

REFERENZARCHITEKTUREN FÜR DAS INDUSTRIAL INTERNET

Dirk Siama, 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 Mover

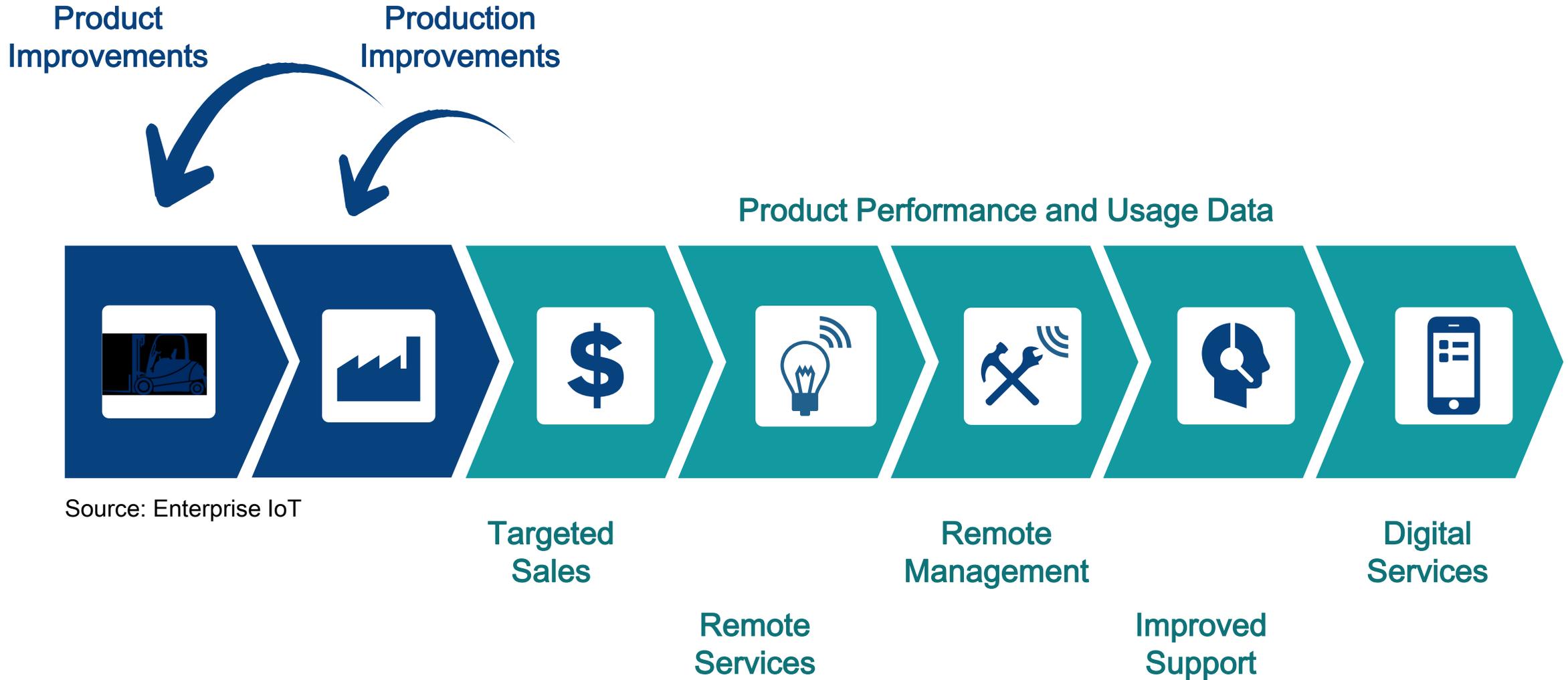


sFDE
structured Field Data Exploration



Inventory Management
for Professionals

Opportunities of the IIoT Value Chain Transformation



Challenges of the IIoT Value Chain Transformation



Source: www.enterprise-iiot.org

UX

Agile

FOTA

DevOps

Design Thinking

OnPrem vs Cloud

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

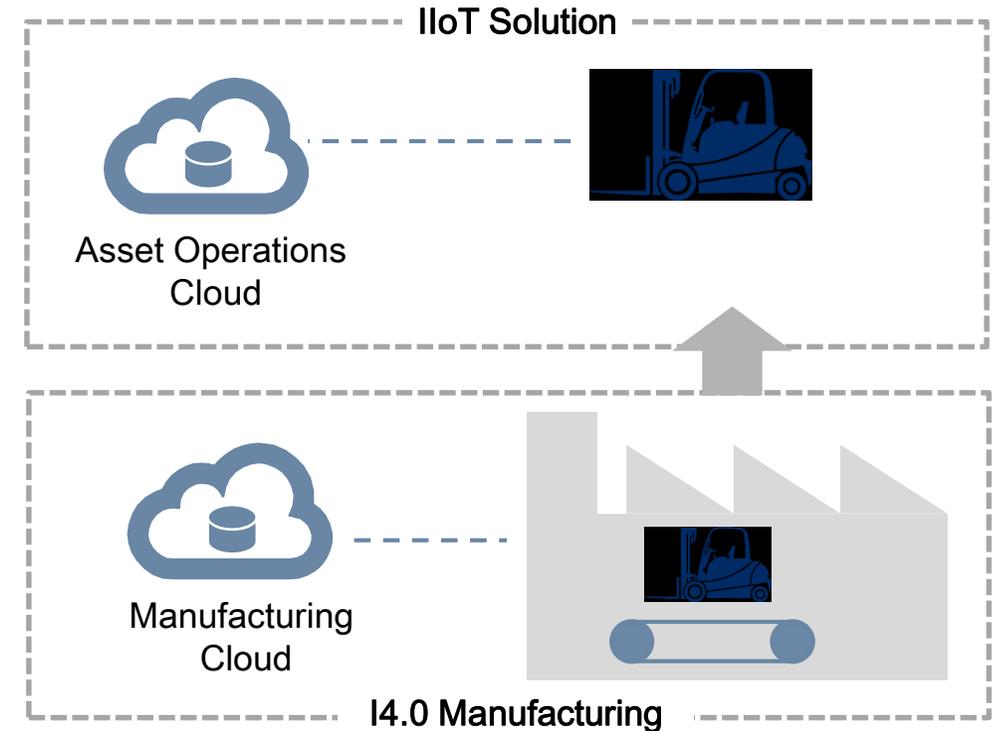
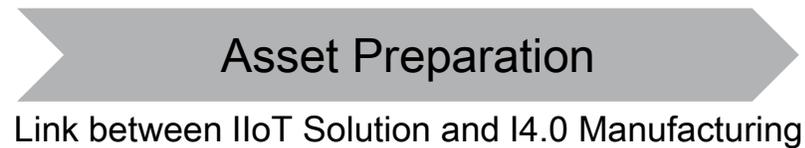


„Internet Guys“

- „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

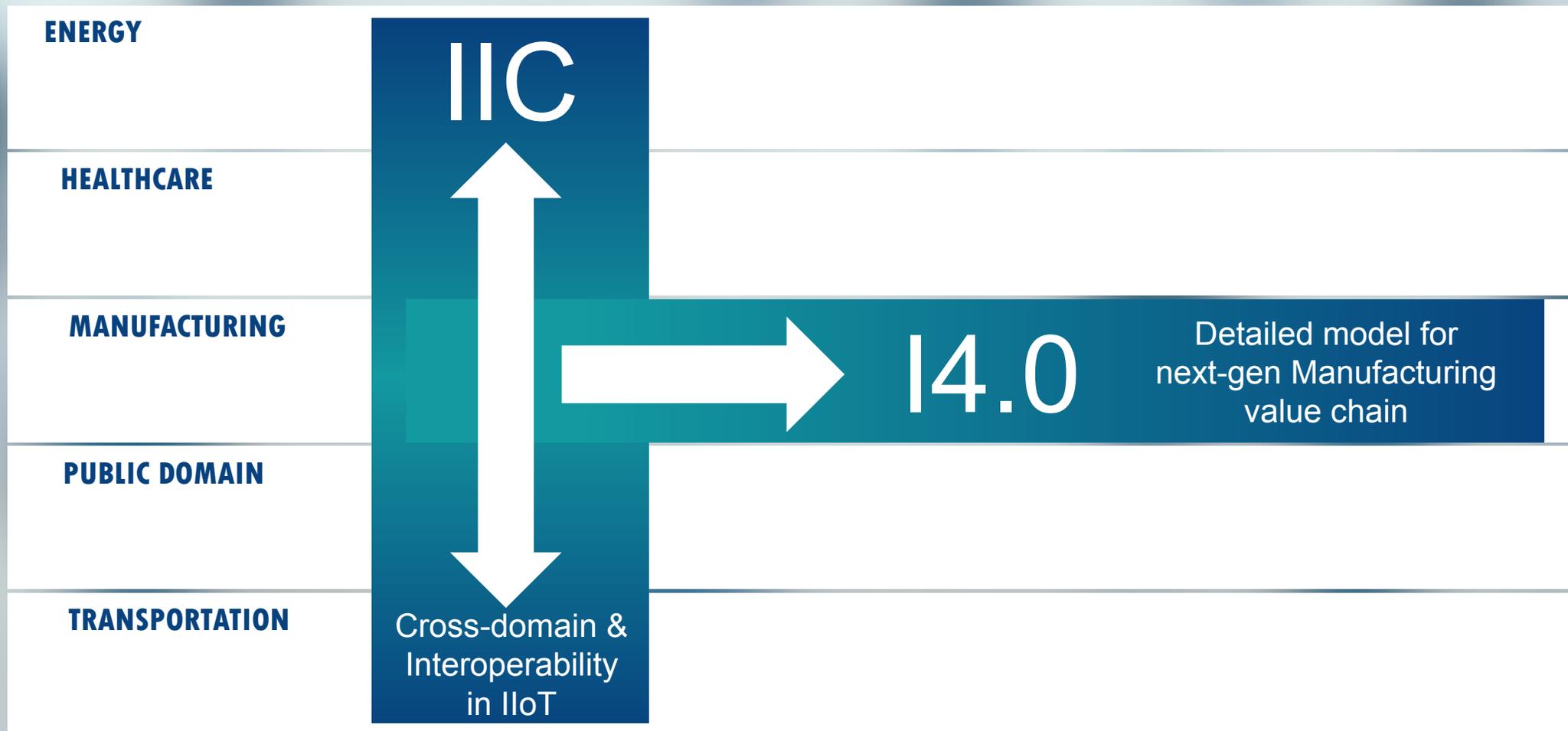
3

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



1

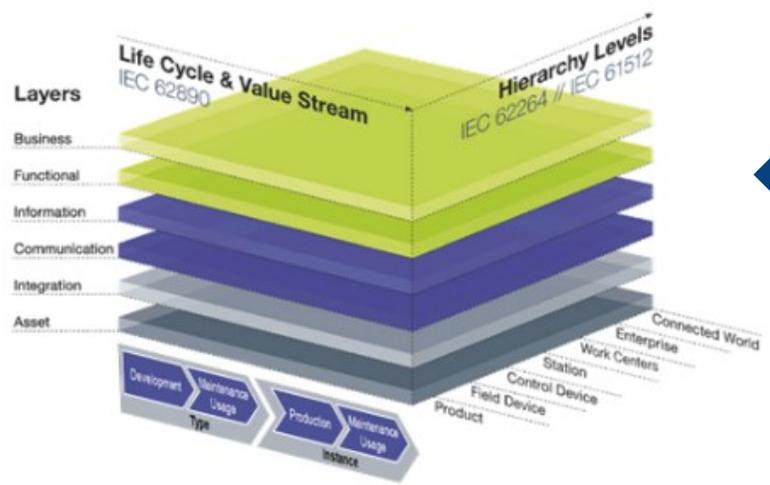
DOMAIN FOCUS AREAS ARE COMPLIMENTARY



2

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

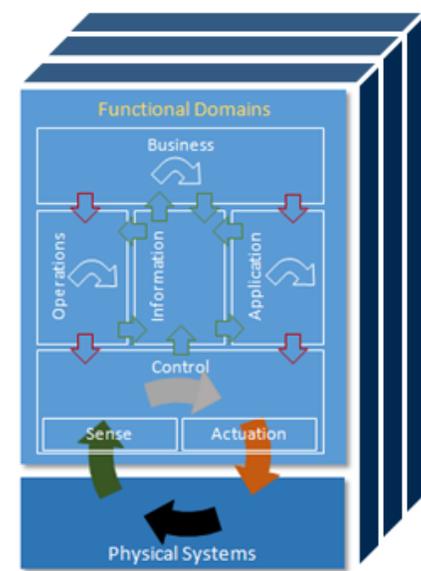
RAMI4.0



PLATTFORM
INDUSTRIE4.0



IIRA



industrial internet
CONSORTIUM

3

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



PLATTFORM
INDUSTRIE 4.0



industrial internet
CONSORTIUM



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

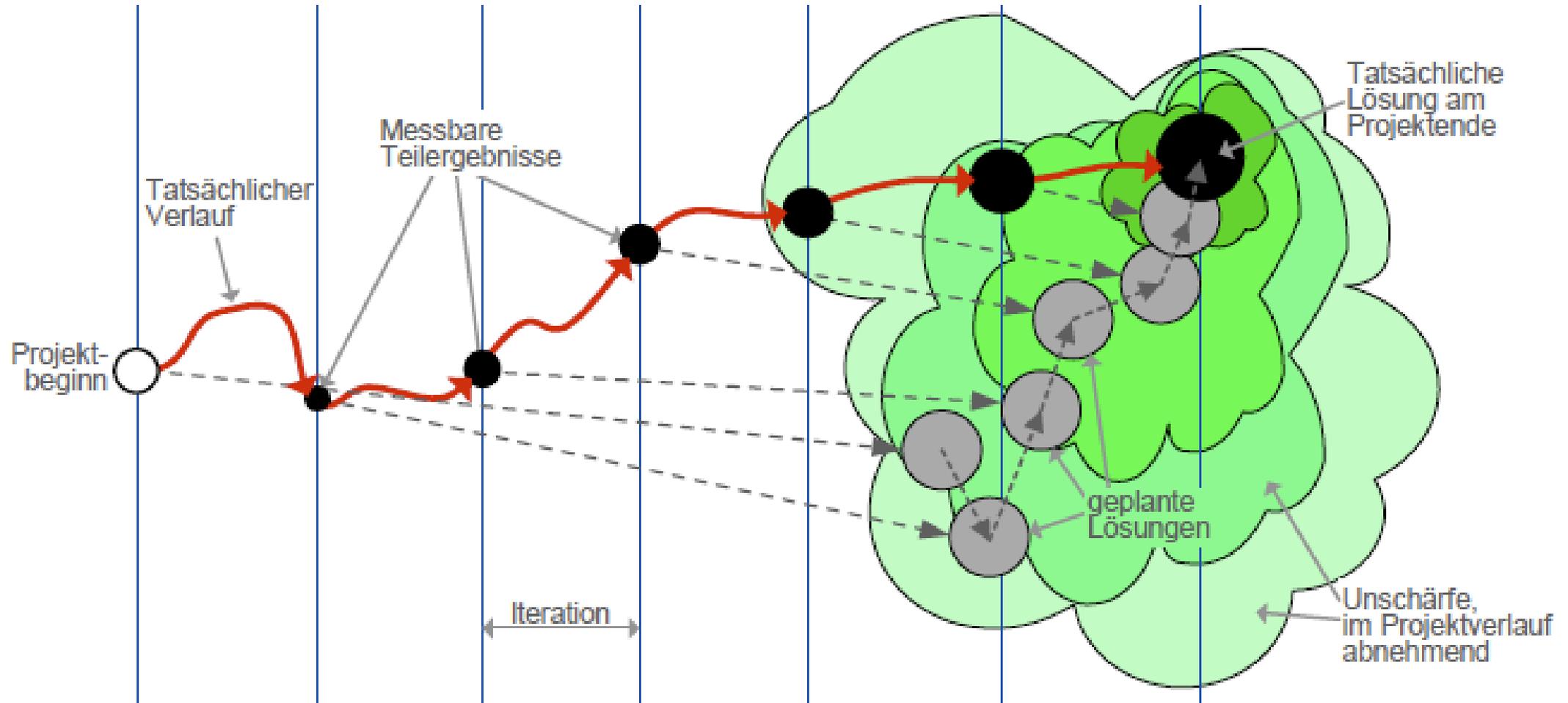
Some open source projects have a single implementation, others more

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

Accelerated development of commercial solutions and a community of maintainers

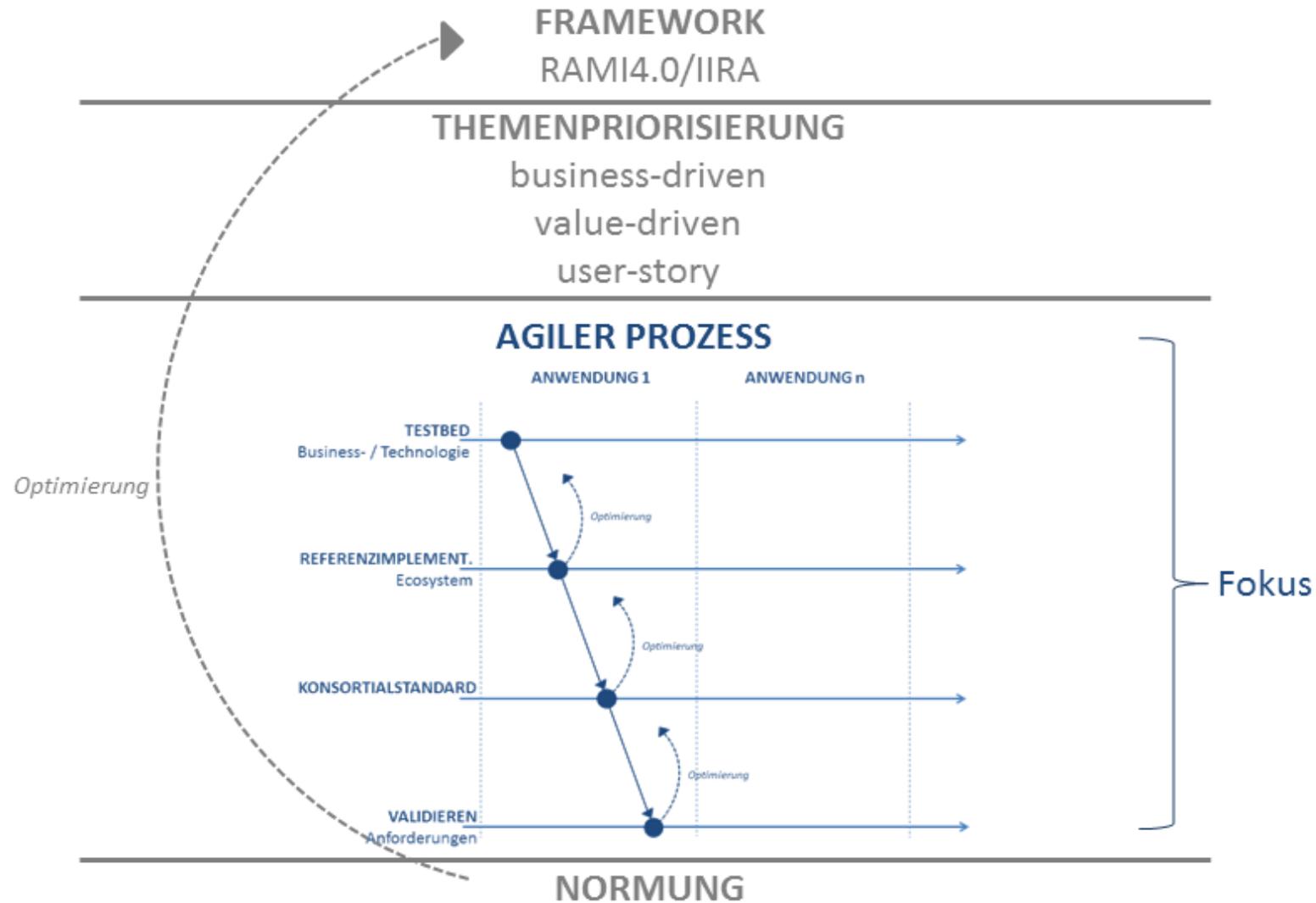
Source <https://www.slideshare.net/brecky558/happily-married-or-warring-factions-open-source-and-standards>

Mit „Unschärfe“ umgehen lernen



www.oose.de

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