Arthur D Little

5G als Treiber der digitalen Transformation im Gesundheitswesen

Keynote – Health.DigitalCity.Wien FORESIGHT #10

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Here with you today….

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Focus on 5G and digital transformation in the healthcare industry, with 7+ years of consulting experience

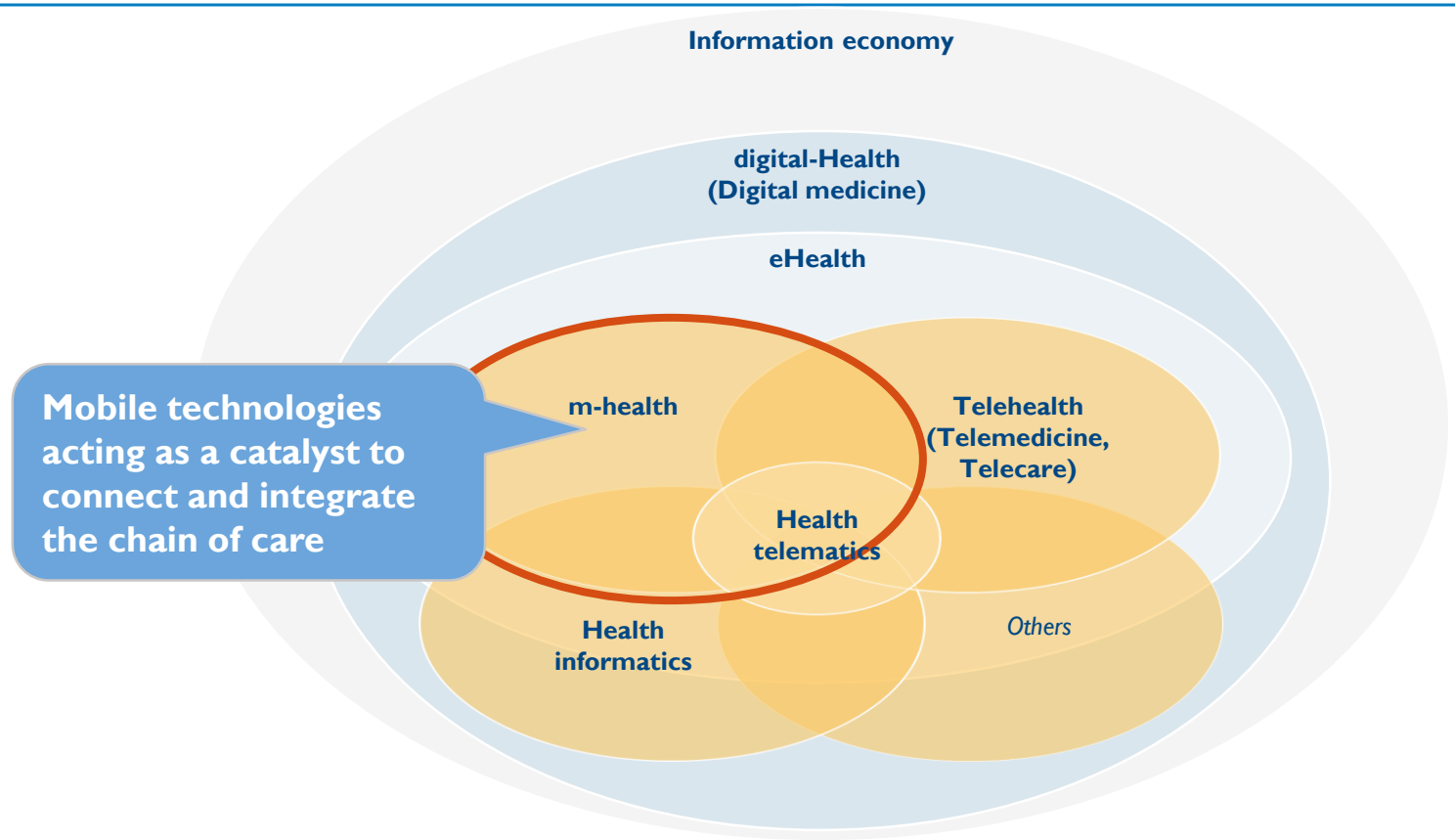
The paradigm shift in the healthcare industry drives the uptake of new technologies

Old world		New world
Treatment of patients	**Paradigm shift**	***Health of citizens***
Provider centric		*Patient centric*
Episodic approach, curative		*Lifetime care, preventive*
Hospital based		*Decentralized, community based*
…		…

Source: Arthur D. Little

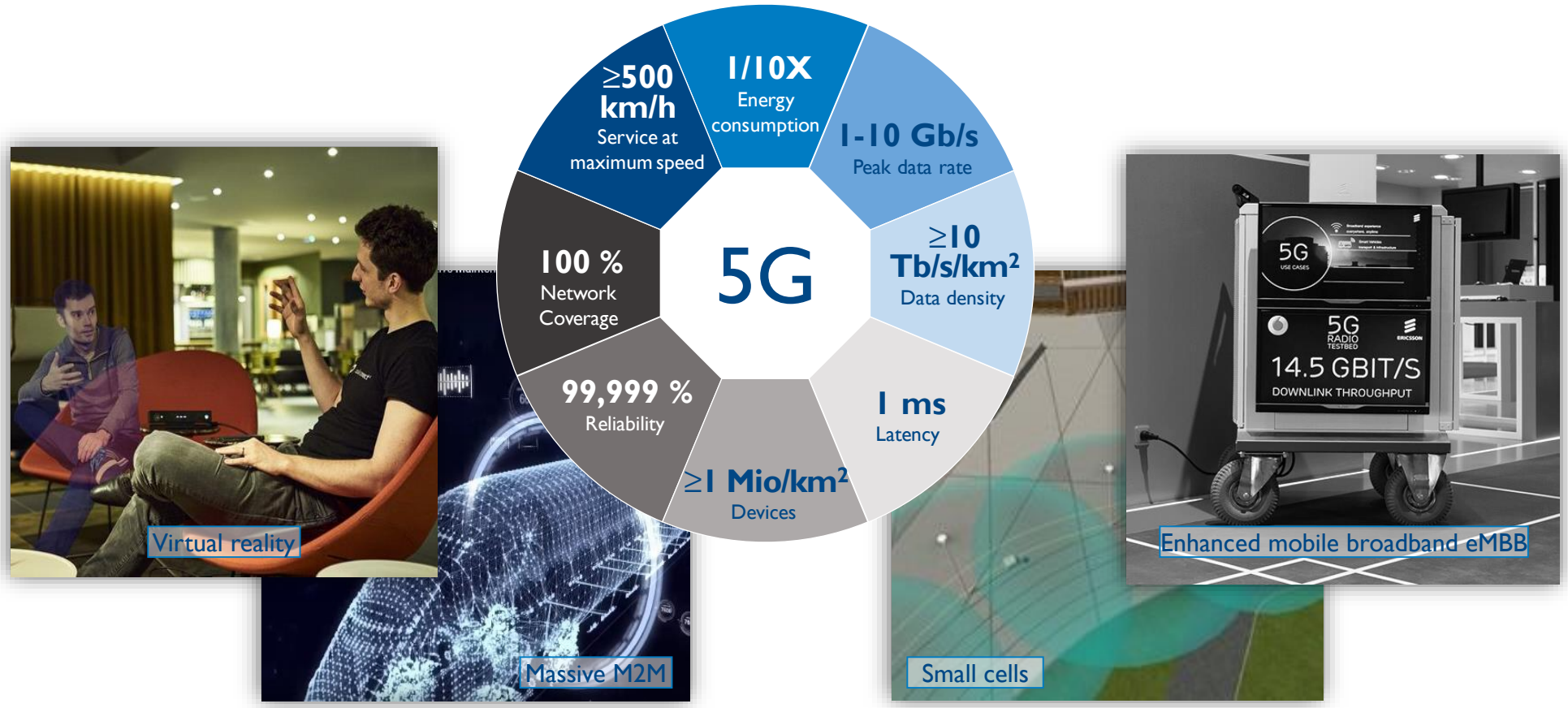
Digital-Health combines a variety of concepts and mobile technologies thereby acts as the catalyst to connect and integrate the chain of care

Digital-Health and the relation between key concepts



Source: Mitchell, J. & Associates (1999) The cost effectiveness of telemedicine enhanced by embracing e-health; m-healthTalk.com (2013) m-health — What does it mean and what's included; digital-Health Group (2013) digital-Health, University of California; Sonnier (2012) Definition of digital-Health; Arthur D. Little

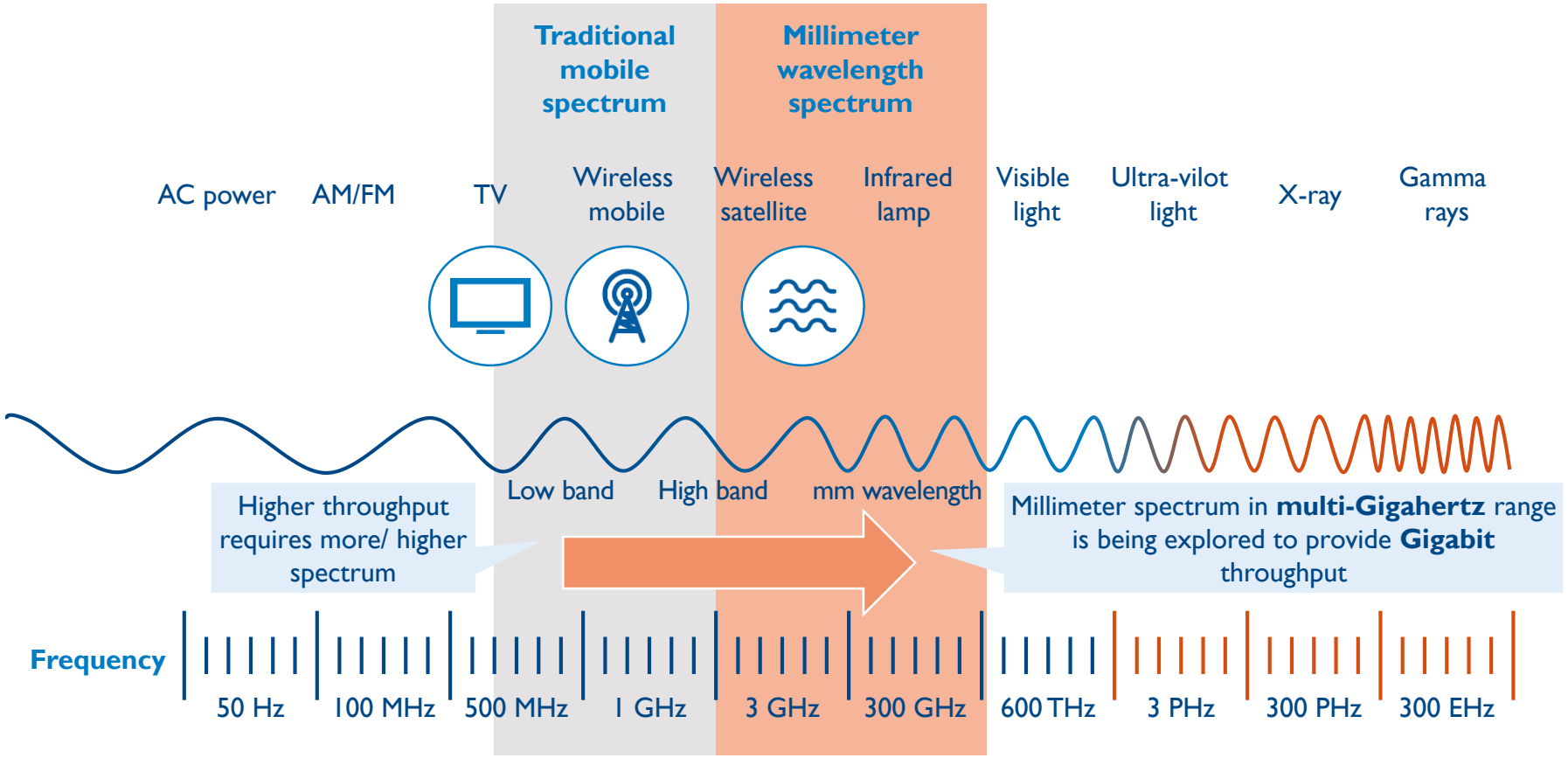
What does 5G bring to the world…



Source: Arthur D. Little, European Commission

5G can be realized across different spectrum bands…

5G technology overview



Source: Arthur D. Little Note: Size of band is not drawn to scale

To enable digitalization in the healthcare environment, we see three main building blocks – focus today on MPN & slice solutions

Overview solution space

0

In-building connectivity

Target: Coverage, efficiency

Campus Networks

1

Mobile Private Networks

5G

Target: Use-case enablement **on-site**

2

Network Slicing

5G

Target: Use-case enablement **off-site**

Focus

Source: Arthur D. Little

Strategic value creation in the healthcare industry through mobile private networks and network slices

Agenda

1

Mobile Private Networks

5G

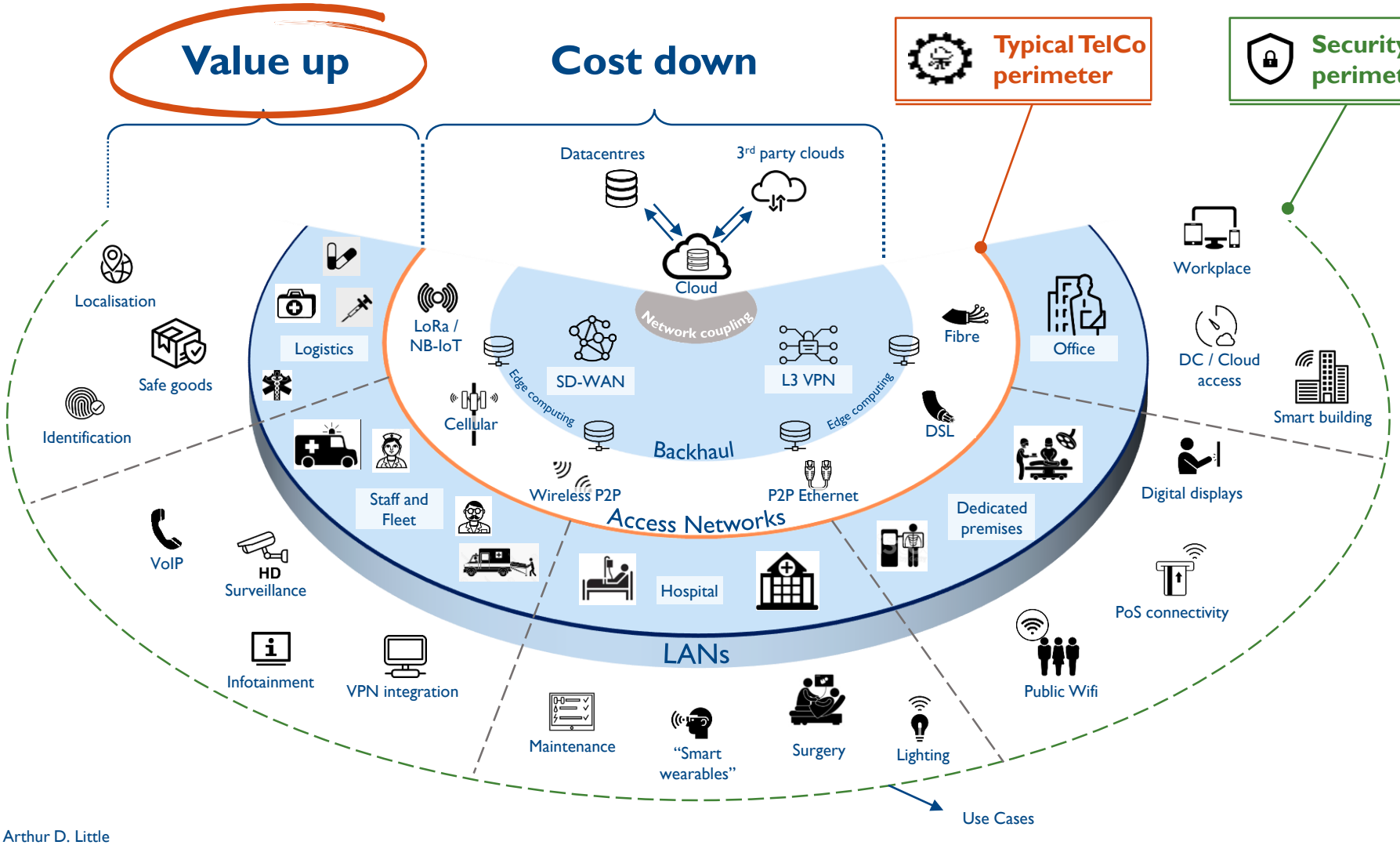
2

Network Slicing

5G

Source: Arthur D. Little

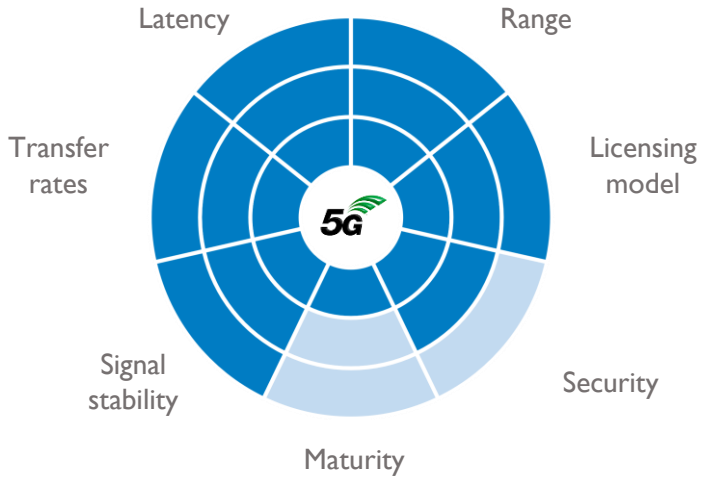
What is a mobile private network (MPN)?



Source: Arthur D. Little

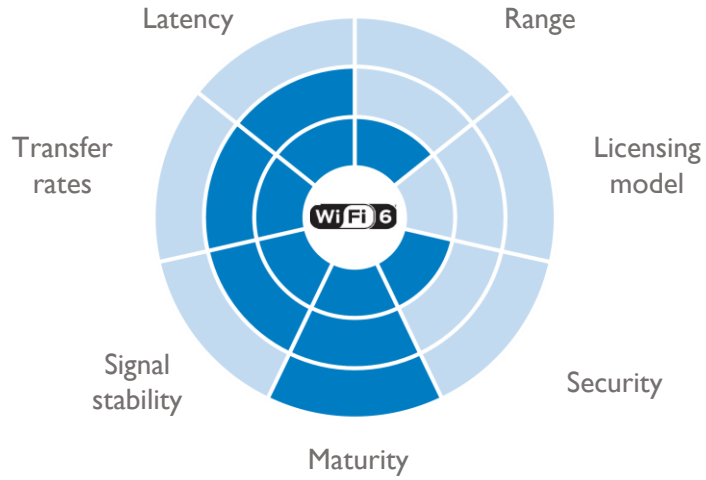
What are the advantages over WiFi?

5G



- Clear upside in terms of **latency**, **transfer rates**, **range** and **security**
- **Market maturity** at the moment is **not fully achieved**

WiFi (6)



- **Freely available frequency** with no limitation of usage and **market maturity**
- Feasible only as a local solution due to **low range** and **limited security**

Source: Arthur D. Little

A wide range of use-cases is already implemented in leading medical facilities around the globe

MPN use-cases

1 *Connected devices*

- Cellular networks provide an **in-built prioritization** of **traffic flows,** vs. access technologies such as WiFi, enabling **time-critical communications** to perform as needed

2 *Video collaboration*

- XR tech enables hospitals to view real-time 3D images for key applications such as; **trainings, surgical activities** and **other life-saving procedures**

3 *Video surveillance*

- Video surveillance and thermal cameras are both becoming **less reliant on cabled power** sources and **more cost-effective**

4 *Patient / asset tracking*

- Hospitals maintain a variety of **valuable tools and equipment** with monetary and health value **critical to day-today operations -** Keeping track of medical assets **in real-time increase efficiencies**

Source: Athonet, Arthur D. Little

Case-study: Yonsei together with SK Telecom are building a state of the art hospital using the latest technologies enabled by a 5G MPNs

Yonsei and SK Telecom

- **What**: Specialized network
- **When**: early 2020 onwards
- **Where**: Yongin Hospital, South Korea
- **Who**: SK Telecom, Yonsei University

- Yonsei University Health System will open its newest hospital in Yongin in early 2020 with the latest technologies supported by a 5G network provided by SK Telecom
- Aims to improve patient comfort, convenience for medical staff and strengthen information and physical security through 5G, introducing:
  - **Holograms of loved ones** for very sick patients in isolation
  - **AR-based indoor navigation**
  - **Facial recognition** for authorized medical workers to enter secure areas
  - Patient room functions **voice controlled** (i.e. bed, lights, TV, nurse, etc.)
  - Automated **electronic medical records** updates from IoT monitoring devices

Source: SKTelecom, IEEE Spectrum Arthur D. Little

Strategic value creation in the healthcare industry through mobile private networks and network slices

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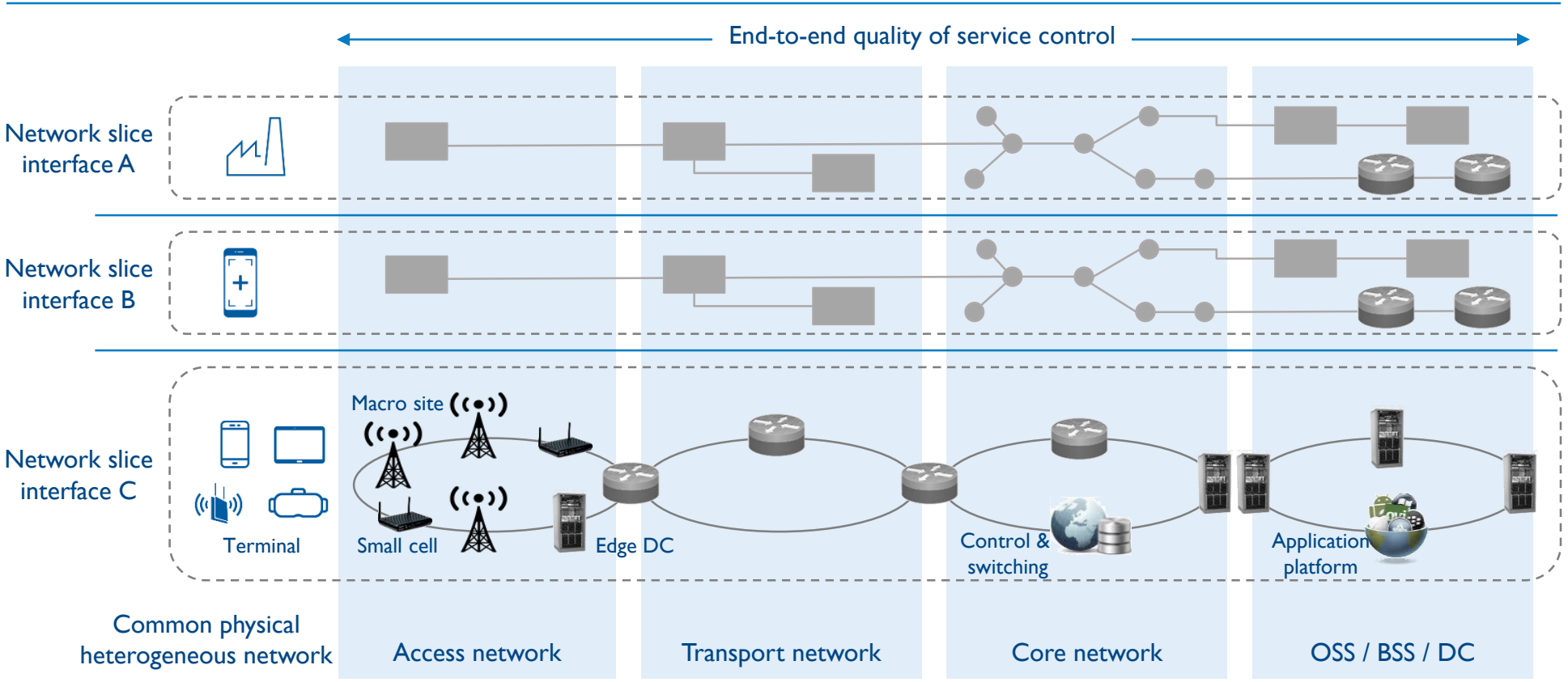
5G

Source: Arthur D. Little

What is a mobile network slice?

5G network slicing



Source: Arthur D. Little, Whitepaper – 5G Service Guaranteed with Network Slicing by China Mobile, Huawei, Deutsche Telekom, Volkswagen Feb 2017

New healthcare use-cases are emerging in the 5G network slicing domain – most applications only in PoC status though

5G slicing use-cases in the healthcare industry

Remote patient monitoring

Remote patient vital-sign monitoring in hospitals for e.g., long.-term patients. Healthcare work can monitor sleep monitoring, UV exposure, etc. and have instant access to the information.

Telemedicine

Caring for patients remotely by e.g., dialing in through videos, using 360 degrees cameras etc. to diagnose and provide treatment.

Connected ambulance

Allows doctors to perform a surgery remotely by gaining secure and reliably access to a robot and controlling it

Medical Drone Transportation

Drones can be used to transport vital medical assets including organs for transplant, medical equipment and drugs both more quickly and more cheaply than by courier.

Remote robotic surgery

Allows for more effective communication between the first responders and the emergency department team at destined hospital

Source: Arthur D. Little

Case-study: The 5G Ambulance remotely connects specialized medical professional to situations where there needed in times of emergencies

Vodafone

5G Barcelona

- **What**: 5G-connected ambulance
- **Where**: Barcelona, Spain
- **When**: Summer 2020
- **Who**:5G Barcelona

- The ambulance is equipped with **communication and technology services** using the 5G network such as; **sending and receiving HD** real-time video for **immediate care of patients'** well-being, while in route
- The ambulance can **connect to the hospital, other vehicles (V2V)** and other emergency units.
- Healthcare providers and ambulance teams **maintain secured voice or video contact** with other emergency technicians for **immediate patient care**, especially **in times when specialization is needed**, such as birthing or stroke cases
- 5G allows **slicing and efficient operation of dedicated mobile network** in order to guarantee communication and service capacity, regardless of others on the network
- The ambulance **becomes a base station in the network,** extending the network, with **mass connectivity for IoT devices** such as monitors, sensors, etc.

Source: 5G Barcelona, Arthur D. Little


thank you!

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations.

Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. Arthur D. Little is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations.

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