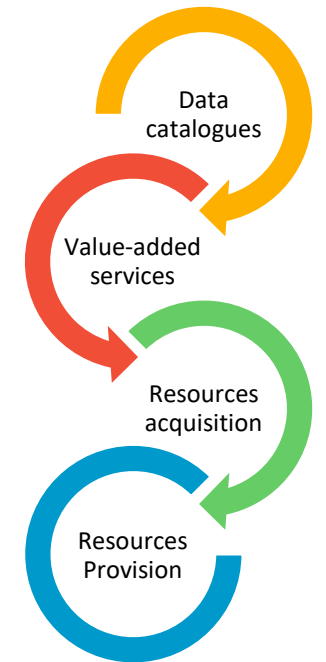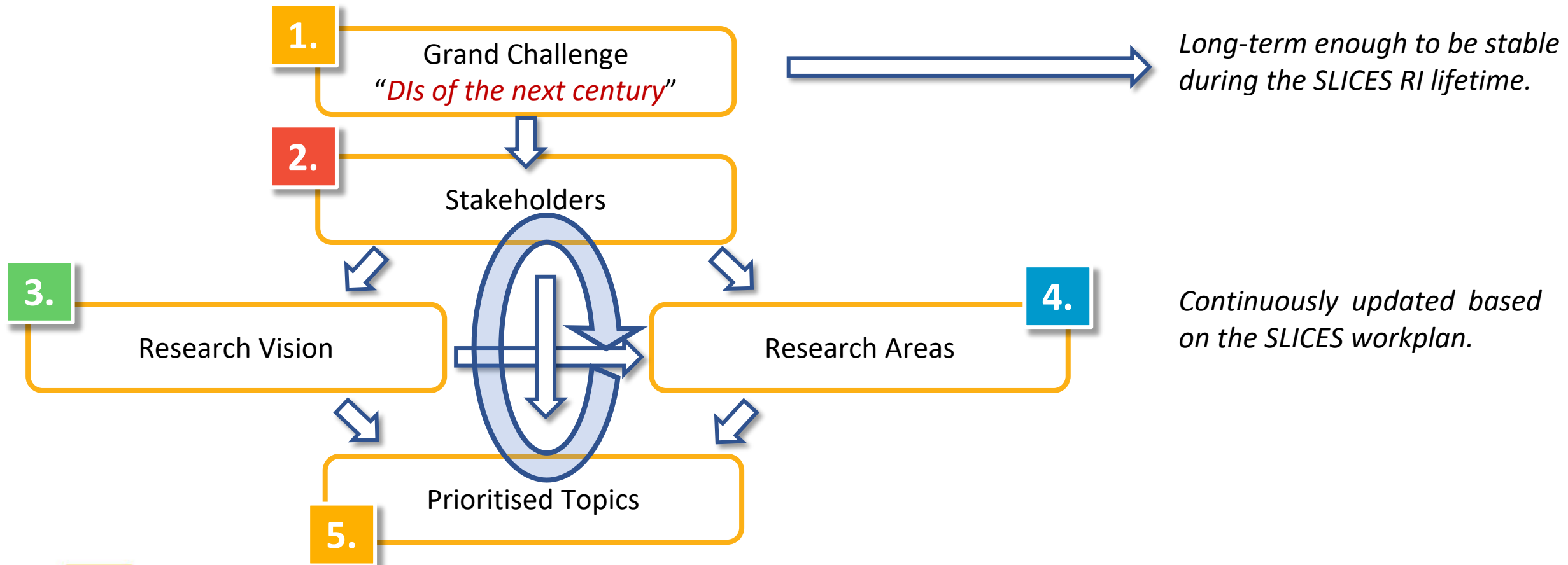# SLICES in a nutshell

- ***Digital transformation*** is at the heart of our society!

- There is ***no*** digital transformation ***without digital infrastructures.***

- Launched in 2017, **SLICES** is an **RI** to support the **academic and industrial research community** that will design, develop and deploy the **Next Generation** of **Digital Infrastructures:**

  - SLICES-RI is a **distributed RI** providing several **specialized instruments** on challenging research areas of Digital Infrastructures, by **aggregating** networking, computing and storage **resources** across countries, nodes and sites.

  - ***Scientific domains***: networking protocols, radio technologies, services, data collection, parallel and distributed computing and in particular cloud and edge-based computing architectures and services.

    www.slices-ri.eu

what we offer

Data catalogues

Value-added services

Resources acquisition

Resources Provision

slicesRI

Fully Controllable, programmable Virtualized Digital Infrastructure Test Platforms

USA NSF PAWR (Platforms for Advanced Wireless Research): NSF + Industry, 100M€, 2017-2022

NSF Fabric: NSF, 20 M€, 2019-2023

Colosseum: NSF-DARPA, 20+7,5M$, 2017-2025.

China CENI
Chinese Experimental National Infrastructure
2018-20223
190 M€

SLICES methodology for scientific dimension

1. Grand Challenge "*DIs of the next century*"

Long-term enough to be stable during the SLICES RI lifetime.

2. Stakeholders

3. Research Vision

4. Research Areas

Continuously updated based on the SLICES workplan.

5. Prioritised Topics

SLICES research vision – key elements

3.

Definition of a research vision on future DIs

Massive diffusion of IoT devices/Cyber Physical Systems at the edge.
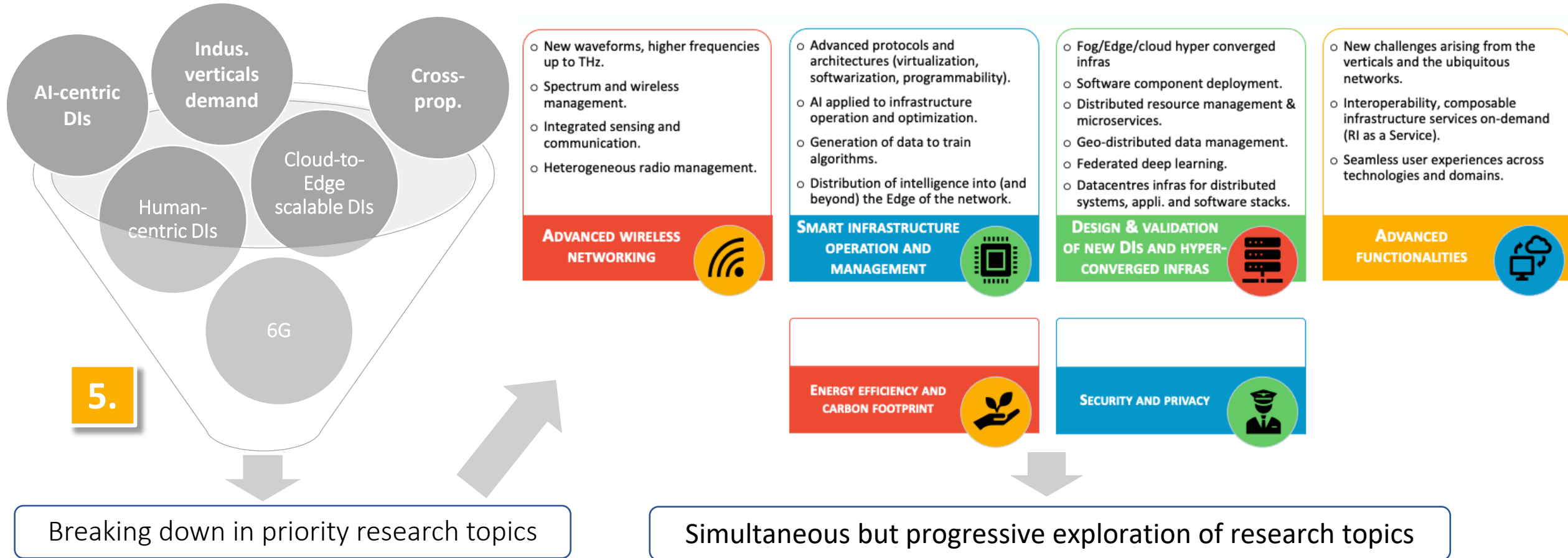
Large amounts of data generated in real time.

Pervasive connectivity across wireless, mobile and fixed.

Need for decentralised complexity towards the edge.

DIs not mere "dumb pipes" to move data to centralised Cloud/HPC infrastructures…

but decentralised, interconnected infrastructures characterised by distributed intelligence and highly efficient communications.

Prioritisation of research topics – pervasiveness of Cloud/Edge/IoT

AI-centric DIs

Indus. verticals demand

Cross-prop.

Human-centric DIs

Cloud-to-Edge scalable DIs

6G

5.

o New waveforms, higher frequencies up to THz.
o Spectrum and wireless management.
o Integrated sensing and communication.
o Heterogeneous radio management.

ADVANCED WIRELESS NETWORKING

o Advanced protocols and architectures (virtualization, softwarization, programmability).
o AI applied to infrastructure operation and optimization.
o Generation of data to train algorithms.
o Distribution of intelligence into (and beyond) the Edge of the network.

SMART INFRASTRUCTURE OPERATION AND MANAGEMENT

o Fog/Edge/cloud hyper converged infras
o Software component deployment.
o Distributed resource management & microservices.
o Geo-distributed data management.
o Federated deep learning.
o Datacentres infras for distributed systems, appli. and software stacks.

DESIGN & VALIDATION OF NEW DIs AND HYPER-CONVERGED INFRAS

o New challenges arising from the verticals and the ubiquitous networks.
o Interoperability, composable infrastructure services on-demand (RI as a Service).
o Seamless user experiences across technologies and domains.

ADVANCED FUNCTIONALITIES

ENERGY EFFICIENCY AND CARBON FOOTPRINT

SECURITY AND PRIVACY

Breaking down in priority research topics

Simultaneous but progressive exploration of research topics

slices**RI**

Speakers (12' each) & Agenda

- Konstantinos Filis, COSMOTE, Greece
  - LeonR&Do testbed: A scalable IoT platform for facility automation and energy control
- Bartosz Belter, PSNC, Poland
  - SLICES-PL: research infrastructure for science and industry
- Cédric Crettaz, Mandat International, Switzerland
  - What to test for IoT?
- Raymond Knopp, EURECOM, France
  - Some IIoT Use-Cases and associated challenges @ SOPHIA-NODE
- Thanasis Korakis, U. of Thessaly, Greece
  - SLICES-GR - NITOS: An integrated facility for beyond 5G research
- Enrico Buracchini, TIM, Italy
  - An operator view on 6G perspectives, and the role of European projects' experimental platforms
- Open Floor

IOTWeek

Dublin ——— June 20-23, 2022

Thank you!

Find more:

Slices-ri.eu

iotweek.org