



ISO / JTC1 IoT – Workshop *DIN, Berlin, 2016-05-13*

Dipl.-Ing.(FH) Detlef Tenhagen

Standardization in Smart Manufacturing & Industry 4.0

An overview....



Introducing: Detlef Tenhagen

Head of Technology Development / HARTING Electric GmbH & Co KG

- Grad. Engineer in Computer Science, University of applied science, Hannover

National German Standardisation Membership:

- DIN NA 043-01-41 IoT (AA) Chairman
- DIN NA 043-01-31-31.4 RFID Chairman



Deutsches Institut für Normung e. V.

European Standardisation

Group Member of:

- CEN TC 225
-- AIDC „Auto-ID & Data Capture“
- CEN TC225/WG6 „IoT“ (in fact dormant)



European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

International Standardisation Group Member of:

- ISO/IEC/JTC1/WG10 – IoT „Internet of Things“
- ISO/IEC/JTC1/SC31/WGs (1/7) – AIDC
2nd Liaison Officer ISO TC122 & ISO TC104



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Introducing: Detlef Tenhagen (2)

Head of Technology Development / HARTING Electric GmbH & Co KG

International Standardisation Liaison Officer:

- JTC 1 / WG10 – IoT „Internet of Things“

to **ETSI** TC SmartM2M

to **ETSI** IoT Group

to **oneM2M**



ISO/IEC/IEEE P21451-1-4 (Sensei-IoT*), by SC31

to/ from **AIOTI WG 3**

(Alliance for Internet of Things Innovation)

**Industrial Representative from ISO/IEC JTC1/WG 10 to
ISO / TMBG / SAG on Industry 4.0/Smart Manufacturing**

- JTC 1 / SC 31 / different WGs (1/5) on Automatic Identification & Data Capture AIDC
- Different Membership in Study Groups and SIGs and Industrial Consortia:
 - ZVEI, VDMA, AIM (Germany), AIM/RAIN(US), IIC(by Company)

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Top Down View

A look under the umbrella with the standardization „glasses“ on....

- How is the IoT awareness being seen from a „birds view“ ?
- How does it split up into areas to be seen separately ?
- How to analyse the Business and Consumer Perspective on IoT ?
- Project related work already taken on IoT....

Because...

- ...there is no one-and-only Standardization organisation, nor SDO, nor Non-SDO
 - ...for the IoT
 - ...for Smart Manufacturing
- to be recognised*



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Project initiatives in IoT related to SmartManufacturing / Industry 4.0

Src. AOITI WG3

– *How to segment them for a better understanding ?*

Service & App

Area of standardisation in
Consumer related Engagements by
mostly Non-SDO /
OpenSourceSoftware (OSS)

Area of standardisation in Business
related Engagements by mostly
SDO's / partly Non-SDO /
OpenSourceSoftware (OSS)

B2C (e.g.,
Consumer Market)

B2B (e.g., Industrial
Internet Market)

C2C (e.g.,
Consumer Market)

Mostly
communities

Area of standardisation in
Business related
Engagements - mostly very
technical - SDO's / Non-
SDO's herein very active

connectivity

Source: Modified from an initial contribution from Huawei

IoT SDOs and alliances landscape

Src. AIOTI WG3

**B2C (e.g.,
Consumer
Market)**

Service & App

**B2B (e.g.,
Industrial
Internet
Market)**

Connectivity



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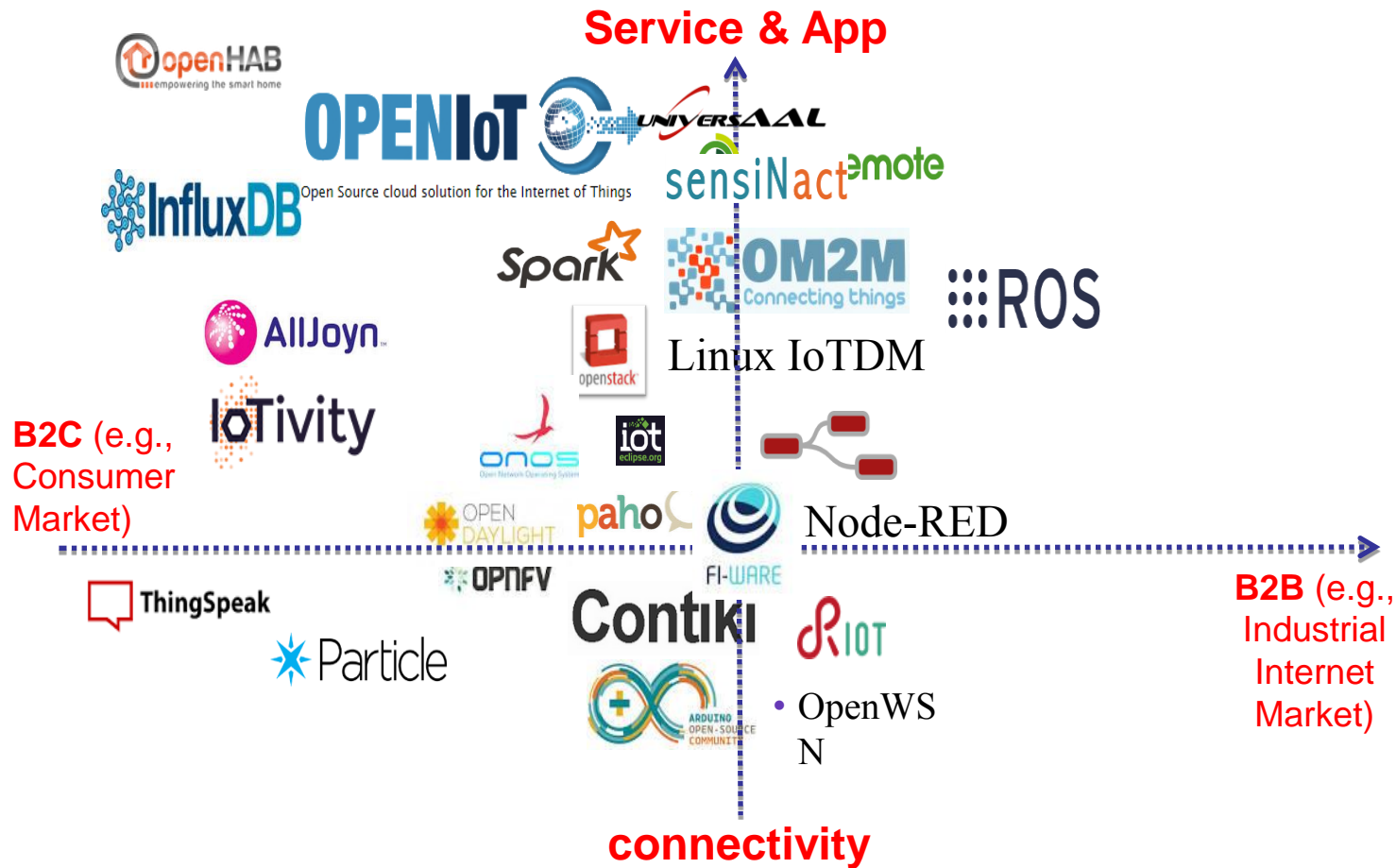
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Open source initiatives OSS in IoT (SM/I4.0)

Src. AIOTI WG3



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Reordering the alliances and by a mapping on knowledge areas

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Mapping of IoT SDOs / Alliances to Knowledge Areas

Security / Safety



Applications

Integration / Interoperability



Devices and Sensor Technology



IoT Architecture



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Mapping of OSS (Open Source Software) / become more important! → Alliances to Knowledge Areas

Security & Privacy

AIOTI



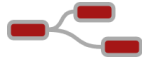
IoTivity



Applications



Integration / Interoperability



Node-RED



Infrastructure
OPEN DAYLIGHT



ThingSpeak

IoTivity



Communication and Connectivity



Contiki

ROS



Devices and Sensor Technology

IoT Architecture



IoTivity



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Src: AIOTI WG3 Report – aioti.eu



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Reordering them by a horizontal and vertical Viewpoint...

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IoT SDOs and alliances landscape – Big Picture

Home/Building

Manufacturing/
Industry Automation

Vehicle/
Transportation

Healthcare

Energy

Cities

Farming



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Horizontal / (Tele-)Communication (LAN/WAN)

Two Domains to detail further highlighted in

RED

Src: AIOTI WG3 Report – aioti.eu

IoT SDOs and alliances landscape on SM/Industry 4.0

Manufacturing/ Industry Automation



In the global/european Context on Standardization there are already many initiatives and Consortia on SmartManufacturing / Industry 4.0 engaged to foster the standardization

Some work in complement 😊 /

Some in paralell ☹️



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Horizontal / (Tele-)Communication (LAN/WAN) with SmartManufacturing / Industry Relation



Down to the European view

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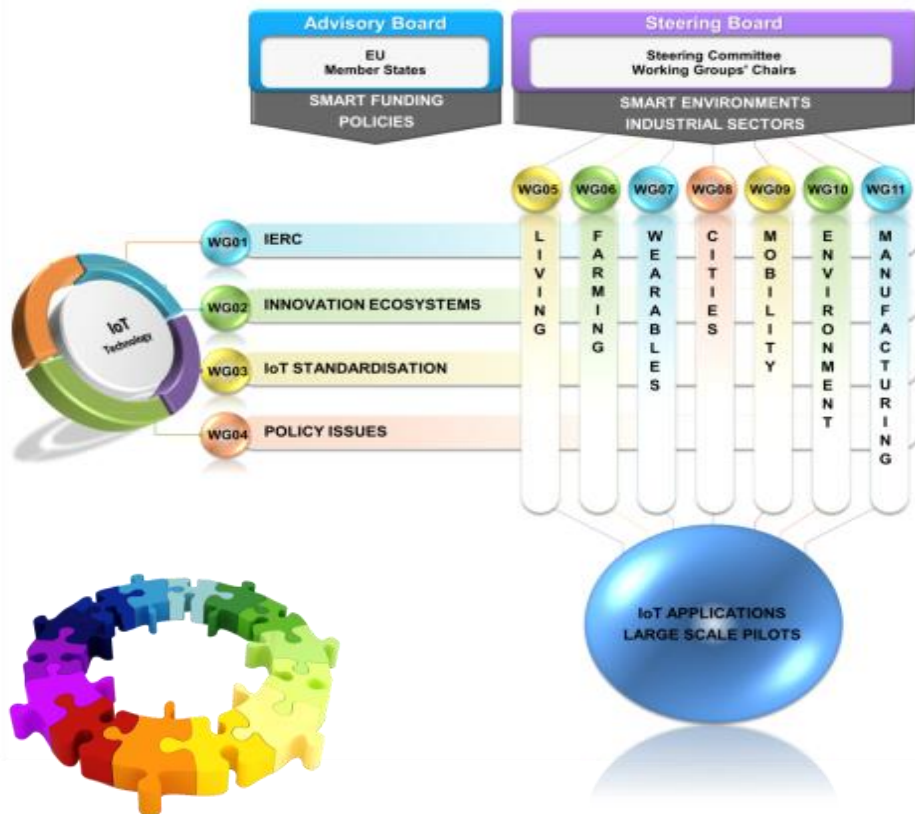
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EC IoT Activities the „umbrella“ by AIOTI

Covered by Liaison in JTC1/WG10/IoT (Sara Norman(SIS) / Myself)

ALLIANCE FOR INTERNET OF THINGS INNOVATION - AIOTI



- **WG 01: IoT European Research Cluster**
- **WG 02: Innovation Ecosystems**
- **WG 03: IoT Standardisation**
- **WG 04: Policy Issues (Trust, Security, Liability, Privacy)**
- **WG 05: Smart Living Environments for Ageing Well (e.g. Smart House)**
- **WG 06: Smart Farming and Food Security**
- **WG 07: Wearables**
- **WG 08: Smart Cities**
- **WG 09: Smart Mobility (Smart Transport/Smart Vehicles/Connected Cars)**
- **WG 10: Smart Environment (Smart Water Management)**
- **WG 11: Smart Manufacturing**



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EU Rolling Plan: Actions for Advanced Manufacturing and IoT

Advanced manufacturing	3.4.6	1	Common communications standards and a reference interoperable architecture for connections between machines (M2M) as well as with sensors and actuators in a supply chain environment are a basic need and a priority
		2	E-skills standards should be checked as well as to take into account the manufacturing skills for future manufacturers, M2M, rapid prototyping and others
		3	Review the recommendations for actions in the "German Standardization Roadmap Industrie 4.0"
		4	Study is needed to identify and analyse opportunities for revisions of existing standards (communications, M2M) or new standards
		5	Increase consideration of standardisation in research projects
Internet of Things	3.5.6	1	Continue activities on standards landscaping and gap analysis as set up in ETSI with a Specialist Task Force
		2	Establish some cooperation amongst SDOs working on standards landscaping and gap analysis in order to leverage on the results and reduce duplication of work and efforts
		3	Address the semantics of standards for better data interoperability.
		4	High level events



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Priority 4: Digital Manufacturing / Industry 4.0

	Action	Time frame
4.1	Facilitate cooperation between European business from different sectors and participation in Standards Bodies	
	4.1a Facilitate the incorporation of sectoral input into standardisation	2018
	4.1b Identify legal barriers	2018
4.2	Promote interoperability in the manufacturing sector	
	4.2a Promote global standards work ensuring it meets the EU needs	2017
	4.2b Promote high quality, and accessible cross- sector standards for hyper connected environments	2018
4.3	Promote trusted solutions	
	4.3a Support pilot projects and cluster building	2017
	4.3b Promote adoption of best practices	2017
	4.3c Support plug-testing of the standards.	2018

Priority 5: IoT

	Action	Time frame
5.1	Encourage integration of vertical sectors in the standardisation activities	
	5.1a Standardisation deliverables to ensure integration with vertical sectors	2016
	5.1b Towards coherent Semantification	2016-2018
5.2	Facilitate cooperation of Standards Bodies	2016
5.3	Promotion of pilots and best practices in advanced areas	
	5.3a Ensuring feedback on standardisation functional gaps	2017
	5.3b Clarify dependencies between legal issues and standardisation	2017

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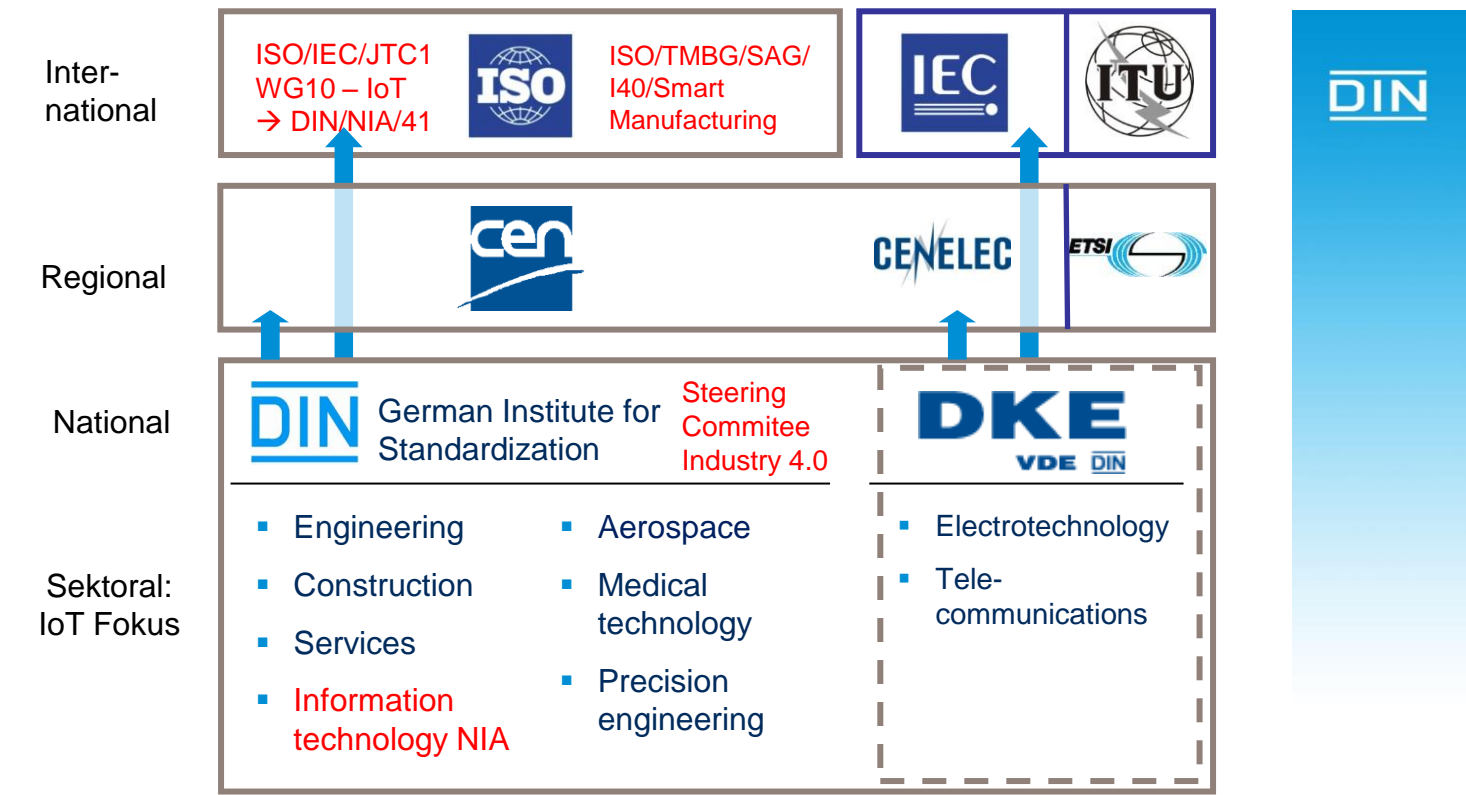
Down to the German NB View.... *(or any else national body)*

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Structure of national SDO Engagements in Standardization in Example of NB Germany – Consensus based development regarding Industry 4.0 / Smart Manufacturing primarely to ISO/IEC Mirrors and WG/SAG

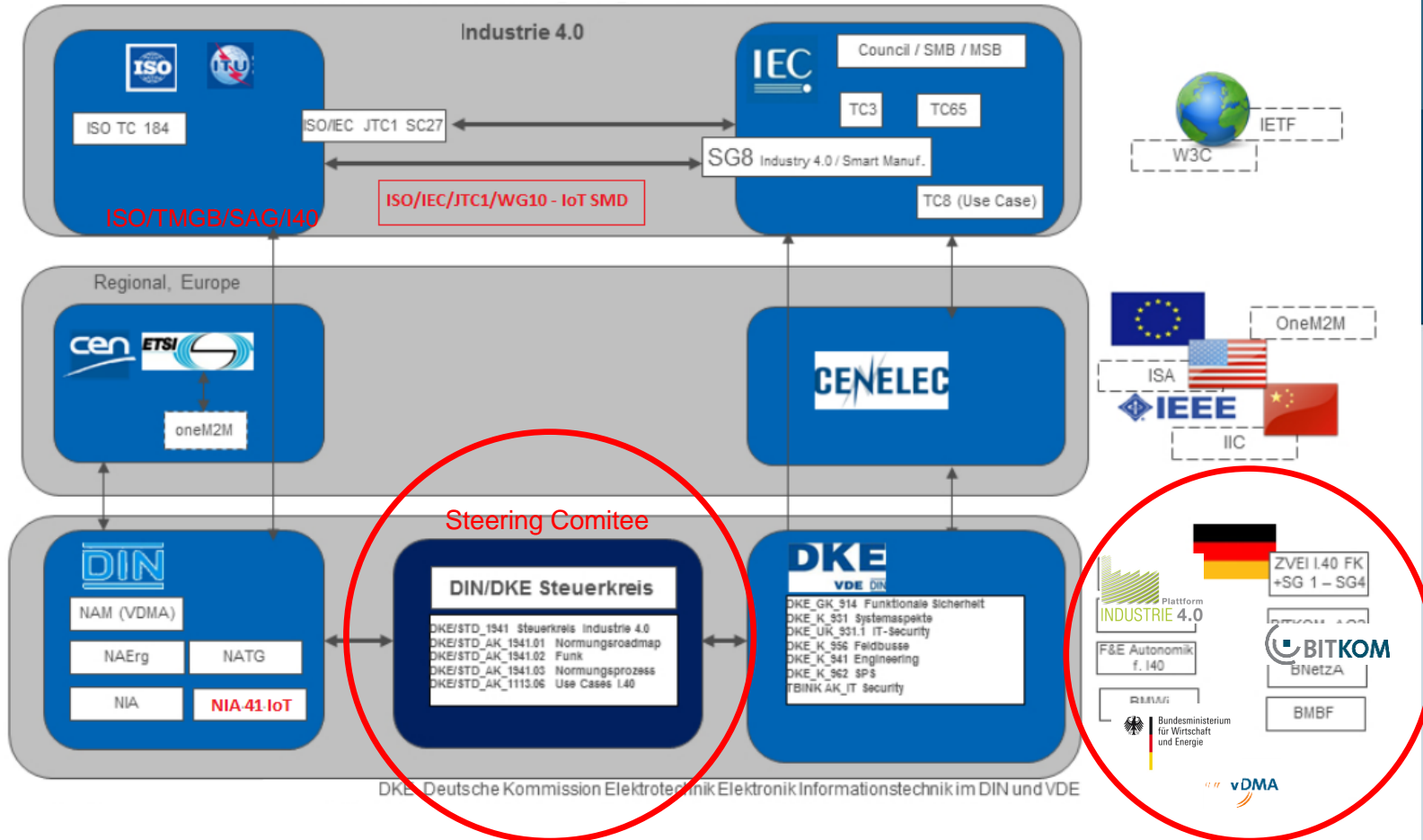


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International relation of German SDO's and Non-SDO's engaged in Industry 4.0 – SmartManufacturing (VDI/GMA Bitcom VDMA DIN/DKE ZVEI BMWI

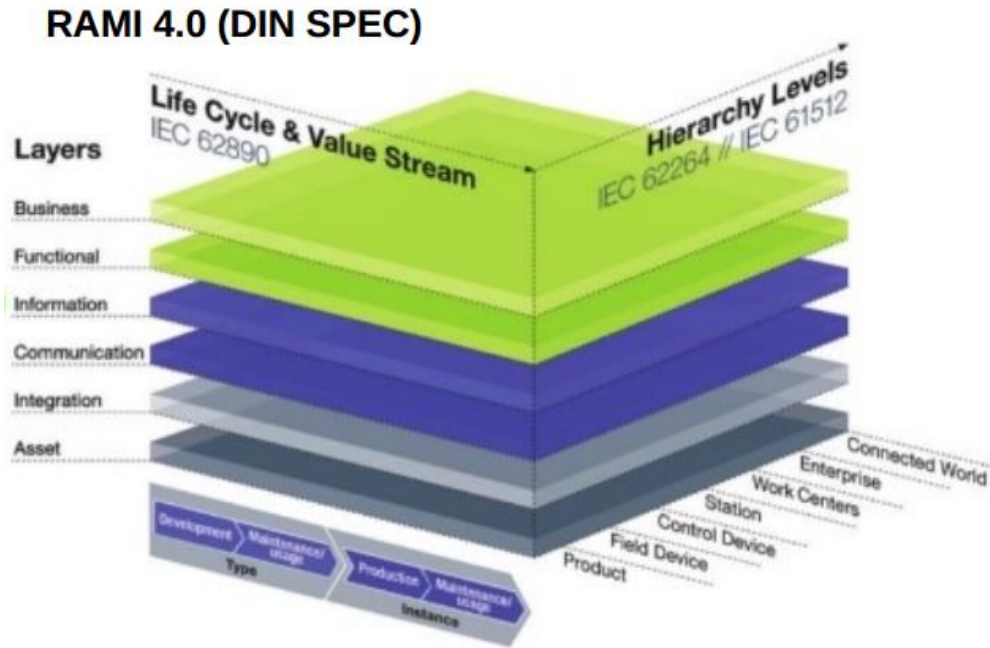


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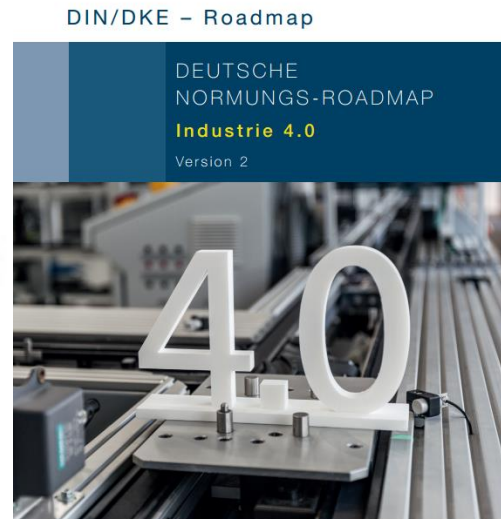
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German achieved results by activities in standardizing SM/I4.0 – Cooperation with IIC



DIN SPEC 91345 is under development ...

German Standardization
Roadmap I4.0 Ver.2 is
released ! (Eng)



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Next steps in Standardization on IoT

... to broaden the joint work on it

→ **Open Source and Non-SDO's based Communities** as well as **Consortia's** are setting “de-facto” standards

→ so becoming a **game-changer in standardization ?!**

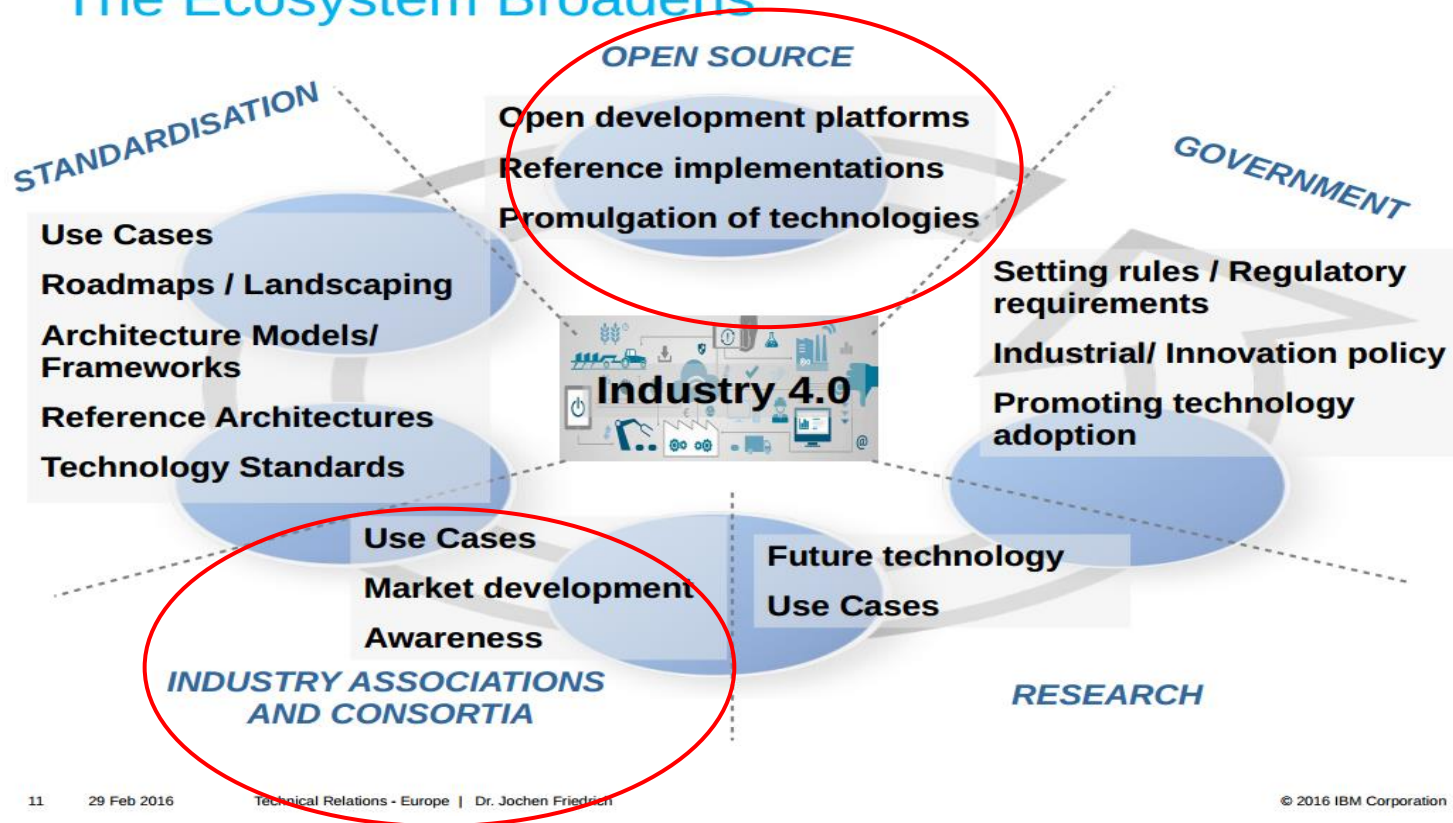


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The Ecosystem Broadens



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Src: Proposed in SC Industry 4.0 by Dr. Jochen Friedrich (IBM)

Tbd: Impact of OSS and UCS to further standardisation on SM/I.40 ? More dominating Industry Fora and Consortia rather than classical SDO's ? → How to be performed by classical SDO's ?

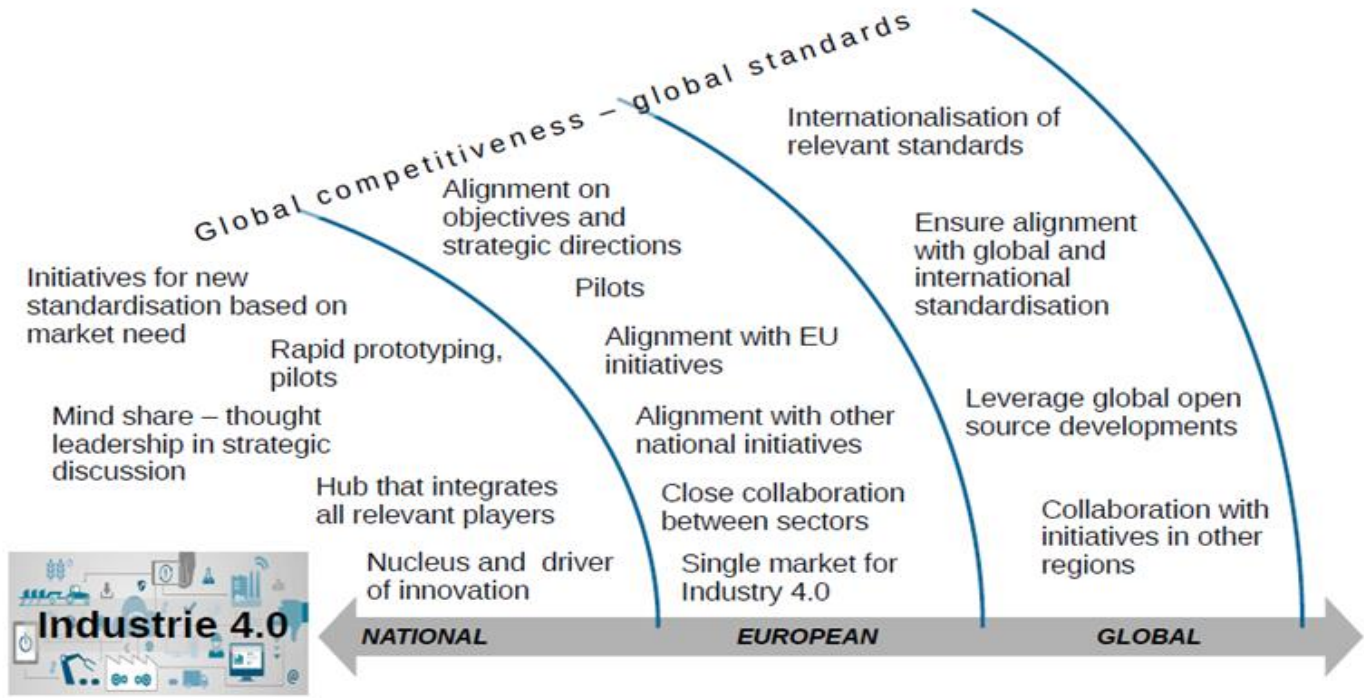
German National Body Mirror Committee to ISO/IEC/JTC1/WG10 – IoT at DIN NIA 041 – Aspects of future work to discuss in our today Workshop

— Src: Proposed in SC Industry 4.0 by Dr. Jochen Friedrich (IBM)

IBM Technical Relations - Europe



Industrie 4.0 and Standardisation – Global Radar



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German National Body Mirror Committee to ISO/IEC/JTC1/WG10 – IoT at DIN NIA 041 – Aspects of future work to discuss in our today Workshop

– Src: Proposed in SC Industry 4.0 by Dr.Friedrich (IBM)

- There is **no such thing** as “THE standard for Industry 4.0”.
- **Initiatives** for **new standards** should be **based on market need, driven by industry** and other **stakeholders**.
- **Collaboration** between **standards bodies** and to promote **mutual awareness** and understanding of the different industry sectors.
- There’s **no need** for **additional coordination groups**.
- **Pilot** and **real-life implementations** will lead to incremental **improvements of standards**, & identification of possible **gaps**.



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– *Other aspects to be discussed on panel session:*

- To enable more **Co-Working** between **SDO's** and **Non-SDO's**
- To be open to **Open-Source Development** as becoming more and more important especially to the IT Side of IoT !
- To concentrate on the Small / Medium Business Company and organization and enable them to realized Industry 4.0 and Smart Manufacturing as being the most important kind of business especially in Europe → one of the important findings of the NB Germany, NIA -041 IOT
- To include **Customer** and **Industrial Organisations** i.e. like **NAMUR** and **ZVEI, VDMA, BITCOM** in **detail of our work and to** invite them to sustain and foster the entire standardization process **on Industrial IoT**
- To take **regard and appropriate actions** on **PIA** (Privacy Impact Assement – according to the **european legislation & directives**



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Q & A?

Thank you !

D. Tenhagen

Chairman of: **DIN NIA** National committee on IoT
Standardization AA 043-1-41



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