EU-IoT Trustworthiness and Security Aspects for Sustainable IoT end-to-end systems

Dr. Rute C. Sofia, fortiss GmbH (sofia@fortiss.org)
IIoT competence field head

IoT Week – 23.06.2022
Identity, trust and privacy in an intelligent, smart IoT World. Challenges and outcomes Workshop

EU-IoT: The European IoT HUb - Growing a sustainable and comprehensive ecosystem for Next Generation Internet of Things, 10.2020-05.2023,
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CSA EU-IoT: Positioning, Facilitating Engagement

https://www.ngiot.eu/eu-iot/

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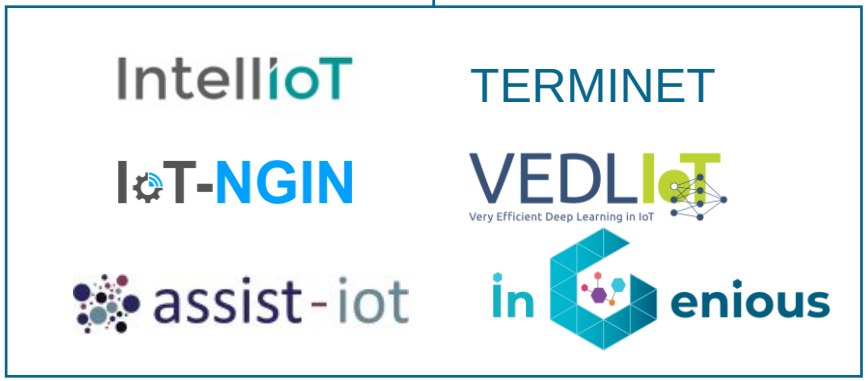
Digital Transformation Platforms

Policy engagement

EU Alliance for Ind. Data, Cloud, Edge



Next-gen Technology

ENGAGEMENT AREAS / ACTIVITIES

EU-IOT GUIDE
"Strategy across NGIoT ecosystem"

- CB and joined meetings (AB, EG, EC)
- Whitepapers and strategic reports
- Pool of strategic resources

EU-IOT CATALYST
"Community building and innovation strategies"

- Stadardisaton, pre-standardisation and open sources initiaties & activities
- Survey & interviews
- EU-IoT Hackathon(s) – tools and activities
- EU-IoT Forum organisation

EU-IOT COACH
"Positioning and strengthening IoT as a driver"

- Use Cases and Business Models
- Skills Survey & Interviews
- Training content
- Success stories / best practice

EU-IOT AMPLIFIER
"Outreach and impact creation"

- Impact assessment
- Communication Task Force

RIAs – direct involvement
CSAs – promotion to the engaged projects / ecosystem

STRATEGIC OVERSIGHT EU-IoT

BRAIN-IoT · SOFIE · SERIOT · SEMIOTICS · IOTCRAWLER · CHARIOT · WSO2 · usignite · H-CLOUD · ARTEMIS Industry Association · AI · ITU · ETSI · IEEE Advancing Technology for Humanity · FLAGSHIP · OPENDEI · EFFRA · NGIoT · BDV Big Data Value Association · 5G IA · GAIA-X · AIOTI Alliance for Internet of Things Innovation · IOT NEXT CLUB · IntellIoT · IoT-NGIN · assist-iot · TERMINET · VEDLIoT · inenious

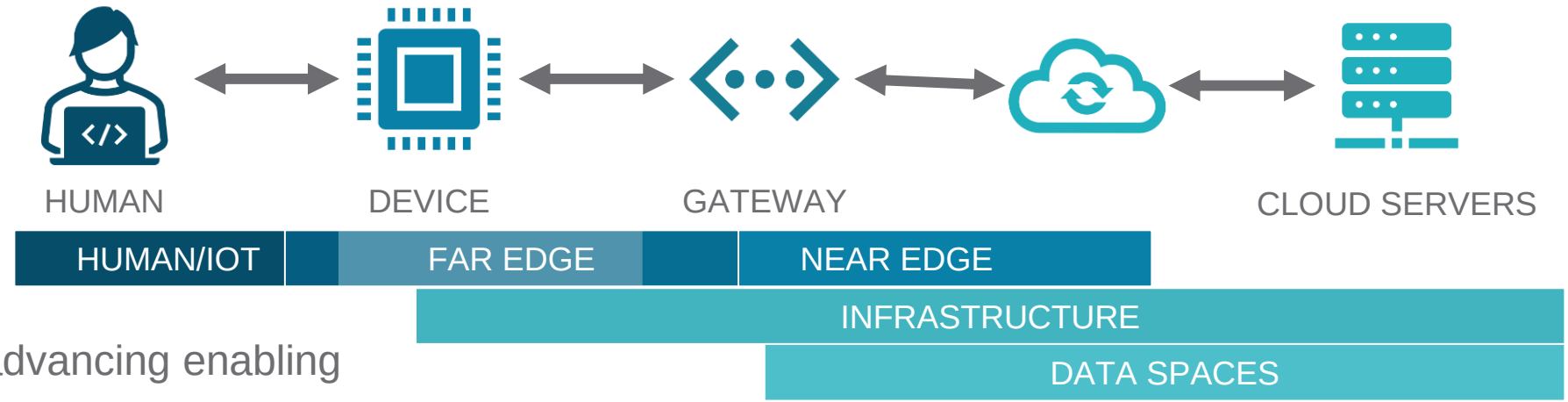
INDIRECT

PARTICIPATORY

COLLABORATIVE

DIRECT

A GLOBAL OVERVIEW



- **Technology**: Novel and advancing enabling technologies.
- **Market:** Applications, services, and models enabled by the technologies (both individual and varied combinations).
- **Standards and policies**: Common approaches, standards, and policies.
- **Skills**: The current and future demands resulting from all the above.

echnological Scope Analysis and Recommendations

EU-IoT Deliverable D3.7: Research recommendations towards standardisation v1.0, Sep 2021

	HUMAN/IOT	FAR EDGE	NEAR EDGE
SCOPE	Tactile Interfaces Distributed AI	Open hardware Brownfield integration Neuromorphic Computing Intelligent offloading	MEC Federated learning Hardware and ML
Recommendations SDOs	•IEEE P1918 “Tactile Internet Working Group” •ITU-T, Tactile Internet, •ETSI ISG IP6, participation in work items. •AIOTI WG on Standardisation, specifically focusing on ontologies and semantic technologies.	• IEEE, federated learning application standards. • BDVA, regarding consultation, position papers. • IETF, *Reliable Available Wireless (RAW)* working group about deterministic use-cases and requirements, mobile far Edge environments and TSN integration into wireless. • IETF IoT operations Working Group, as for, for instance, brownfield device integration, large-scale onboarding, trustworthiness, etc.	•ETSI MEC

EU-IoT: ICT-56 2021 RIA Analysis

SCOPE

INFRASTRUCTURE	DATA SPACES
5G core integration	**AI-based knowledge representation**
SDN, NVF **Satellites and 5G**	**Edge semantic orchestration**
Satellites as a Service	**Multi-agent WoT systems**
Federated AI	
Wireless TSN	

Recommendations SDOs

- IETF COIN (Computing in the Network Research), about service and network decentralisation aspects, SDN, ICN.
- IRTF Network Management WG, 5G and Edge integration

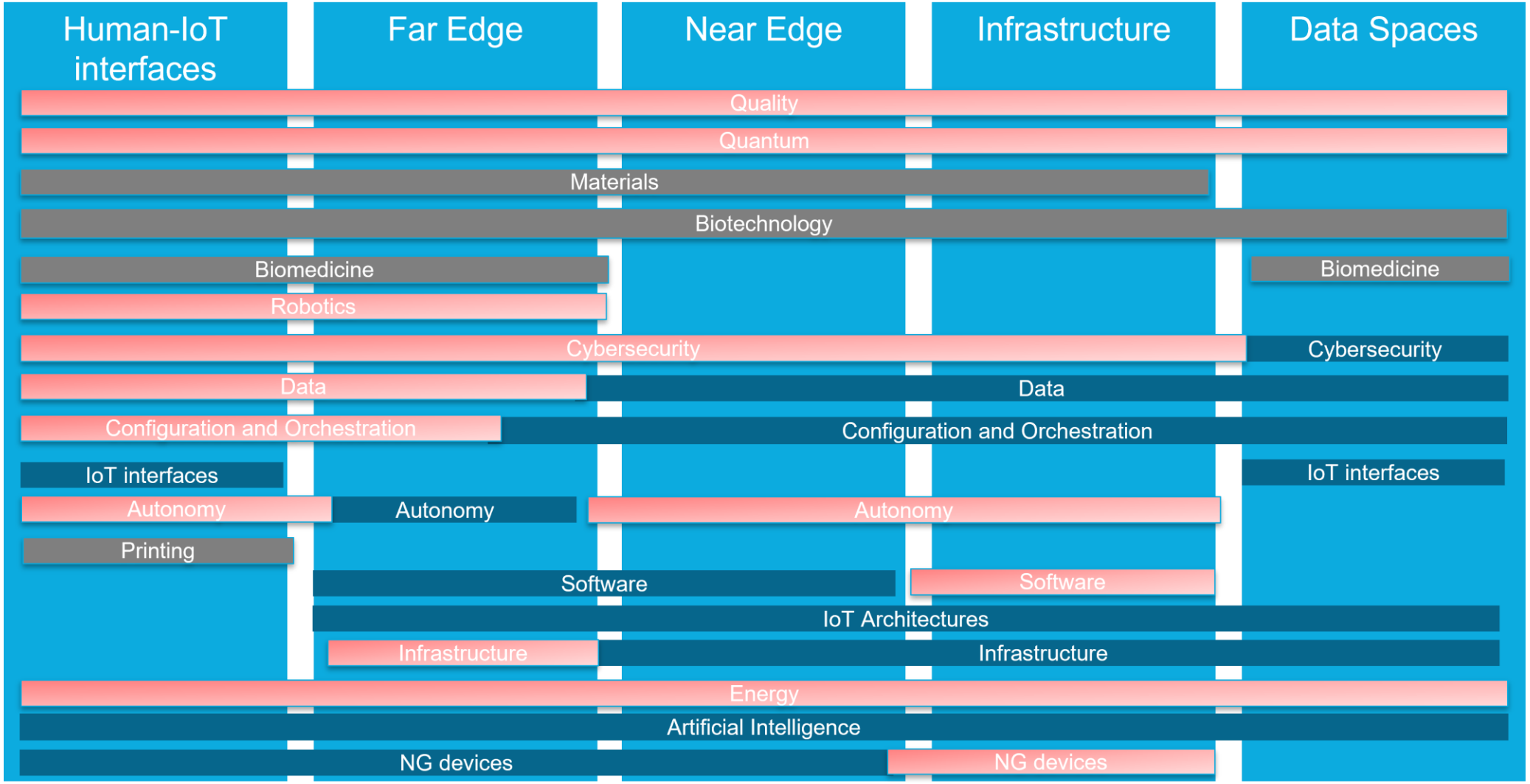
•GAIA-X, architectural design, data interoperability
•BDVA/DAIRO and AIOTI joint initiative for DATA Spaces: trustworthiness, privacy use-cases; interoperability

•*Trust and Trustworthiness*. Trustworthiness should be designed as part of an IoT end-to-end system, considering aspects such as reliability, dependability, safety. Projects are specifically focusing on the ISO TC42. Via the BDVA/DAIRO joint initiative, it is also possible to extend this support to other relevant ISO standards.

EU-IoT Knowledge Areas to SDO Mapping

Knowledge Area	Standardisation	Pre-standardisation	Consortia/Entities
Artificial Intelligence	IEEE	5G-ACIA, 5G-IA, IRTF	AIOTI
Autonomy	ODVA		
Biomedicine			
Biotechnology			
Configuration & orchestration	OGC, W3C/WoT		Linux Foundation, OMG
Cybersecurity	ISO		
Data	ETSI, OGC, BFF	5G-ACIA, 5G-IA	AIOTI, BDVA, Eclipse Foundation, FIWARE, GAIA-X, Linux Foundation, OMA
Energy	CENELEC, IEC, ISO		AIOTI
Infrastructure	3GPP, GSMA, IEEE, ITU-T, LoRA, OCF, oneM2M, ORAN, GS1, IETF, OASIS, OPC	5G-ACIA, 5G-IA, IRTF	VDMA, Weightless, Zigbee, Industry4.0, BBF, FIWARE, GSMA, IIC, LoRA, OCF, OneM2M, ORAN, OMA
IoT architectures	ETSI, GS1, OASIS, ODVA, OPC	IRTF	AIOTI, CNCF, Eclipse Foundation, Linux Foundation, EEC, FIWARE, GAIA-X, IIC, Industry4.0, OAA
IoT interfaces	CENELEC, W3C/WoT		Linux Foundation
Materials			
NG devices	RISC-V		
Printing			
Quality	CENELEC, ISO		
Quantum	IEEE	IRTF	
Robotics	OPC		VDMA, Industry 4.0
Software			

Contributions, Knowledge Area and EU-IoT Scope

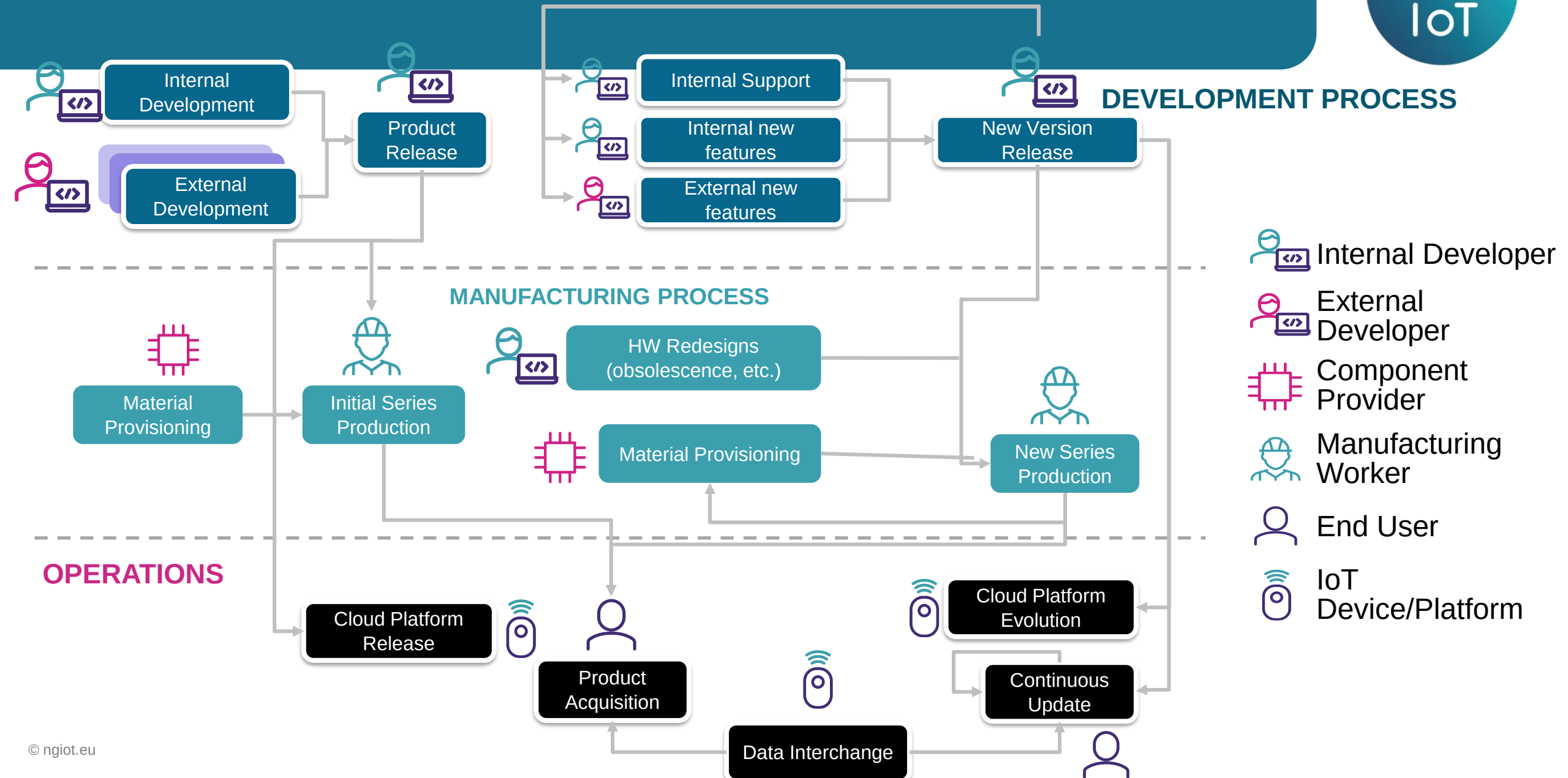


Trustworthiness and IoT Systems

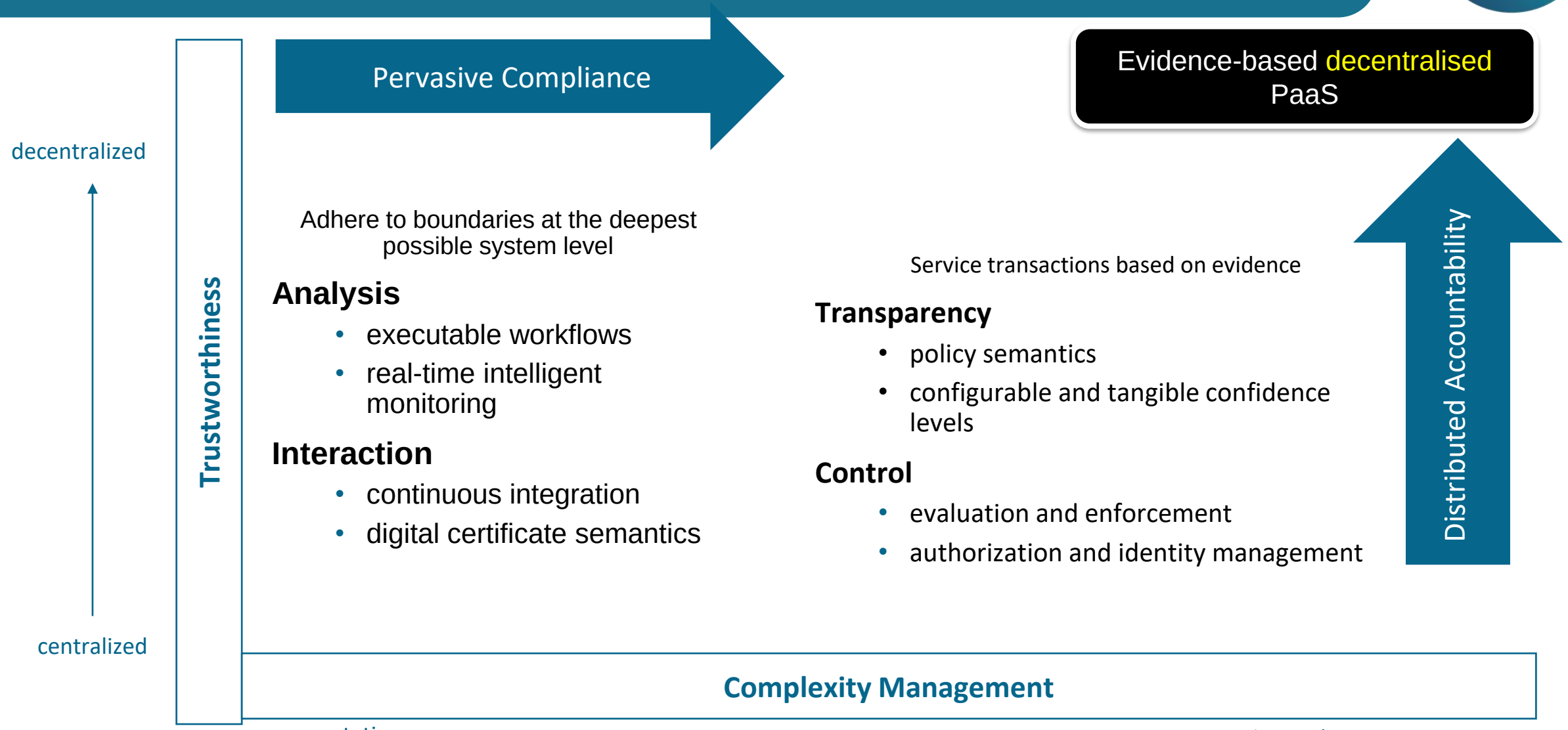
Trustworthiness Systems lack Adaption to IoT – new challenges: service decentralisation, mobility, people-centricity

- Over 10k new apps per week from independent developers
- Billions of IoT sensors gather terabytes of (highly sensitive) data
- Emerging AI systems are not yet robust
- Novel vulnerabilities and threats to security & privacy on a daily-basis
- Loss of control due to „black-box“ development, operation, auditing & certification

Trustworthiness, Layers



How to gain back control towards trustworthy IoT services?



Thank you!

CSA, 30 months, Start 1st October

THANK YOU FOR YOUR ATTENTION

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