, health, energy and the production industries are ready and time is pressing. Before all in Asia the Koreans want to exhibit the first applications in the Olympic, winter-sports in the year 2018. The Japanese are ready and want to put in operation commercially in summer in 2020.

There are many technical perfidies which in the coming years must be solved. Base is sufficient in spite of all expectations and hopes a pair of warning words is to be placed in positions. We must be cautious. All steps which we are now making must be safer – Maloberti of Orange emphasized. Finally

it goes round a technique which for years placed the bases.

Still human being moves about in unsafe areas-observes Johan Wilberg, the chief technologist of Vodafone group. Man wanted new data highways to generate but he must take the right path. He warns everyone and all who very strongly push forth through the ides. Nine months are still required for a newborn. The same is valid for 5G. We should not bring it in the world before it is ready.

South Korea springs in 5th Generation mobile phone. 2017 will be an exciting year for 5G in South Korea. There during the winter Olympic Games at the beginning of 2018 a first network in the 5th mobile phone technique should generate. An ambitious design that the Asians compare already now boldly with the first landing on the moon. The Korean industry claims when it goes with 5G the 5th mobile phone generation. The challenges for that are of a big type that the vice president of the network technology unit with Korean net management Korea Telecom (KT), Mr. Jae-Yoon Park has compared this publicly boldly with the first landing on the moon.

The leading telecommunication providers along with the official Olympic partner (KT) also S K Telecom and LG Uplus of Korea are strongly convinced of that they will be successful with the debut of the new mobile technique by February 2018. We believe that Pyeong Chang will be the first 5G Olympic Games – clarified Park and that although the Koreans know that final standardization questions as the delivery of frequencies in bi positioned GHz region first should be solved at the end of 2019 at the world radio conference in Geneva. It will deal with the show placed 5G techniques about a prenorm – Byung-Moo Lee admits. The vice president of Olympic Business with Korea telecom speaks of that the technique of the winter games is compatible with the 1st phase of standard.

The objective of KT is to test diverse coming 5G techniques in the winter sports. With virtual 360 Reality Videos, sports fans should be able to watch the competition still reality. On a new network service named sync-view the performance should be negotiated to the spectators that they are direct part of the happening.

2018 is an important year for the fifth mobile phone generation, in short 5G and this is not only that, the Koreans will exhibit the first application of it in the winter Olympic to be held there.

2018 will show how the up-to-date research activities are transformed in realistic scenery. So the Swedish telecommunication giant Telia together with Intel and Ericsson have its public 5G-test network switched on. The German telecom tests in Berlin the multi-antenna technique Mimo. 3D beam forming with the antenna signal is sent accurately to the end receiver. This belongs to the future technique. Many a person waits the network slicing with which the infrastructure flexibly adjusts to the requirement of the user as the key for 5G. Others think already of the sixth generation 6G. Fraunhofer experts of the Institute for applied solid state physics (IAF) research in the framework of EU projects Terranova on 6G mobile phone. At the end of 2019 a team wants to insert there Terahartz radio technique in glass fibre nets with high data rate and to make accessible new frequency bands.

Therefore as for example a small camera at the helm of a bob riders, gives high resolution live pictures with a speed of 150 km/hr on the screen.

In preparation of that test network should be built up in five regions namely in capital city and cities like Seoul, Pyeongchang, Zeonseong, Bogwang and at the international airport of Inchon. The technicians set up along with multiple antenna technique "Massive Mimo" (multiple inputs, multiple outputs). Here hundreds of antenna come for start which brings in an increase higher speed of wireless data transmission guarantees a higher reliability and along with that should offer a better manifold use of the existing spectrum.

"Higher jump of data and short latent periods belong to the big challenges" emphasizes KT expert Park. Therefore his opinion is of an art of revolution on the basis of a new architecture and necessary for a new radio access technique. KT works for that on numerous new technologies which should help the mobile phone offerers introduce their resources efficiently. The network virtualization belongs to that among others, with which different nets are collated to logical units.

KT wants to lay glassfibre cable nets with

a total length of 1391 km in various places of Pyeongchang. Park says "We do not know as yet whether sufficient implements will be placed at our disposal in order to get the 5G technique really to come to shape". KP works together with big indigenous implement manufacturers as Samsung and LG. the priority lies on Smartphone but one thinks of tablets and others.

Simultaneously further more that 5000 WLAN entry points should be installed and on small cells a mobile communication net should be made ready to which upto 250000 pieces of apparatus can be connected.

The undertaking will set up additionally a data centre in the cloud in the surrounding of Olympic Games places in order to guarantee with that the efficient and reliable mobile phone service. Three control stations in Gwacheon, Bussan and Gunsan should work together in order to ensure a smooth picture transmission confidently. Competitor S. K. Telecom is not less ambitious with regard to the quick introduction of 5G. The biggest Korean tenderer has opened an innovation centre in its own research centre at the perephery of Seoul. "Our goal is that at the end of the year in to connect the key technologies for 5G in order to start a pilot system the outer region" says Park Jin-Hyo, Manager of the network R&D Technology centre. Precommercial tests were planned in 2017. At the end of the coming year a chip should be available for a 5G apparatus in tablet form.

Asian branch experts are of the opinion that seldom any other country is prepared to such an extent as good as South Korea. In a most recent ranking of finance agent Bloomberg, South Korea was treated with the view on the density of scientists, investments in research and development as also the number of patents as the most innovative land worldwide.

The network arrangement of South Korea is without examplary. New buildings are according to standard linked to glass fibre. These nets are thought of for broadband service. First of all these days SK Broadband was announced that in cooperation with Nokia receives first private household extremely fast glassfibre connections with 525 Gbytes. The objective is by the year 2020 to offer 10 Gbitses to all the citizens. The expansion of glass fibrenet stands in good lead to the corenet of the fifth mobile phone generation.

To add to that the Korean government promote digitization extremely well. The ministry of science, MSIP announced in September 2015 for the IT industry about 1, 16 milliard $ should be kept ready (fund to be provided). The plan covers up strategic sector 5G, the internet of things cloud computing and more.

Korea's R&D works are increasingly worldwide integrated. European next experts ahead of all Nokia, however, also Ericsson and the German Telekom are important partners with that. Parts of 5G research in Korea are financed by EU. In the year 2014 the EU came to an agreement for cooperation with respect to the develo0ment of mobile nets of next generation. As a part of this cooperation latest the centre for wireless communications at the Finnish University Oulu are with that empowered to develop 5G radio techniques and their integration in mobile radio network for the insertion in the Olympic winter sports.

5G comes sweepingly quick

Mobile phone: Already 1 milliard people will use the new mobile phone 5G. That is the result of the recent Eriksson Mobility report. Accordingly 5G radio network start as the first in the densely populated cities and will cover up at the end of 2023, 20% of the population worldwide. First commercial 5G installations among others are set up in USA, South Korea, Japan and china.

The worldwide mobile data traffic will be eightfold in 2023 to 110 Exabyte per month. This corresponds to a HD-video stream which runs for 5.5 million years. The mobile data traffic grows strongly in North America. At the end of 2017 enormous quantity of 7 Byte per month is to be produced per connection in section. The west Europeans come with 4, 1 Byte per month in the second place in worldwide ranking of Smartphone –data utilization.

(Photographs are in back inside cover)

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