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NEXTWORKS
ENGINEERING FORWARD

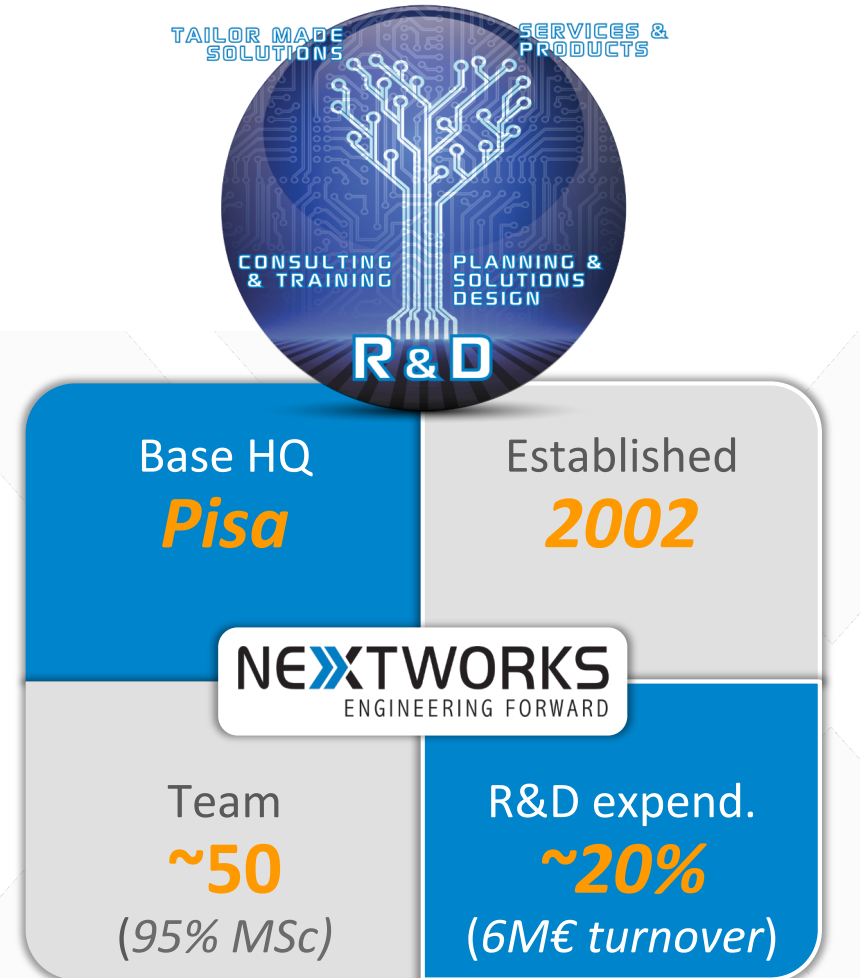
5G for I4.0 from an SME viewpoint *research experience and perspectives*

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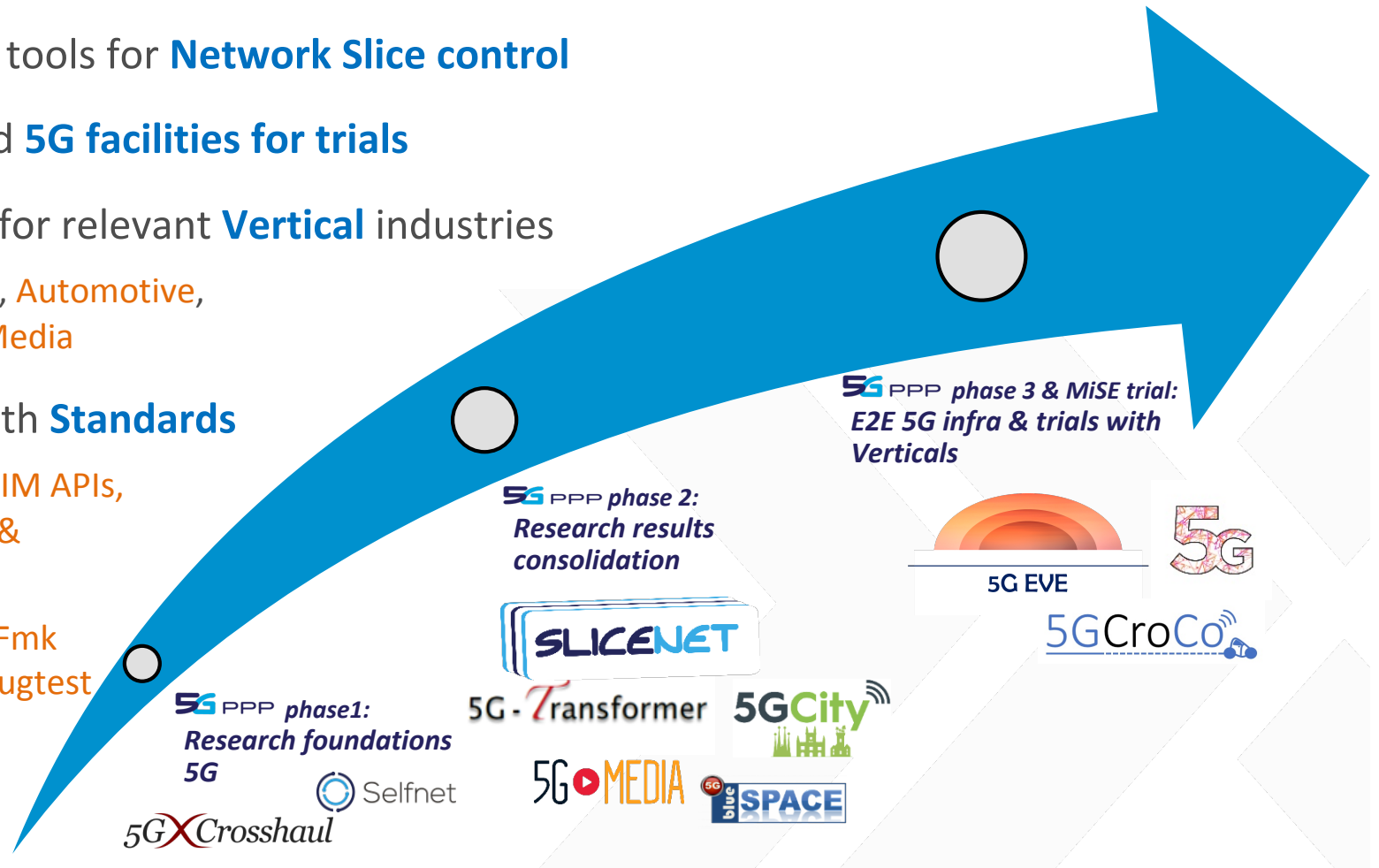
SESSION
Industry 4.0: Investments and Future Jobs

- **Core research (strategy towards 2022)**
 - **5G Networks:** architectures, technologies and ctrl tools
 - **Internet-of-Things** and **M2M** technologies and architectures for **Smart Building, Smart Factory, Smart City**
 - **SDN/NFV for datacenters** (edge/core) and Cloud
 - **RINA:** network architectures beyond TCP/IP
- **Virtuous cycle:**
 - **know-how generation** → **knowledge services & products**
- **Collaborative R&D** with top-international consortiums
 - **20** projects in H2020 (**9** in 5G PPP phase 1/2/3)



Multi-year research program on 5G Control & Orchestration

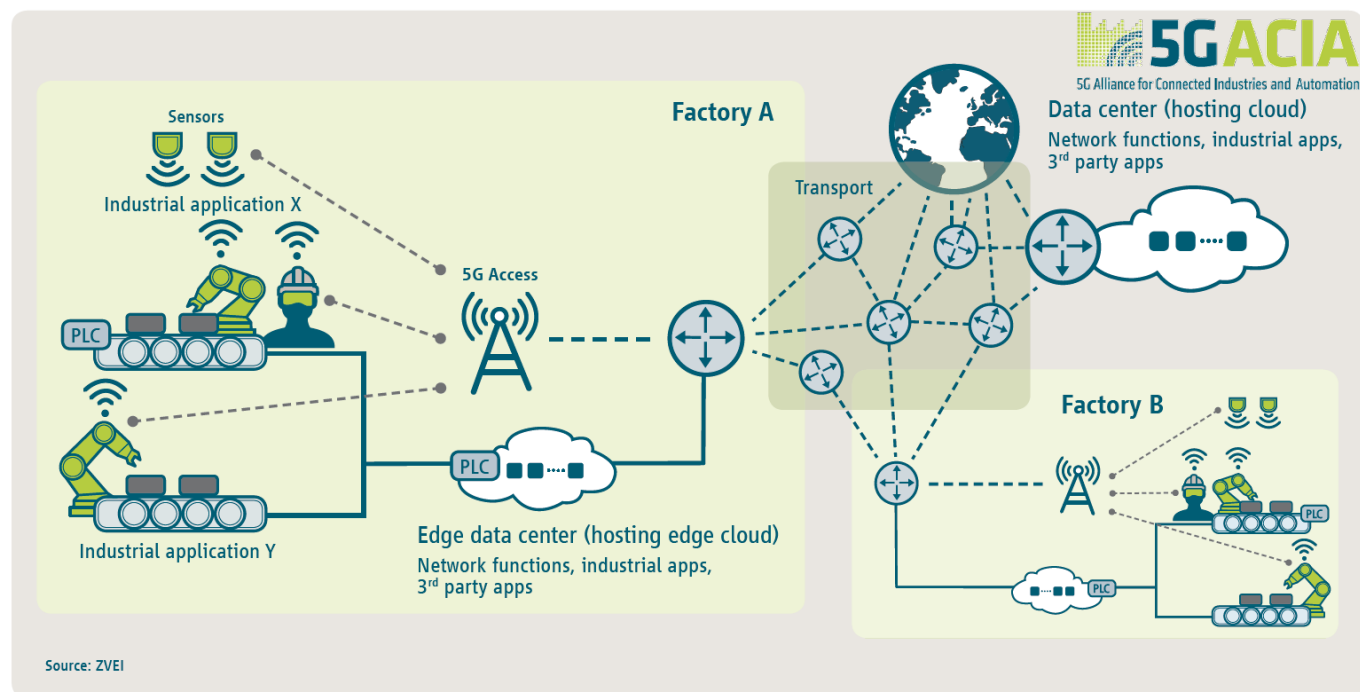
- Design & develop tools for **Network Slice control**
- Design end-to-end **5G facilities for trials**
- Measure **5G KPIs** for relevant **Vertical** industries
 - Energy & Utilities, Automotive, Manufacturing, Media
- Align and work with **Standards**
 - Leader STF NFV VIM APIs, NFV Testing Fmk & NFV OpenAPI
 - STF MEC Testing Fmk 2nd/3rd/4th NFV Plugtest
- Member of the **Board of 5G IA**



The 5G-enabled smart factory problem [from 5GACIA]

- Relevant use cases [for Nextworks]: *Video-operated remote control, Process automation, Process monitoring*
- Key Challenges
 - Network Slicing
 - Distribution of workloads from core to edge
 - Throughput
 - Latency & Reliability
 - Security

*Some target KPIs in
3GPP TR 22.804*



SMEs can orientate and master various SDN/NFV/MEC/Cloud technologies to build (or help to build) innovative services and new products



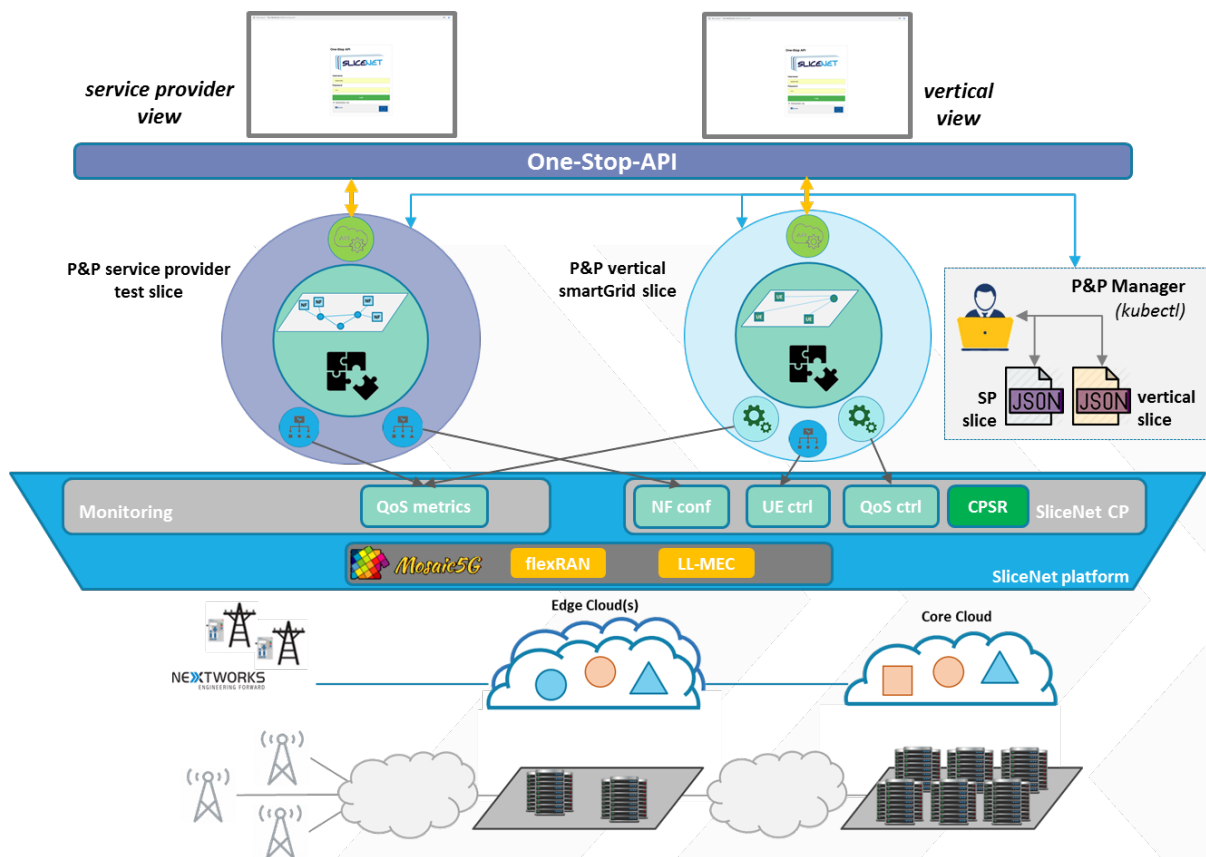
- Vertical-tailored customized **control exposure and slice view**

- IEDs/UEs information retrieval
- Access to QoS statistics and slice performance

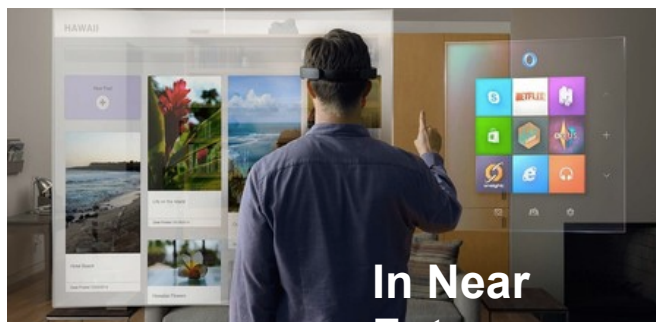
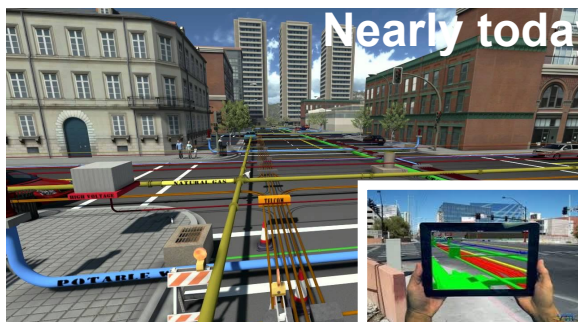
- Microservices** and cloud native approach

- Slice flexibility** by design

- Slice expansion with new IEDs/UEs
- Slice optimization triggered by vertical QoE feedback



- Future communications with 5G capable to offer *truly immersive user experiences*, across the various scenarios of **Smart Industry**, **smart living**, etc.



- The “**Intuitive Connected Factory/Building**”
 - **5G, SDN/NFV, MEC, IoT** as core technologies
 - From **imperative behaviors** (*cognitive approach*) to actuation based on **emerging behaviors** (*intuition*)
 - Intuitive E2E orchestration (Edge-to-edge or edge-to-cloud) for intuitive sensing/actuation on devices
 - **Programmable analytics** to implement decisions based on multiple sources of information (network, application, devices/user tracking, etc.)
 - **More intelligence at the edge** (e.g. serverless/ Function as a Service)



Leader **STF**
OpenStack/VIM APIs
&NFV testing Fmk &
NFV OpenAPI

Tech team **2nd/3rd/4th**
NFV Plugtest, STF
MEC testing Fmk

Participant in
NFV, MEC, ZSM,
NGP ISGs,OSM OSG



Member of the **Board**
of 5G Infrastructure
Association



Vice-chair of the
Steering Board



9 H2020 5GPPP
projects
(phase 1/2/3)



3 H2020 projects
on IoT, FoF



Member of **AIOTI** **8 H2020 projects**
on SDN/NFV



Thank You

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WEB: <https://slicenet.eu>

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