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NOKIA

		Efficiency
		System
	✕	
	✓	Industry, enterprise, public services
		Application challenge
		Requires conducive standardisation and a fair and balanced patent licensing system, additional radio spectrum needs
	✓	Strong, with external partners
	✓	Enabler for follow-on innovation, general purpose and across sectors
	✓	Worldwide, with emerging demand
	✓	Subject to above challenges being addressed

Teaming-up drones

Drones have been around for a long time – probably longer than you think. They were first developed in 1917, but it was almost a century later, in 2013, that they entered the mass market with the development of consumer drone technology. Today they are cheaper and more accessible than ever.

As the availability of drones has increased, so has the range of their applications. Drones already help us monitor traffic, inspect crops and look out for potential wildfires in dry parts of the world, among many other uses.

But even this level of utility only scratches the surface. As the era of Industry 4.0 unfolds, the potential roles and requirements for drones will grow too. Not only in terms of the capabilities of individual drones, but, more significantly, in terms of the capabilities of fleets of drones acting in unison. These fleets will be controlled centrally, and while each drone will have a specific job, they will not need individual piloting.

Getting drones to network

This future is close. Nokia has developed a solution allowing customers to see the power of a fleet of drones connected over a public or private 4G/5G network. It comprises drones, docking stations and a ground control station, which enable remote drone operation beyond a visual line of sight. The solution allows multiple drones to fly on automated missions steered from a single ground control station, running on an edge cloud.

Individual drones within a fleet can be customised to meet particular needs. For example, in rescue missions, some drones can carry cameras equipped with thermal imaging. Others might be equipped with loudspeakers, searchlights or customisable sensors for smoke, motion or radiation. Nokia's dedicated payload development kit and open APIs approach ease customisation and system integration for a wide range of use cases, such as for mining, energy generation and transmission, manufacturing, transport and disaster relief.

Nokia's drone solution was recently selected by a Belgian service provider for the world's first nationwide drone network. The solution includes 70 'Drone-in-a-Box' units, connected through 4G and 5G, and will support emergency services across Belgium. Equipped with video and thermal cameras, the drones are on 24/7 stand-by and remotely managed from five operations centres. The drones will be used to provide real-time aerial situational awareness, especially in the critical first minutes of an emergency.

A huge jigsaw

Getting a drone network fully operational was like completing a huge jigsaw. We had to develop many missing pieces, sometimes leveraging general purpose 4G and 5G technologies and roadmaps, sometimes creating new ones. Another critical driver of success was collaboration which brought together wide-ranging software and cross-technology domain expertise. And importantly,

we are relying on a series of patented inventions related to 4G and 5G, all of which are standardised. Moreover, we also filed specific patents related to the drone solution.

In sum, without the participation of a range of innovative actors across various industries, including but not limited to telecoms, the creation of this world first nationwide drone network would have been impossible.

Future-proofing Europe's basis for innovation

Europe is facing huge competitiveness challenges *vis-à-vis* global peers and rightly wants to come out on top. To achieve this, Europe must lead in digital innovation – and to lead in digital innovation, top-quality, high-performing connectivity is essential.

The drone network development illustrates how leadership in wireless connectivity technology and standardisation are key factors that underpin potential digital innovation potential. Capitalising on our deep knowledge in advanced wireless technologies and associated patents was essential in developing an innovative drone solution.

European leadership in digital innovation is only possible if we secure and further develop our existing technological strengths.

Specifically, three things need to happen:

First, Europe needs to remain a global leader in the development of telecom technologies (like cellular technologies such as 5G advanced and 6G), and the 'go to' place to create and improve global standards for such technologies. And yet, the European Commission proposes

a massive regulatory intervention with respect to standard-essential patents: a radical change to the licensing paradigm that originally led to European leadership in 5G. This may sound like a legalistic change, but if passed, it would have profound consequences: Europe's tech leadership would be undermined and standards development would be driven away from the EU to other jurisdictions that are treating standardisation as a policy priority. Damage to Europe's innovation capability can only be averted by revisiting the Commission proposal.

Second, we must avoid a bottleneck in future connectivity, which would stifle digital innovation in Europe. New digital use cases and services drive increasing data traffic and capacity needs. Member States should commit to allocating further spectrum for

5G Advanced and 6G. This will be essential to provide adequate connectivity in both densely and sparsely populated areas in a cost-efficient manner.

Third, public authorities should become early adopters of new solutions. This will stimulate further investments in technology solutions made in Europe and help European innovators to grow their respective business and effectively expand onto global markets.

Europe needs to act now. Critical regulation and policy proposals for standard essential patents and spectrum are on the table. Only if we take the right decisions now, will we ensure that European digital innovation, vital for the digital transformation of so many sectors, can thrive.