



Future roadmap – 5G

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2016 What happens in an INTERNET MINUTE?



2017 This Is What Happens In An Internet Minute



Moving into new business models in Internet age, everything need to be connected



From bookstore to e-book



From record store to streaming



From Yellow Pages to marketplace



From taxi to ride-sharing



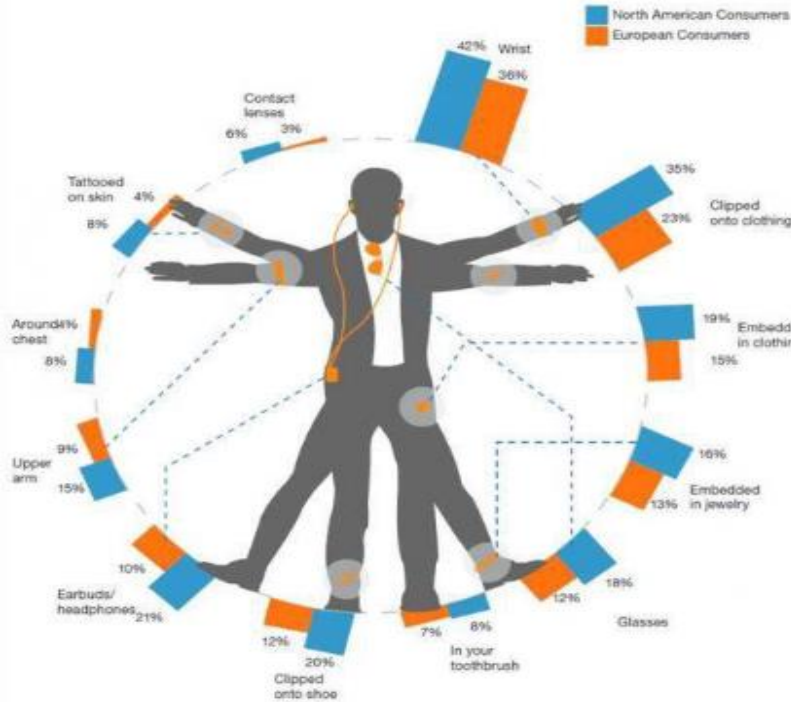
We thought 2G – 3G migration will help!
We thought 3G – 4G migration will help!
We now think 5G could help??



By 2020, 57,000 NEW things will be added to the NET every second!

Sensors everywhere, providing real time communications

"How would you be interested in wearing/using a sensor device, assuming it was from a brand you trust, offering a service that interests you?"



Digital assistants



Siri



Connected cars

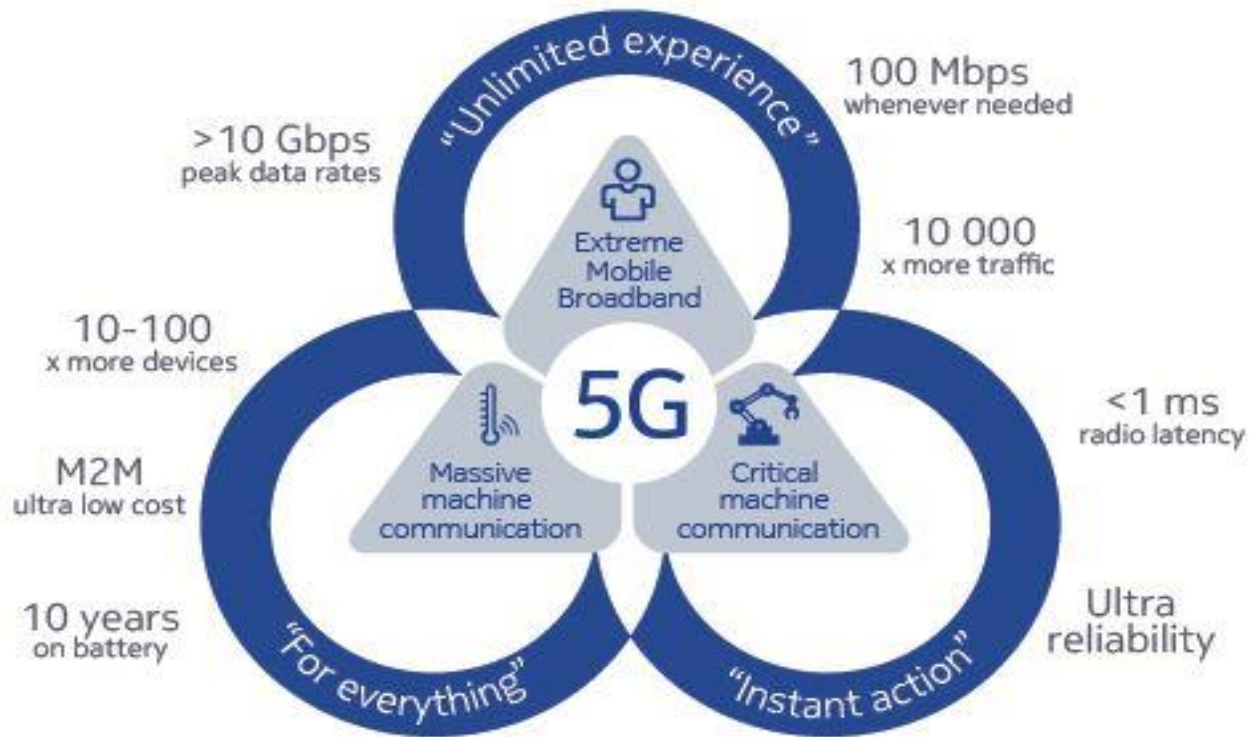


Waymo LLC



Need significant capacity, enormous amount of simultaneous connections and lowest latency possibly which 3G/4G technologies cannot sustain

What does 5G promise



Diverse spectrum possibilities on 5G



Low bands below 1 GHz: longer range for e.g. mobile broadband and massive IoT
e.g. 600 MHz, 700 MHz, 850/900 MHz

Mid bands 1 GHz to 6 GHz: wider bandwidths for e.g. eMBB and mission-critical
e.g. 3.4-3.8 GHz, 3.8-4.2 GHz, 4.4-4.9 GHz

High bands above 24 GHz (mmWave): extreme bandwidths
e.g. 24.25-27.5 GHz, 27.5-29.5, 37-40, 64-71 GHz

Licensed Spectrum

Exclusive use

Shared Spectrum

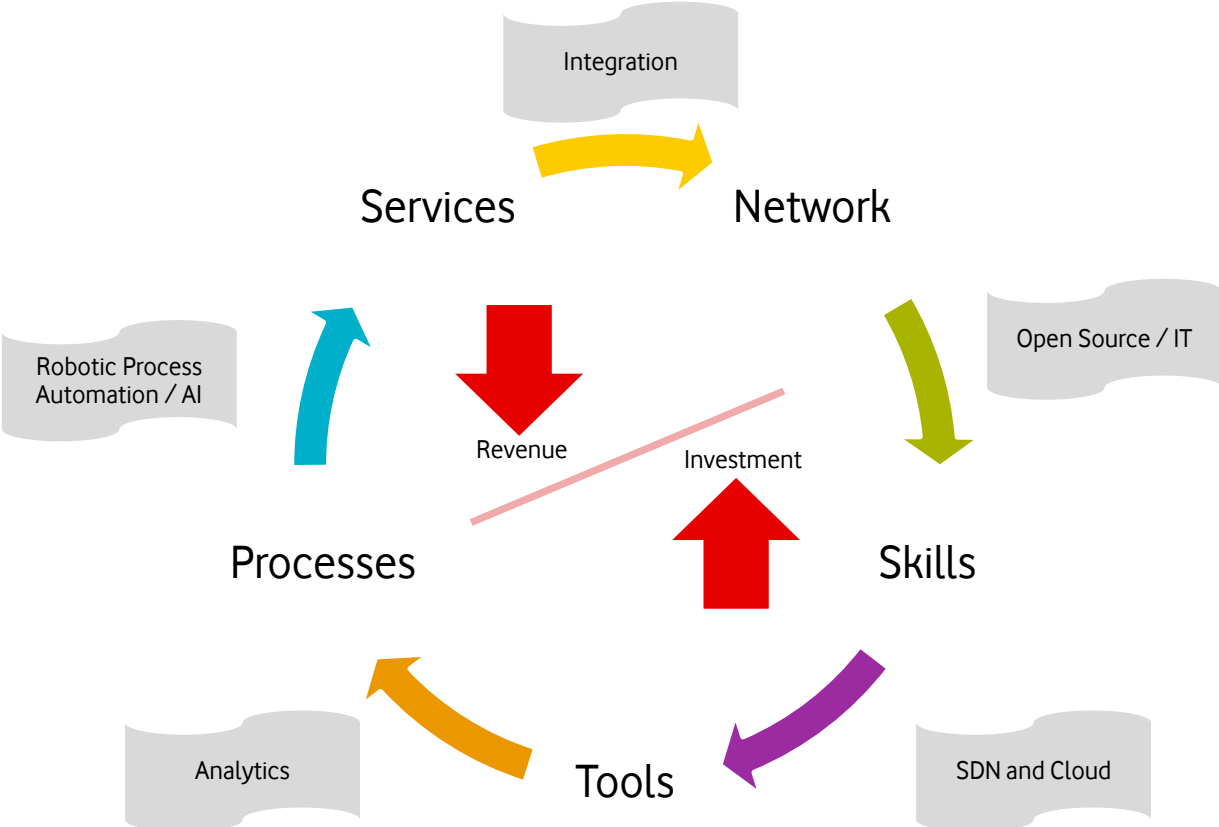
New shared spectrum paradigms

Unlicensed Spectrum

Shared use



Massive challenges await everyone



Balancing investments vs returns – a big challenge



Thanks !

