# 5G_eHealthSax Platform in Leipzig, Germany

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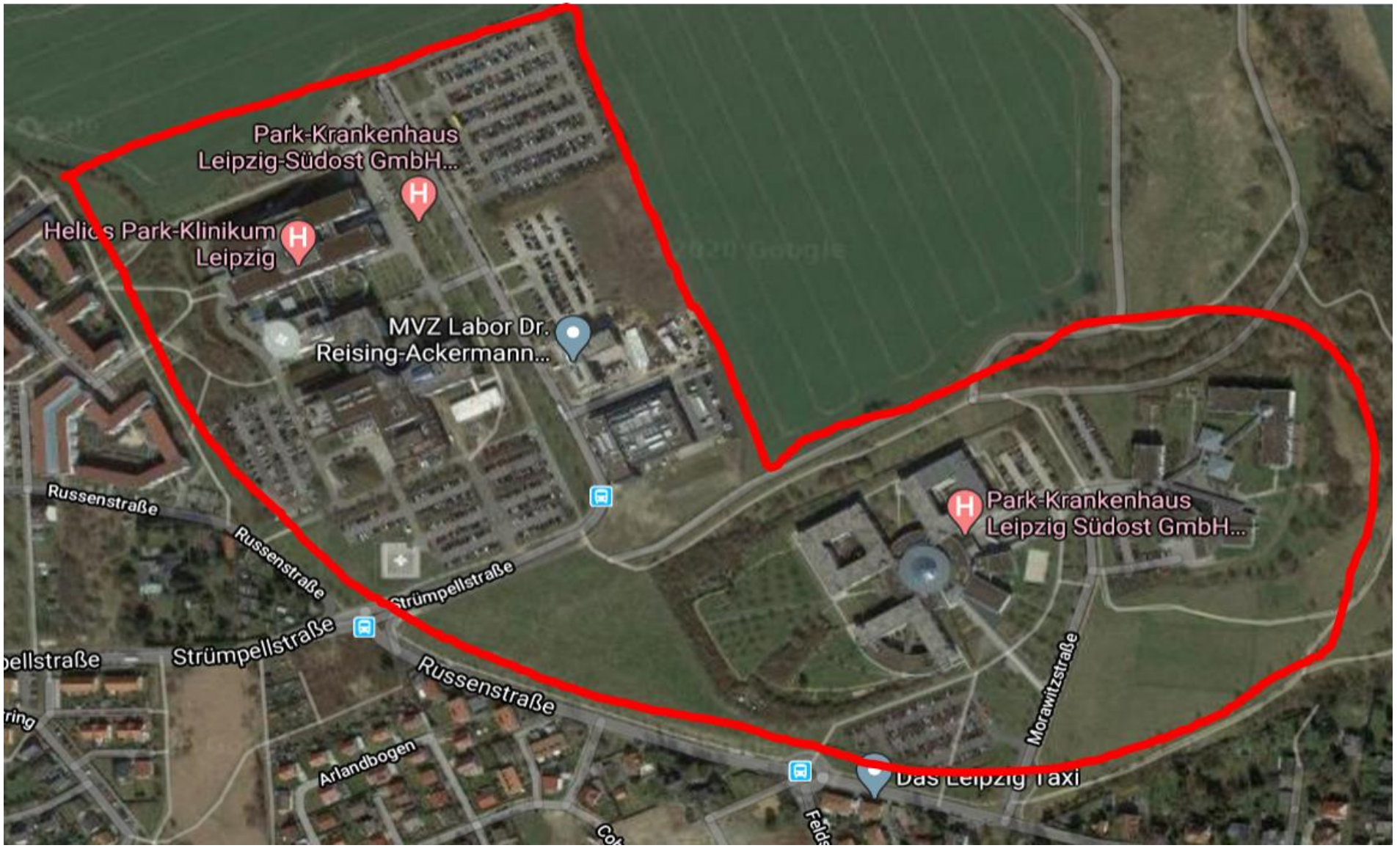
# Disclaimer

- I am presenting in a scientific capacity. The slides represent my own views only and are not necessarily identical with those of my employer.

# 5G_eHealthSax Implementation 2021: Helios Campus Leipzig: 800 - 900 beds including Leipzig Heart Centre and Centre for Mental Health

# Helios Campus Leipzig -> 800 - 900 beds



# Here we go again: “Why 5G?”

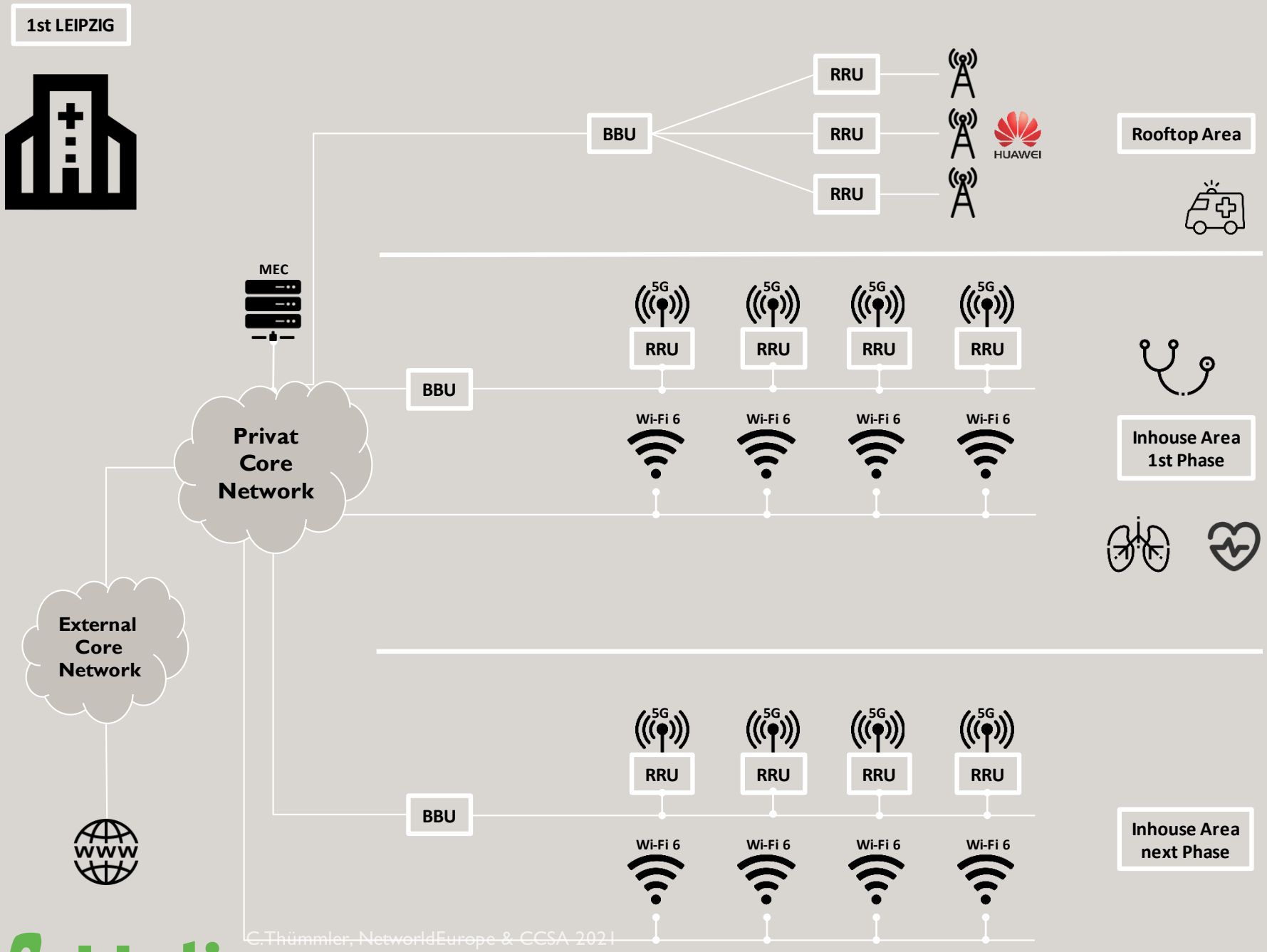
- 5G = (5G + 4G + 2G) !
- Privacy / Security
- Resilience
- Roaming (Device Monitoring)
- Network Slicing (Business model!)

# 5G-eHealthsax* (Start 01.01.2020, Project-End 31.12.2021)

Aims and objectives:

1.) Build a Test-Bed for XG Health-Technology in Leipzig
2.) Implement an Indoor and Outdoor XG Campus Network using 3,7 - 3,8 GHz
3.) Validate the Test-Bed with relevant Use Cases
4.) Expand the Testbed, unfold economic activity, offer impartial information to the public and help to enhance and facilitate economic activities

*This project is co-funded with taxpayer's money by the State of Saxony




- Rooftop antennas enabling testing of entrance scenarios (emergency arrival)
- Inhouse coverage enabling simulation and testing of health and care scenarios
- Expansion of test and trial areas to test robustness and reliability of 5G and Wi-Fi access as well as accuracy of tracking
- Continuity and connectivity testing in elevators and other areas with demanding coverage deployment
- Core Network Deployment for Test and Development in supplier premises
- Trial and Life Core Network to be deployed in HELIOS premises
- Vertical slicing / separation of Life and Trial network
- Test and Development strictly separated and isolated
- Non-important traffic off-loaded to Wi-Fi (TV, browsing)

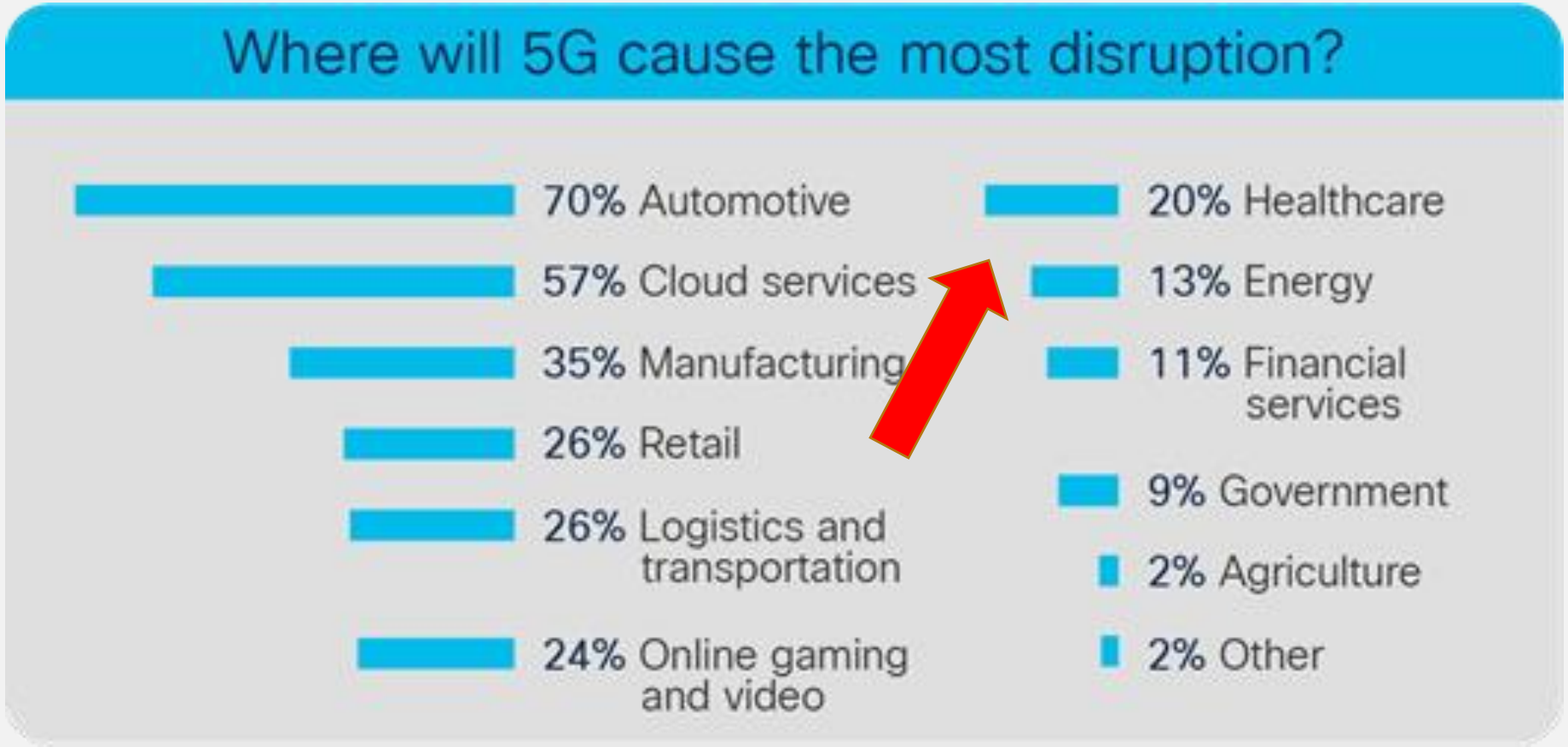

Infusion-pumps

Smart-Pharma

Tracing and Tracking / Geo-fencing

Cardiac Monitoring – Roaming


# DELPHI STUDY:20% BELIEVE 5G WILL DISRUPT HEALTH VERTICAL!

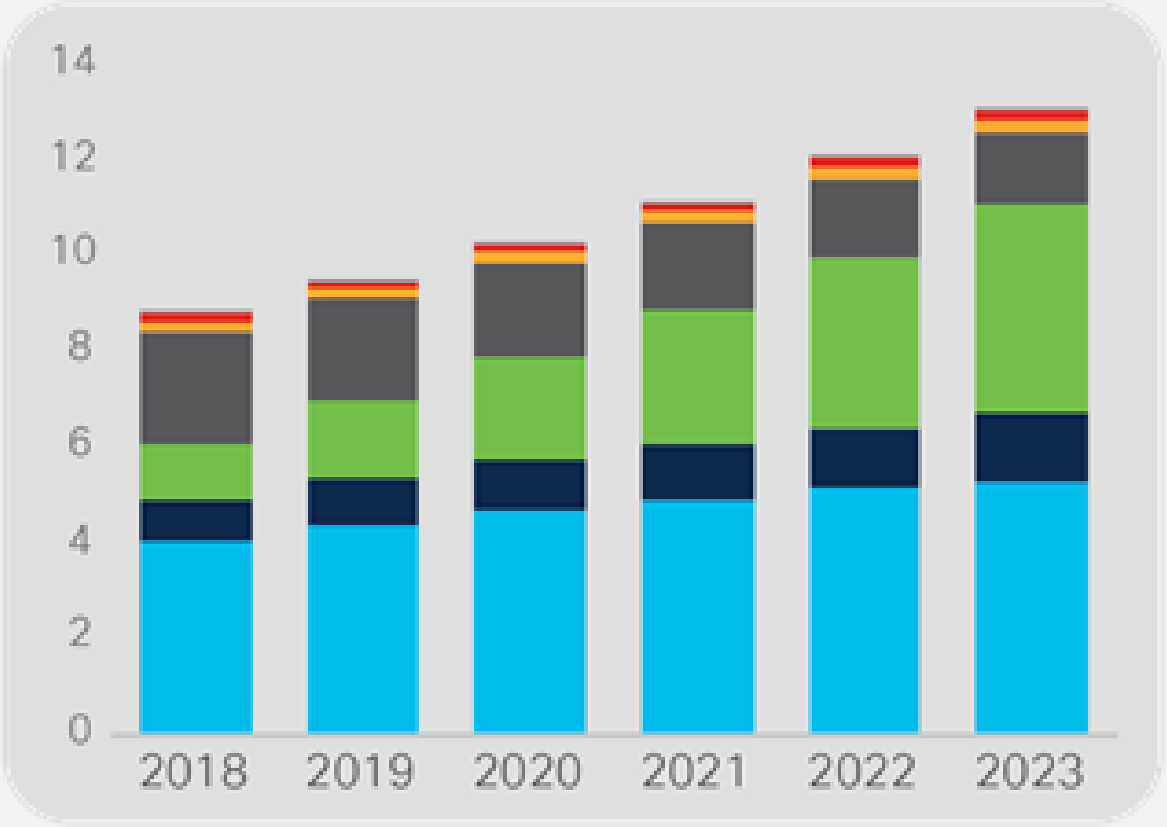



**Source: Business Performance Innovation (BPI) Network Survey, BNI, 2019**
**[Percent of respondents: N = 145 global IT leaders and service providers] Respondents selected top three industries.**

# CONNECTED DEVICES

8% CAGR
2018-2023

Billions of Devices



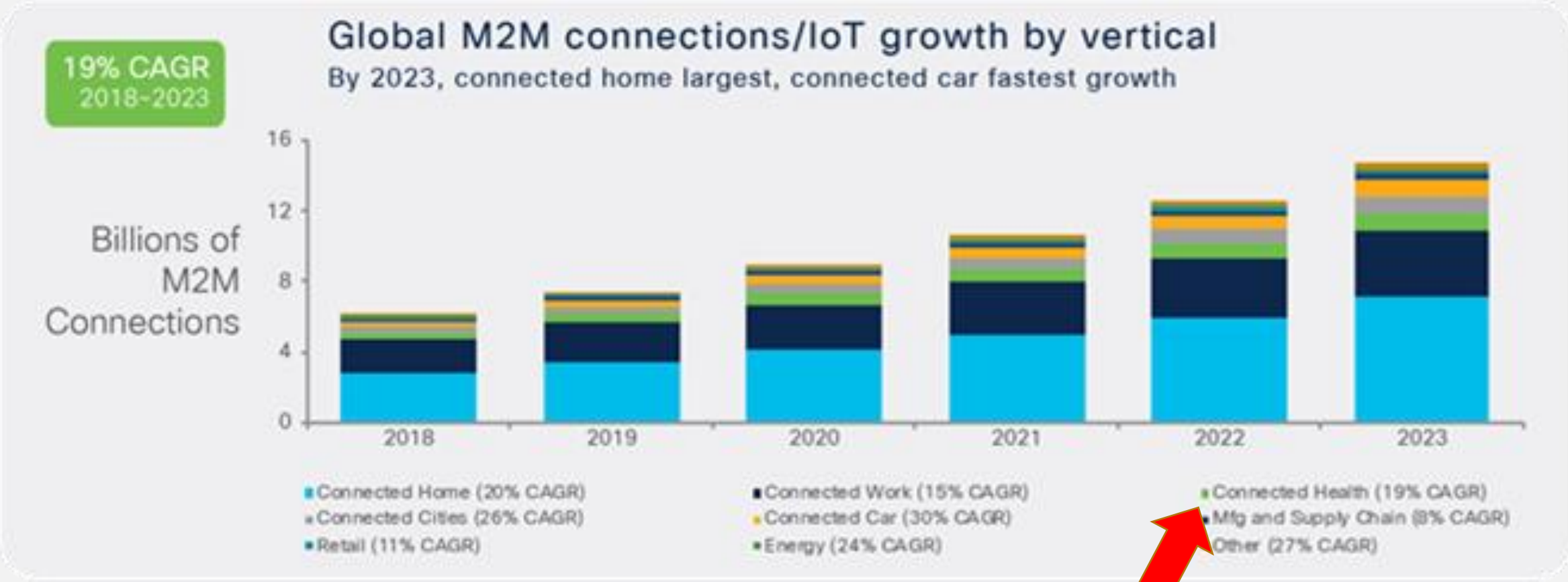

- Smartphones (46%, 41%)
- Phablets (9%, 11%)
- M2M (13%, 34%)
- Nonsmartphones (27%, 11%)
- Tablets (2%, 2%)
- PCs (2%, 2%)
- Other Portable Devices (0.1%, 0.1%)

* Smartphone category including phablets

* Figures (n) refer to 2018, 2023 device share

Cisco Annual Internet Report 2018 – 2023

# HEALTH M2M SECOND LARGEST GROWTH!

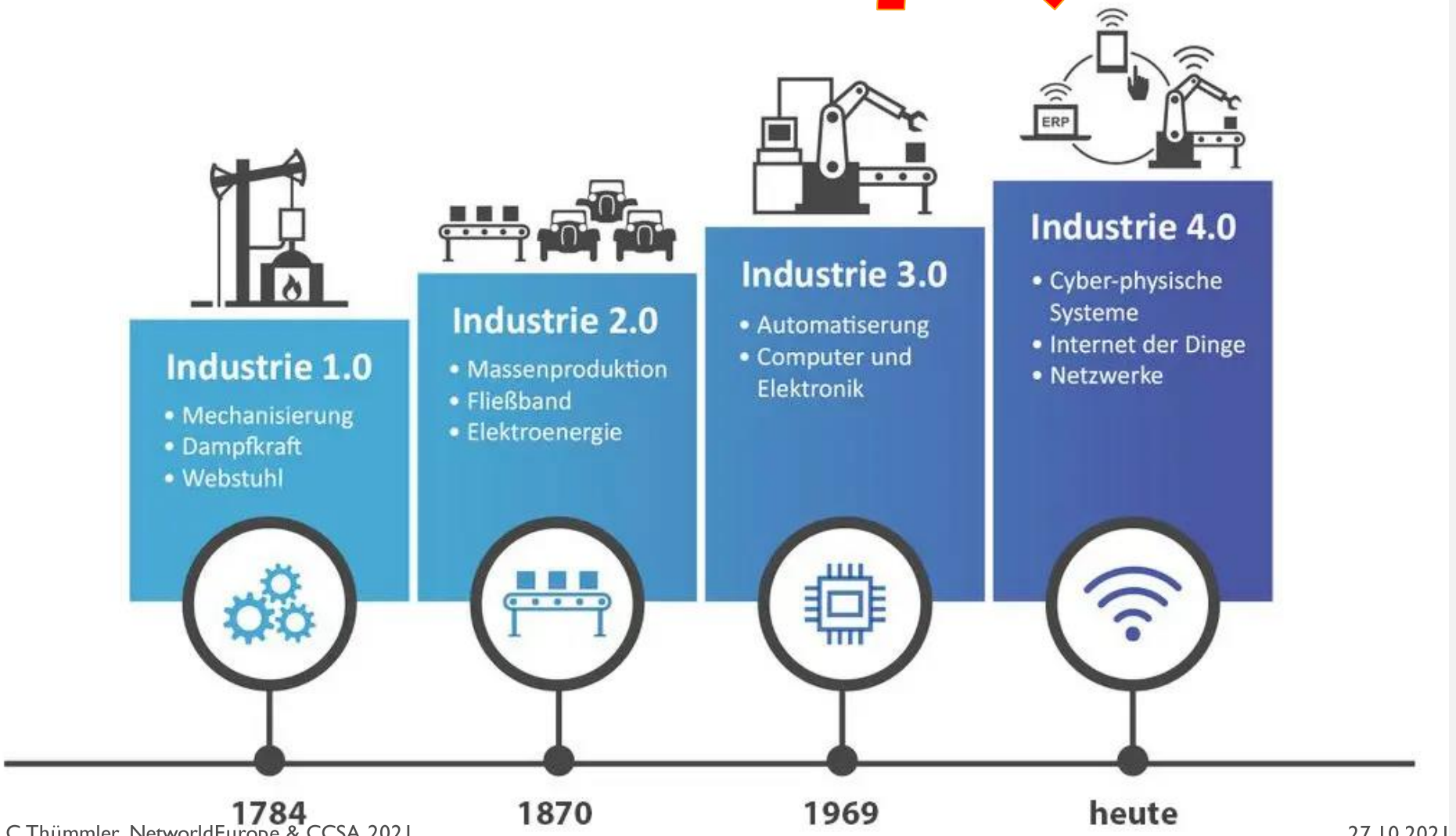



* Cisco Annual Internet Report 2018– 2023

# POTENTIAL 6G TOPICS

- Shortrange Communication (D2D)
- Utilization of new frequency bands (110 -170 GHz, Terahertz, Nanohertz)
- Enhanced download **and upload rate**
- New network topologies to accommodate smart pharmaceuticals, precision medicine and massive IoT
- Holographie,
- Enhanced Augmented Reality
- Multi-sensory Communication
- Body-area Networks
- Pervasive AI

# FOKUS: KATALYSE DES ÜBERGANGS VON INDUSTRIE 3.0 NACH INDUSTRIE 4.0



# 5G_EHEALTHSAX EXPERIENCES SO FAR

- Compatibility and interoperability is still a major problem when constructing private 5G networks but if you look for suitable devices you will find them
- Most mobile phones do not operate in stand alone networks in Germany. (The matter has been addressed with the federal regulator agency (BNetzA))
- Private 5G networks are ideal starting points for health organizations. National / international roaming needs to be addressed
- The next logical step is the introduction of network slices in cooperation with device manufacturers (Cyber-physical systems, transition from hardware to service providers)
- Medical devices with 5G / XG capability will arrive in around 2-3 years from now and will enhance governance and financial benefits to health care providers
- With regards to 6G early global standardization in the medical domain is key to address the challenges of healthcare through demographic changes worldwide

# Thank You!