

# REFERENZARCHITEKTUREN FÜR DAS INDUSTRIAL INTERNET

Dirk Sianna, Vice President  
Bosch Software Innovations

# The Bosch Group – Business Sectors

## Mobility Solutions



## Industrial Technology



## Energy and Building Technology



## Consumer Goods



Bosch Software Innovations

# [Industrial] Internet of (Things|Everything)

# Examples



**Indego Connect**  
Automatic Lawn Mower

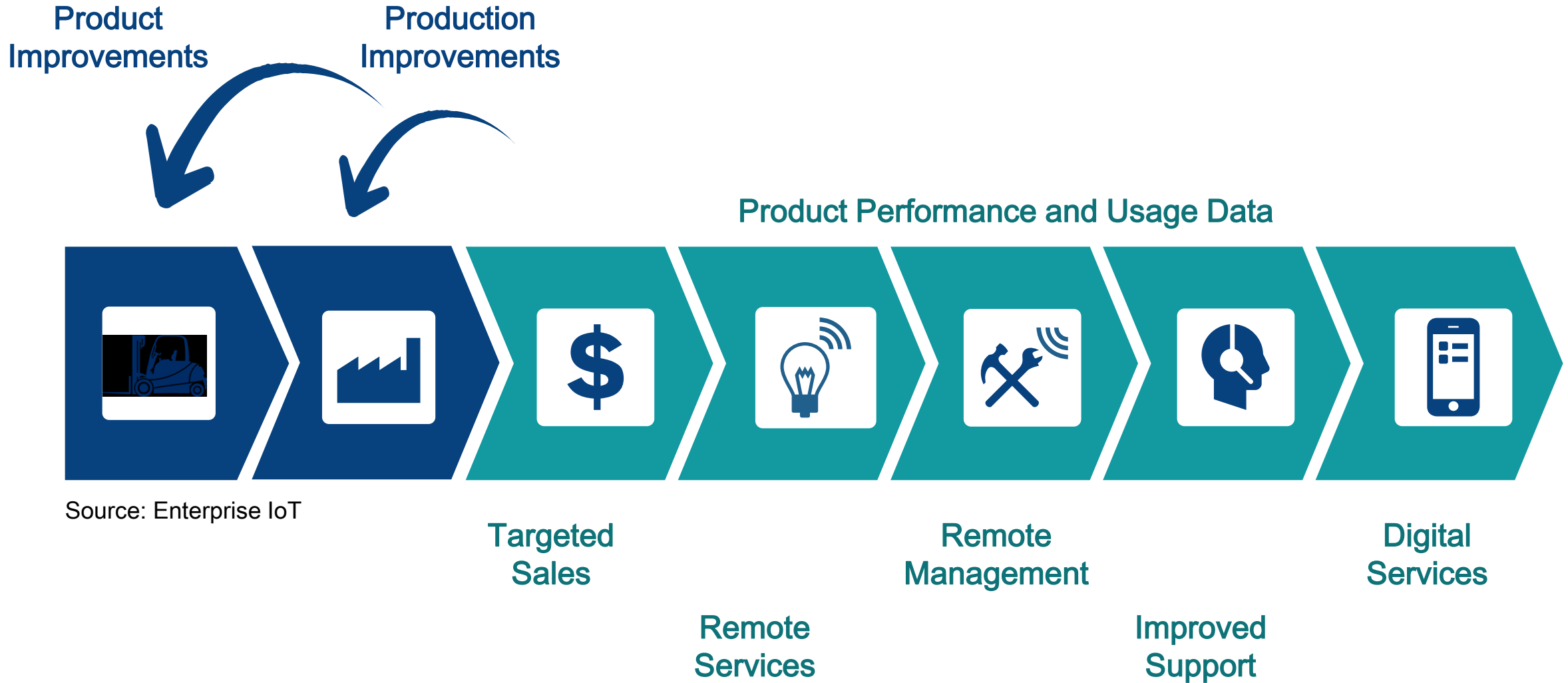


**sFDE**  
structured Field Data Exploration



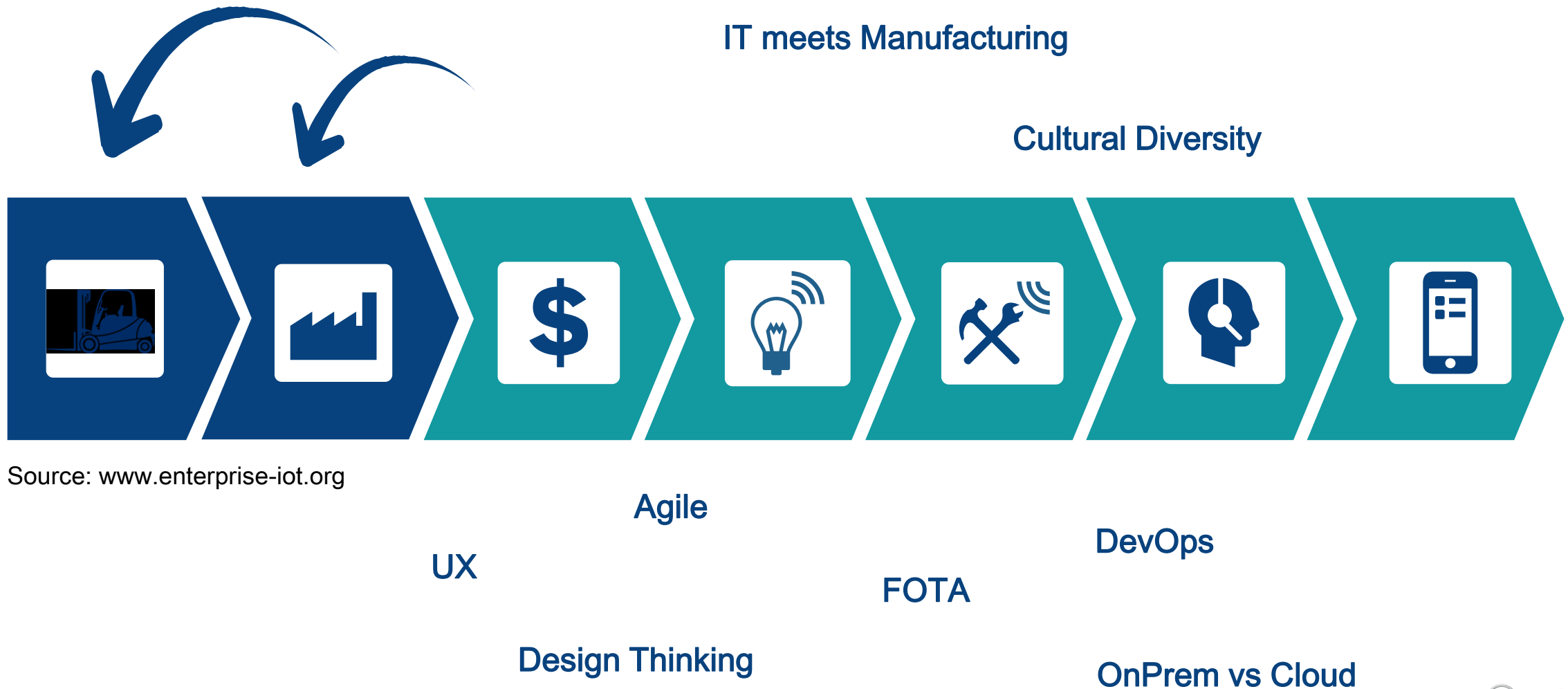
**Inventory Management  
for Professionals**

# Opportunities of the IIoT Value Chain Transformation





# Challenges of the IIoT Value Chain Transformation



Source: [www.enterprise-iiot.org](http://www.enterprise-iiot.org)

# Clash of two worlds

We need ways to build bridges – in both directions



## „Machine Guys“

- „Brownfield“
- Strong company heritage, risk adversity
- Corporate career is the norm
- Domain: Physics, Engineering
- „Think Big“
- Long QA & release cycles

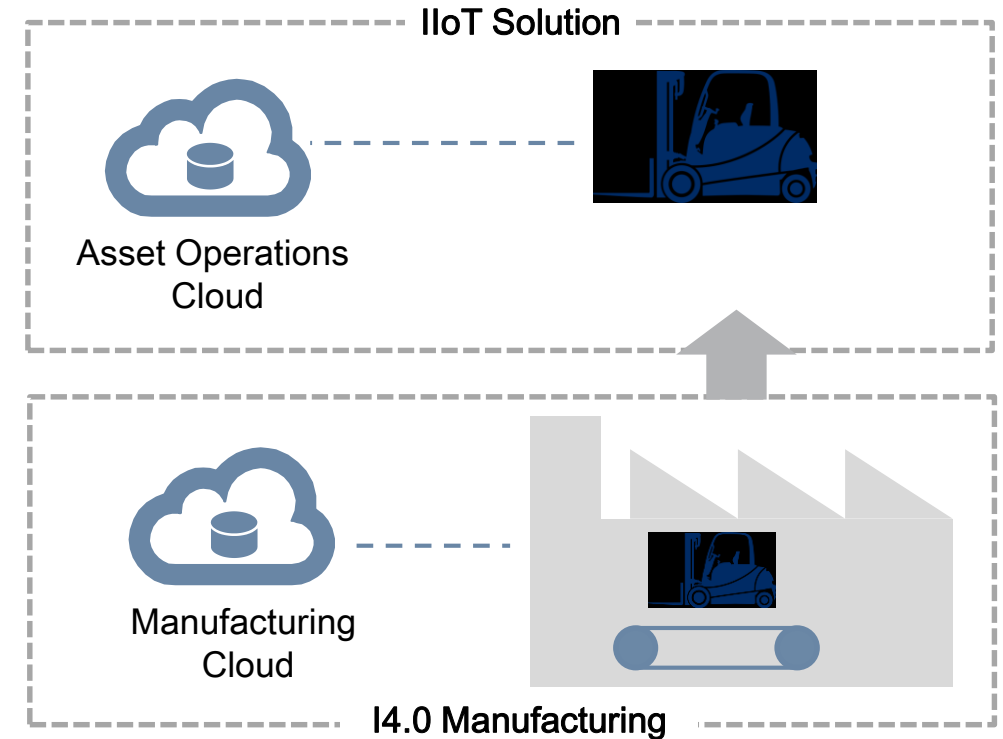
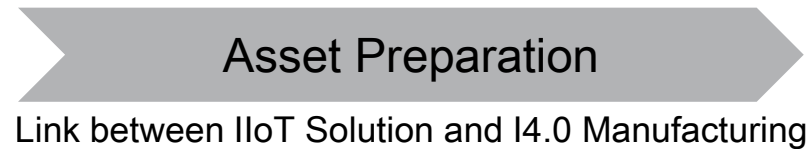
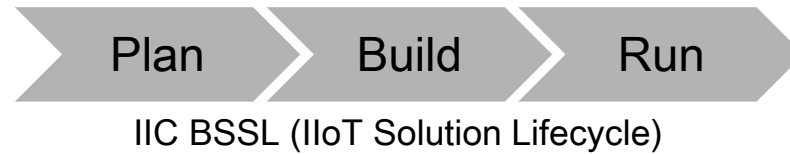


## „Internet Guys“

- „Greenfield“
- High-risk, VC-driven culture
- Entrepreneurial management and employees
- Domain: IT, Services
- Focus on point solutions
- Perpetual beta

Source: enterprise-iot.org

# Key: Building Bridges





# Collaboration between IIC and Industry 4.0



Zurich, 11/2015:  
Exploratory  
Workshop on  
IIC/I4.0 Collab.



Bosch ConnectedWorld,  
Berlin 03/2016: Presentation  
of IIC/I4.0 collaboration,  
first joint Testbed proposal



Chicago, 05/2016:  
Joint Workshop on  
architecture, testbeds  
and standardization



IIC & I4.0 WorldTour  
Walldorf, Germany  
Turin, Singapore, etc.

1

**Complementary  
Domain Focus**

2

**Cross-Domain  
Interoperability**

3

**Testbed  
Collaboration**





1

DOMAIN FOCUS AREAS ARE COMPLIMENTARY

2

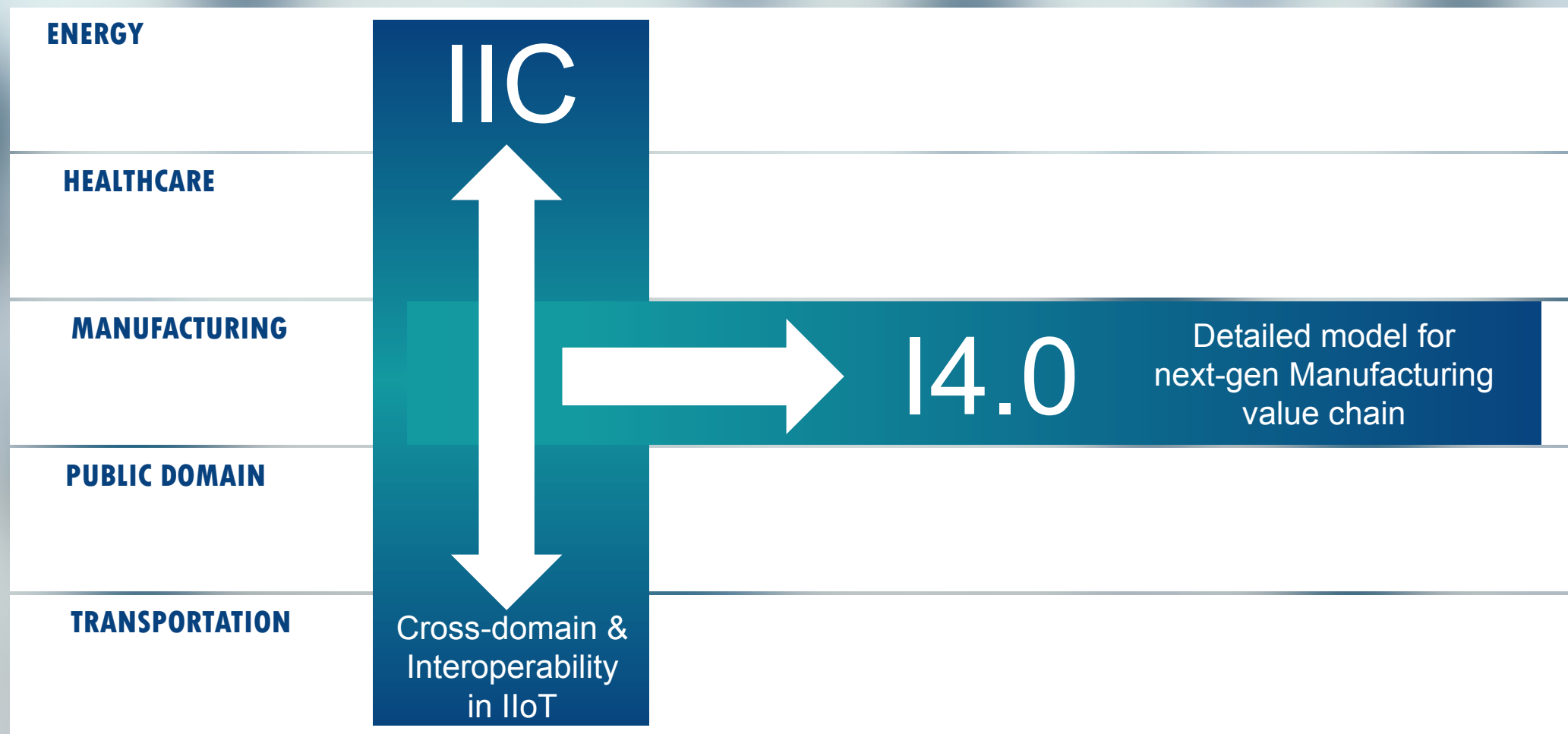
A CLEAR MAPPING BETWEEN BOTH ARCHITECTURES  
WILL ENABLE CROSS-DOMAIN INTEROPERABILITY

3

COLLABORATION ON TESTBEDS / TEST FACILITIES AND  
INFRASTRUCTURE WILL ENSURE INTEROPERABILITY  
ON THE TECHNICAL LEVEL

1

## DOMAIN FOCUS AREAS ARE COMPLIMENTARY

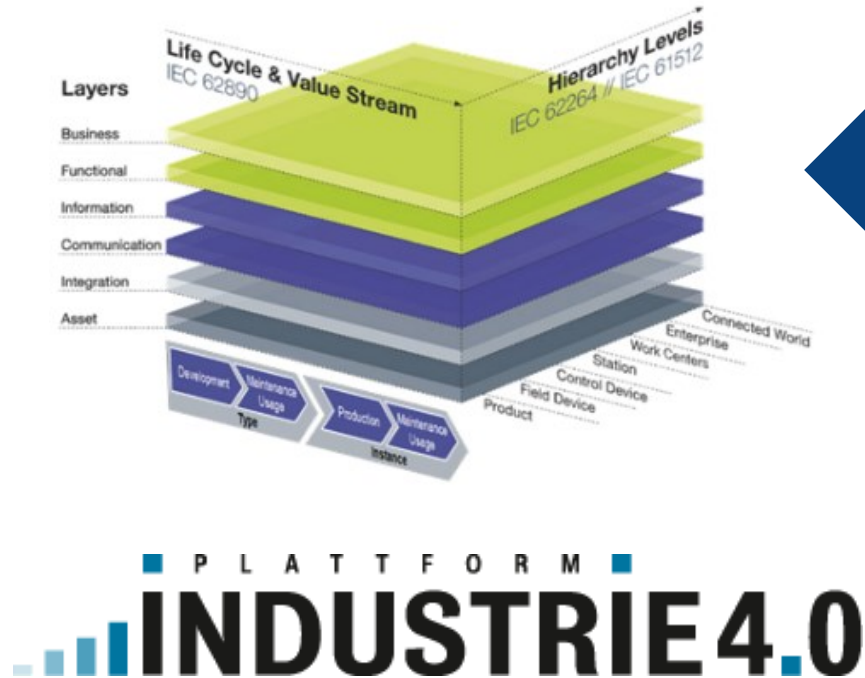




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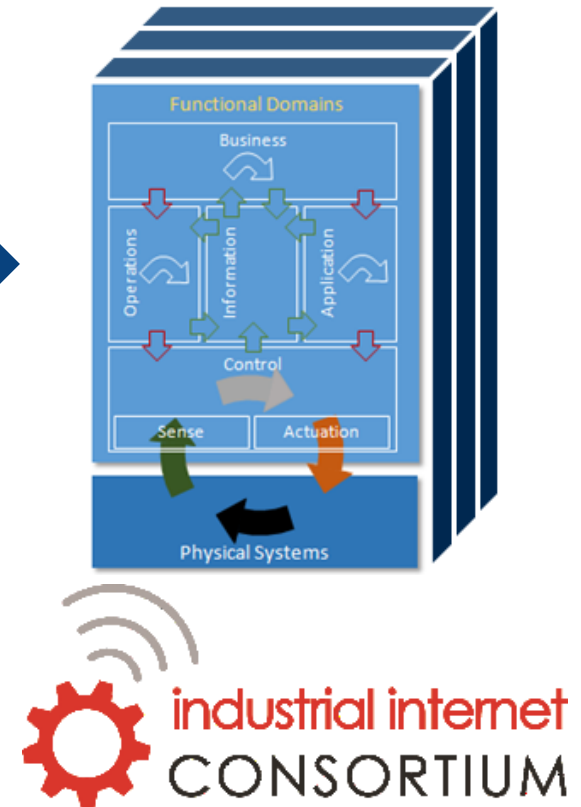
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## RAMI4.0



Interoperability

## IIRA



3

COLLABORATION ON TESTBEDS / TEST FACILITIES AND INFRASTRUCTURE  
WILL ENSURE INTEROPERABILITY ON THE TECHNICAL LEVEL

PLATFORM  
**INDUSTRIE4.0**



**TEST**

# Example: IIC Testbeds





# Spec or Code first?

## Specification body



Nothing can be mandatory in an [OCF spec](#) unless an open source reference implementation is available

IP policy: RANDZ  
(Reasonable and non-discriminatory w zero royalty)

OCF owns certification (mark, tools, program)

## Open Source Project



Sponsored by OCF and hosted by Linux Foundation

IP policy: Apache 2.0  
(Provides patent protection from code contributor.)

OCF membership not required to be part of the open source project

Source: <https://www.slideshare.net/brecky558/happily-married-or-warring-factions-open-source-and-standards>

# Open Source (and|vs) Standards

## STANDARDS / SPECS

Focuses on the What

Specs enable certification tests which drive interoperability

A standard typically has many implementations

Assertion of IP by getting it into the spec

Industrial efficiency – volume economics, commoditization, etc.

## OPEN SOURCE

Focus on the How (this is work!)

API compliance ensures things work together

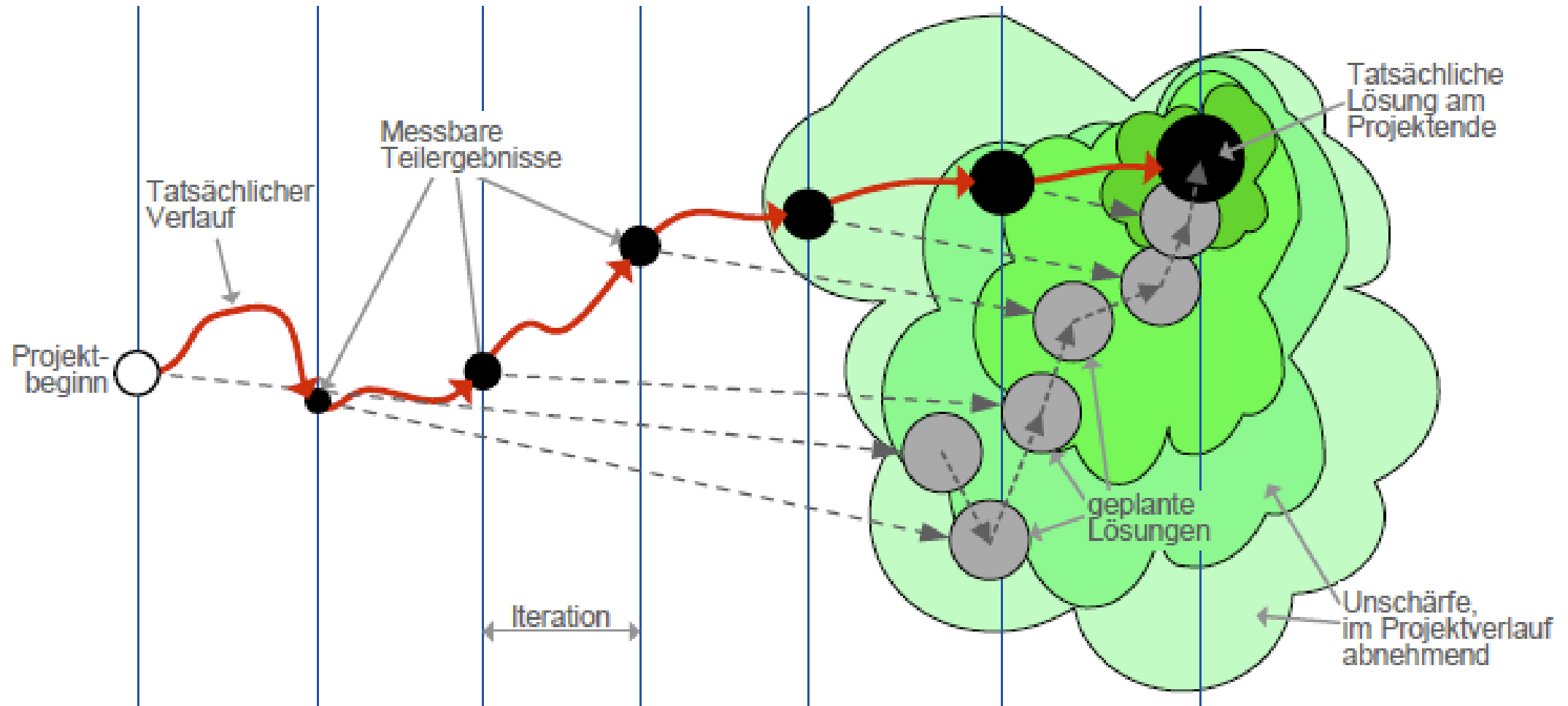
Some open source projects have a single implementation, others more

Assertion of an implementation by making the code available for others to distribute

Accelerated development of commercial solutions and a community of maintainers

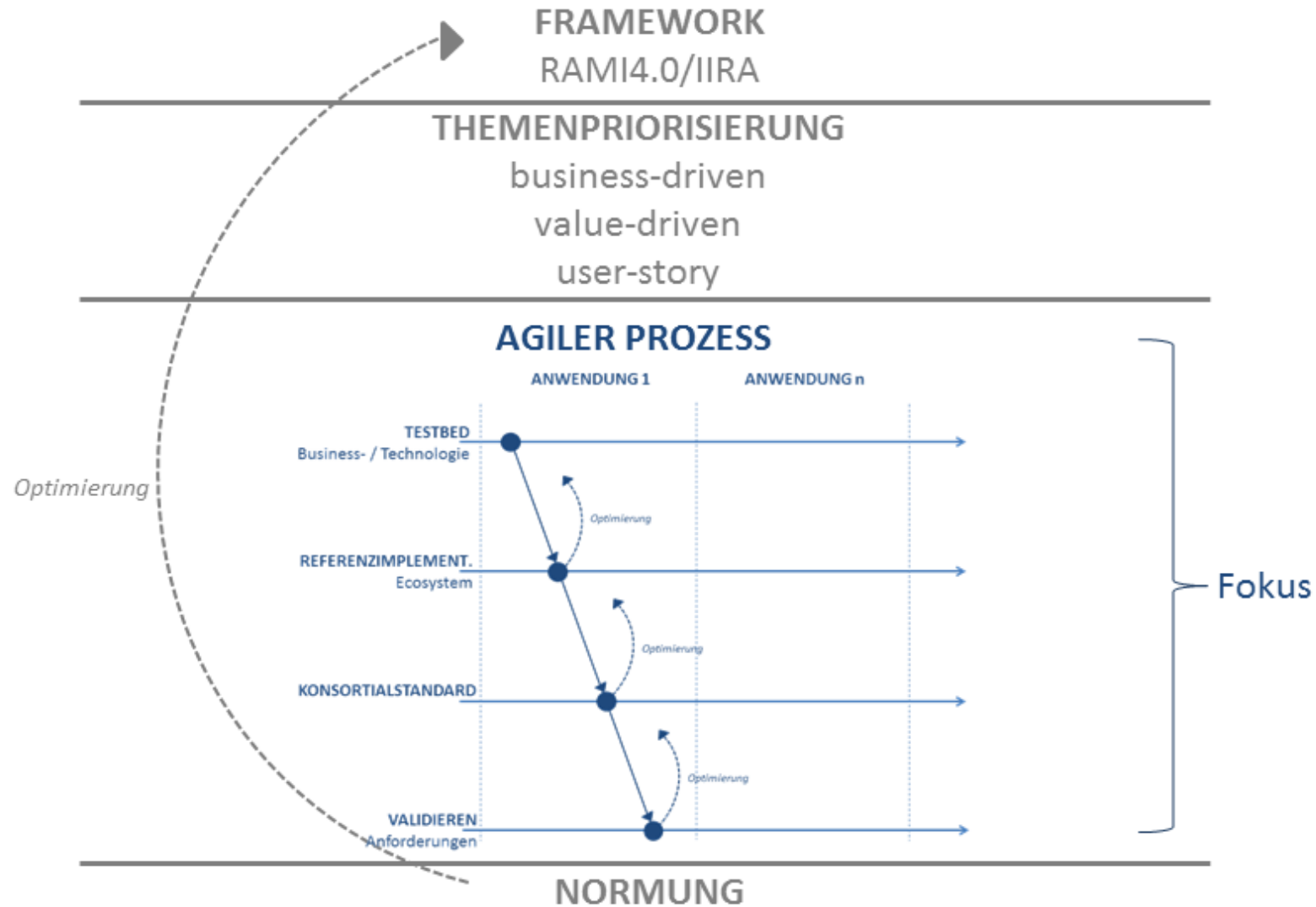
Source <https://www.slideshare.net/brecky558/happily-married-or-warring-factions-open-source-and-standards>

# Mit „Unschärfe“ umgehen lernen



[www.oose.de](http://www.oose.de)

# ZVEI Positionspapier „Agile Standardisierung“



# Keynote Chancellor Merkel at #FoGip16



*“I am very pleased that the Platform Industrie 4.0 is now working together with the American [System] IIC on standardization issues. This will help moving things forward. And we all know: If you are defining the standards, you are in a pole position.”*

[https://www.youtube.com/watch?v=DU\\_QFDYJ9M4](https://www.youtube.com/watch?v=DU_QFDYJ9M4)

<https://www.bundesregierung.de/Content/DE/Rede/2016/04/2016-04-12-rede-merkel-forschungsgipfel.html>