



Federal Ministry
for Economic Affairs
and Energy



DLR Projektträger



Economic relevance of Smart Services technologies

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German Aerospace - Program Management Agency for
the German Ministry for Economic Affairs and Energy



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Service-Oriented Computing,
June 27 – July 1, 2016 in Crete, Greece

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- » drive research, innovation and education
- » support policies, programmes and projects
- » operate nationally, across Europe and internationally
- » network disciplines, industries and stakeholders
- » stand for dedication and professionalism

CONSULTING
EVALUATIONS
ANALYSES

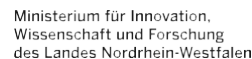
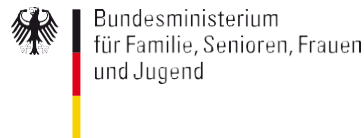
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- » Federal ministries, state ministries, public authorities
- » Foundations, associations, research organisations
- » European Commission, foreign government bodies



German Ministry for Economic Affairs and Energy

Unit VIB4 „Digital Technologies“

Trusted Cloud: 2010-2015; 14 projects; 50 m€

Smart Data: 2014-2017; 13 projects; 30 m€

Smart Service Welt: 2015-2018; 16 projects; 50 m€

Autonomics – Autonomous and simulation-based systems for SME

Phase 2 („Industry 4.0“): 2013-2017; 15 projects; 42 m€

Phase 3 („PAICE“): Product Engineering, Industrial ICT infrastructures, 3D technology integration, Service Robotics; 12 projects, 50 m€

Connected Living – networking the home: 2010-2016; 6 projects; 13 m€

Electric Mobility

Phase 2 („Smart car, smart grid, smart traffic“): 2012-2016; 18 projects; 77 m€

Phase 3 (Commercial e-vehicles): 2015-2019; approx. 30 m€

Smart Service Welt: The Challenges

New business models are driving the digital transformation of the economy

Yesterday:

Non-material goods, logistics:
Trade, Entertainment, Finance



Today:

Local Services:
Hotels, Taxis, Medical Care



Tomorrow:

Monitoring & Control:
Cars – Production - Buildings



“Smart Service Welt” The Research Program

Basic Facts: BMWi Funding Priority 2016-2018,
combining „Internet of Things“ + „Internet of Services“;

Call for Tenders (Nov. 2014 - April 2015)

50m € funding: 16 projects with 75 partners,

Main Application areas: Smart Production,
Smart Mobility and Smart Services for Everyday life
(health, home automation, water management).

More info: <http://smartservicewelt.de> (in German)



Smart Service Welt

The Challenges



acatech – German National Academy of Science and Engineering: „In the long run, good products will not be sufficient to stay competitive. **Smart Services** will fundamentally change the traditional business models of German economy and lead to a major paradigm shift.“ Acatech predicts:

- **New business models:**
 - Smart Products complemented by Services
 - Products will be sold “as a Service”.
- **New ecosystems:** Businesses must get ready to cooperate and to adapt their portfolios
- **New Platform businesses** will control the access to markets and customers! Services are decisive for user experience and success.



Smart Service Welt

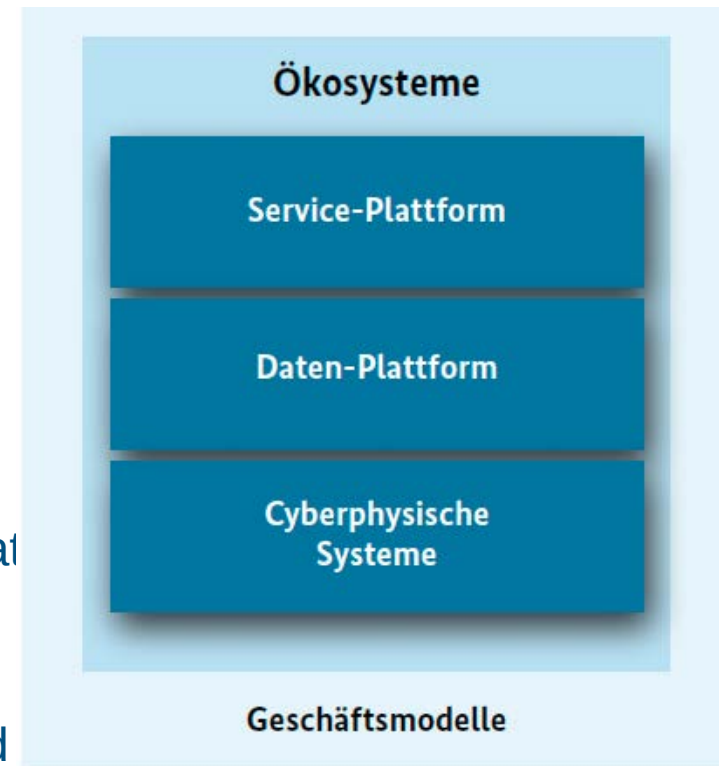
The Research Program



Develop reference applications to support the **digital transformation of the economy**

The concept combines three basic layers

- **Service platforms** that support innovative business models based on digital services
- **Data platforms** integrate, analyse and aggregate machine data to valuable information
- Data is generated by embedded and networked „**cyberphysical systems**“.



„Smart Service Welt“

Example 1: Service Factory



Objectives: Improve „Industry 4.0“ based Production and Logistics by using Sales data and Usage information

Expected Outcomes: A multi-level platform with open APIs that allows for broad SME cooperation

„Smart Service Welt“

Example 1: Service Factory



- Simple objects (→ adidas sports shoes) are equipped with sensors and become „**smart objects**“ that collect usage and environmental data.
- The collected **usage information** can potentially be used for the optimization of product development, the optimization of production and logistics processes as well as for new added value services.
- A modular and standardized platform architecture allows for a broad participation of technology providers and data users.

„Smart Service Welt“

Example 2: Smart Farming



Objectives: Create added value services according to the needs of the farmer, reach a high degree of work automatization.

Expected Outcomes: service platform that connects all kind of agricultural engines (producer-independant) and enables new business models in agriculture.

„Smart Service Welt“

Example 2: Smart Farming



- Multiple stationary and mobile sensors (e.g. farming engines) are combined via a service platform in the cloud.
- A **certification program** and **API standards** will assure a reliable and secure data exchange.
- Service orchestration will allow for a **ongoing data-driven process automation and information management** in the farming area. Customers (farmers) choose service bundles according to their specific needs and purposes.



Federal Ministry
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Projektpartner



„Smart Service Welt“

Example 3: MACSS



Objectives: Improve doctor-patient communication and treatment processes for patient with chronic diseases (dialysis patients, after kidney transplantation)

Expected Outcomes:

- Prototype of a patient centric **Health Service platform** that integrates and analyses data from multiple sources
- Core Services for patients, doctors and other stakeholders: data acquisition from multiple devices; **therapy plan monitoring** in real time; data from digital **patient diaries**; communication between practitioners and clinic physicians.



MyTherapy

Steigern Sie den Erfolg Ihrer Therapie. Aufgabe für Aufgabe.



„Smart Service Welt“

Example 3: MACSS



- a prototypical security / **authorization concept**; transparency for patients and doctors; the patient is the owner of the data
- Bidirectional communication in which relevant values (e.g. weight, blood sugar, blood pressure) are delivered continuously and **changes in health status are detected** (messenger, warning and notification functions)
- unified communication across the various existing professional systems
- A powerful central data platform (here: powered by SAP Hana)
- Testing the **concept of a data custodian** (Charité public clinic in Berlin)



MyTherapy

Steigern Sie den Erfolg Ihrer Therapie. Aufgabe für Aufgabe.



„Smart Service Welt“

Example 4: **CAR-BITS**.de

Objectives: Secure data processing in cars. Develop solutions for data protection measures in the automotive sector. Demonstrate how data that are collected by cars can be evaluated and used according to the law.

Expected Outcomes:

- A Prototype for associated project partners to **make use of data from cars**.
- 3 Pilot applications:
 - a) Detection and reporting of road damages;
 - b) detection and reporting of missing road markings;
 - c) detection and reporting of abnormal traffic signs.



„Smart Service Welt“

Example 4: **CAR-BITS**.de

- Overcome the principle of data **austerity** by preventing data abuse
- The prototype will be monitoring data protection compliance
- Privacy: Car drivers will be empowered for **informed consent** due to the design of the user interface.
- Additional service users are for example organisations for street maintenance and providers of high resolution maps.



„Smart Service Welt“

Example 5: Kommunal 4.0



Objectives: Make data the foundation of sustainable and efficient **planning and operation processes in municipal infrastructures.**

Expected Outcomes:

- Web applications that enable modern data acquisition, data aggregation and data analysis in **water management**
- Connect object data (e.g. stormwater tanks, pump stations, wastewater plants), environmental data and usage data (water consumption, event data)
- Test results from real project scenarios; cooperation with municipal suppliers/service organisations
- Business models from a technical and from a commercial perspective
- **Technical solutions for different legal frameworks**
(On premise, Cloud version)



Smart Service Welt

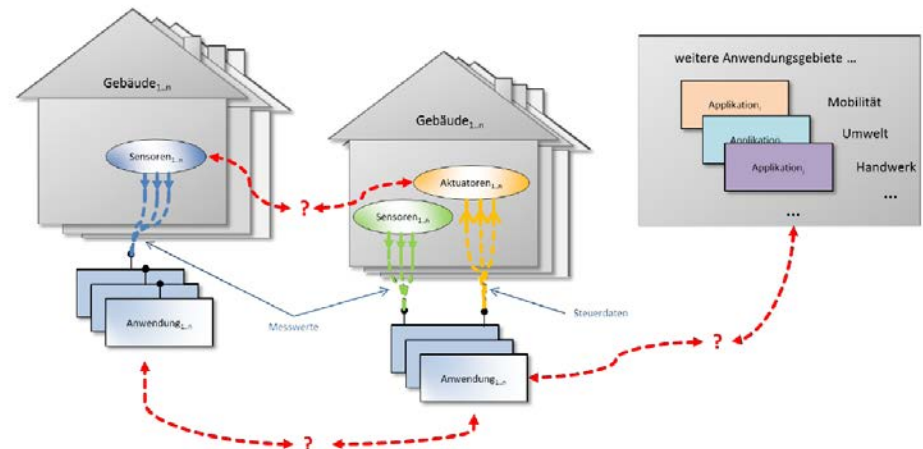
Example 6: Smart Orchestra



Objective: create an ecosystem that allows for the orchestration of so far isolated sensor data and applications based on common standards and Open Source Technologies (including the EU framework FIWARE).

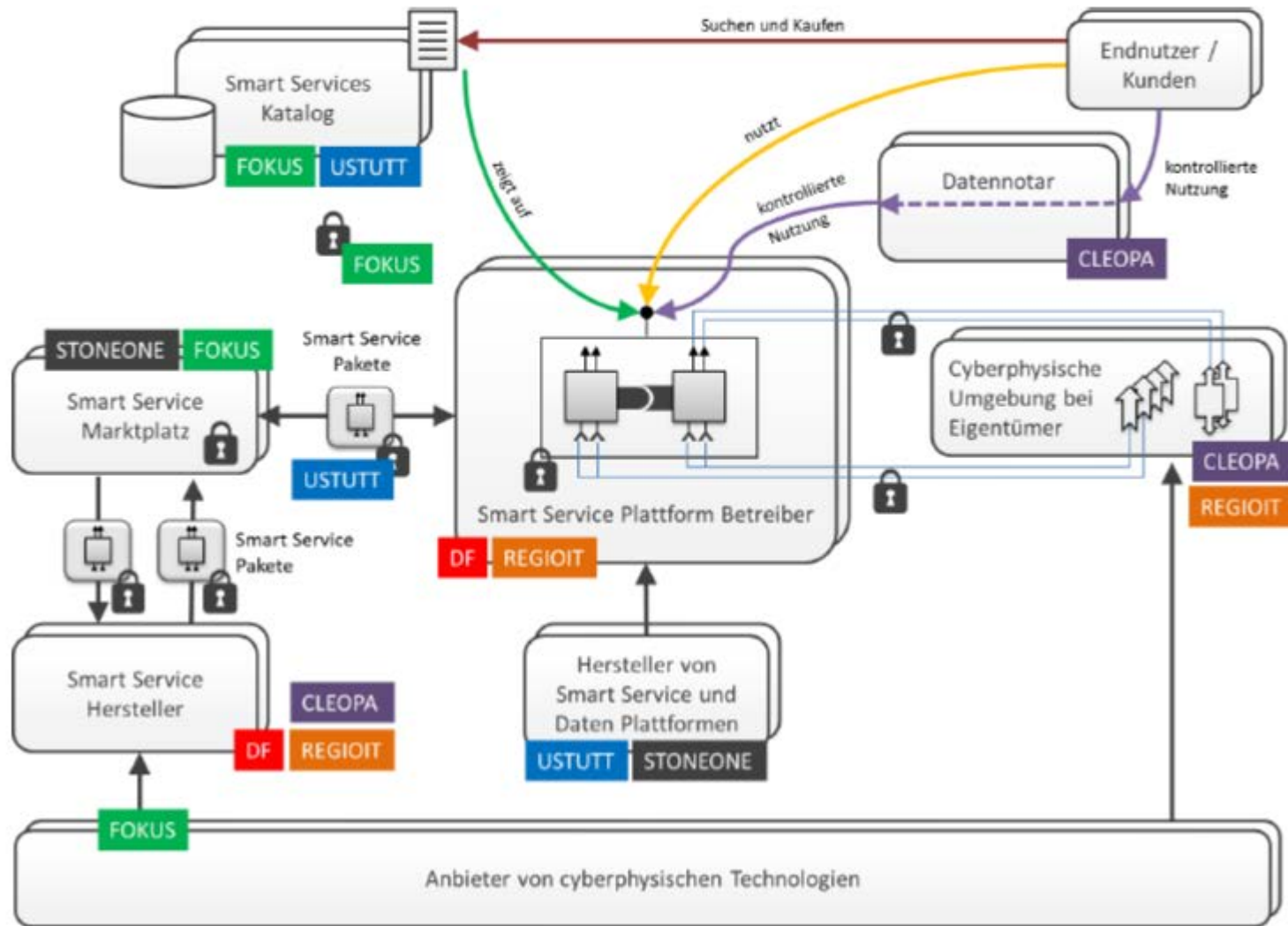
Expected Output:

- A cloud based OS platform for automated service execution
- An environment for service modeling and service description
- A Market place for service trading, formats for Packaging/distribution
- A security architecture including functionality for a data custodian
- Reference implementation (building automation)



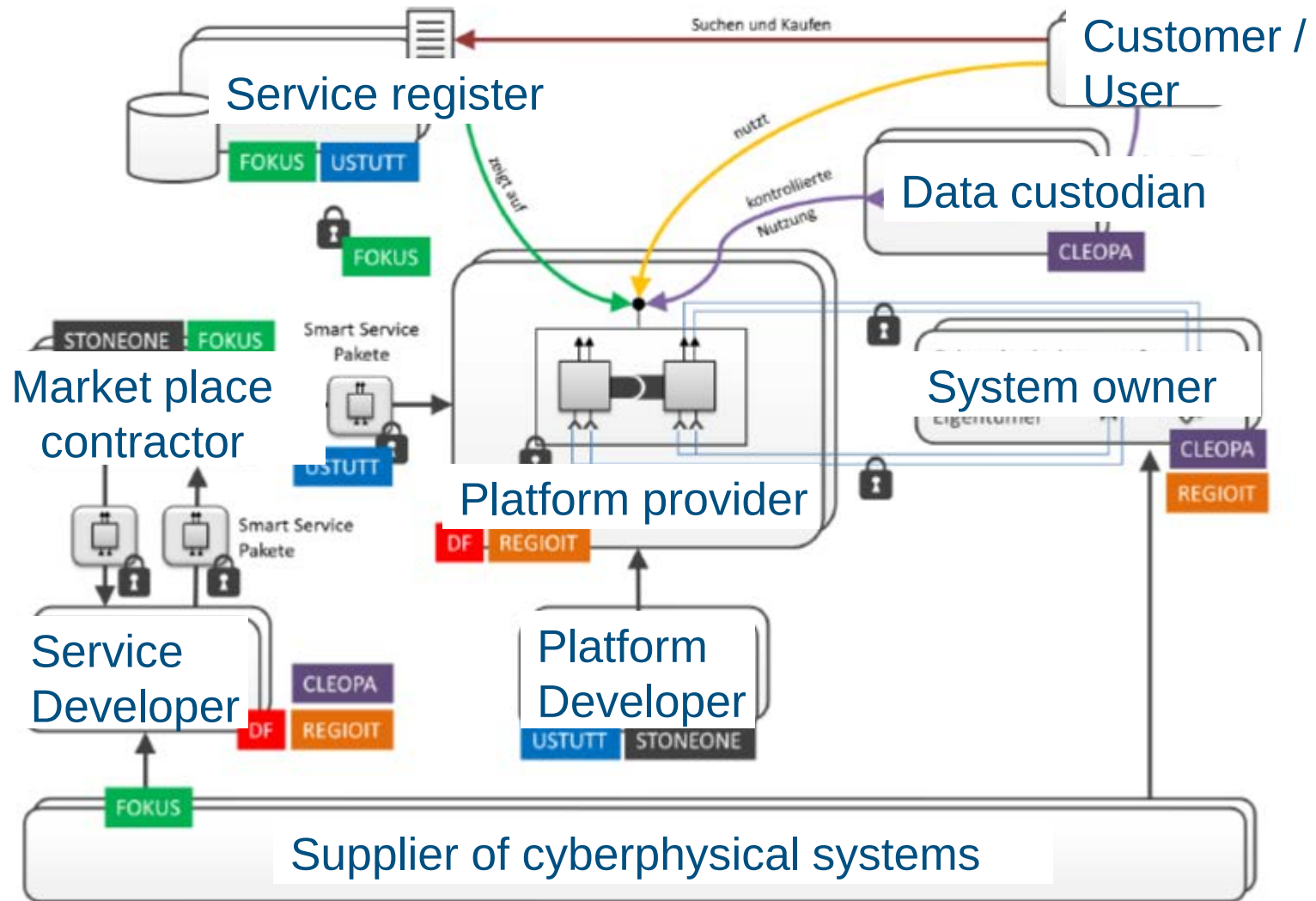
Smart Service Welt

Example 6: Smart Orchestra

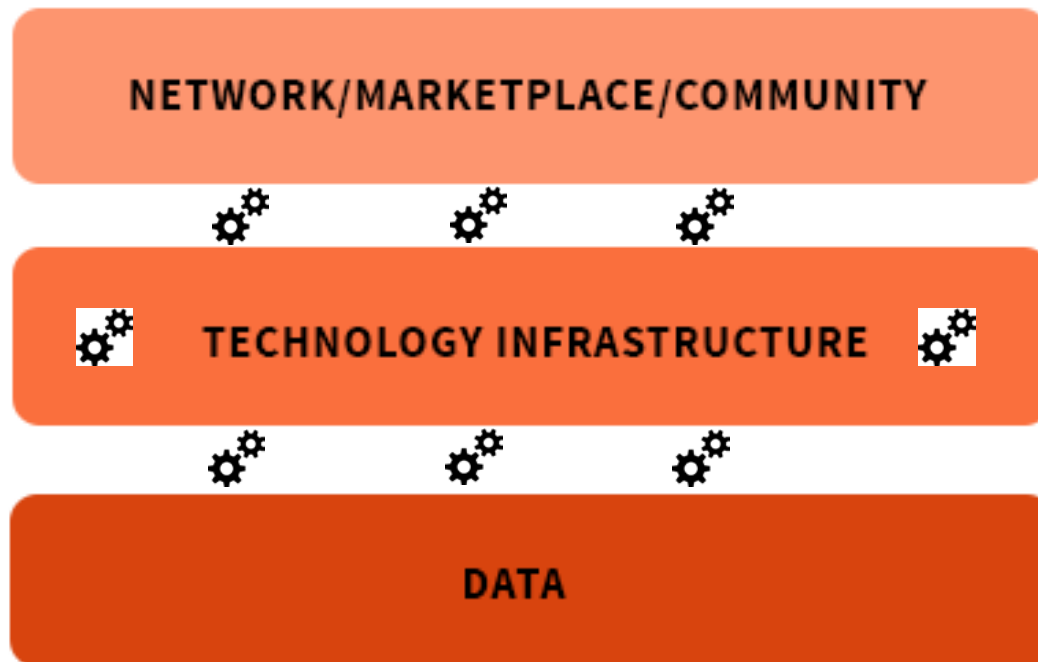


Smart Service Welt

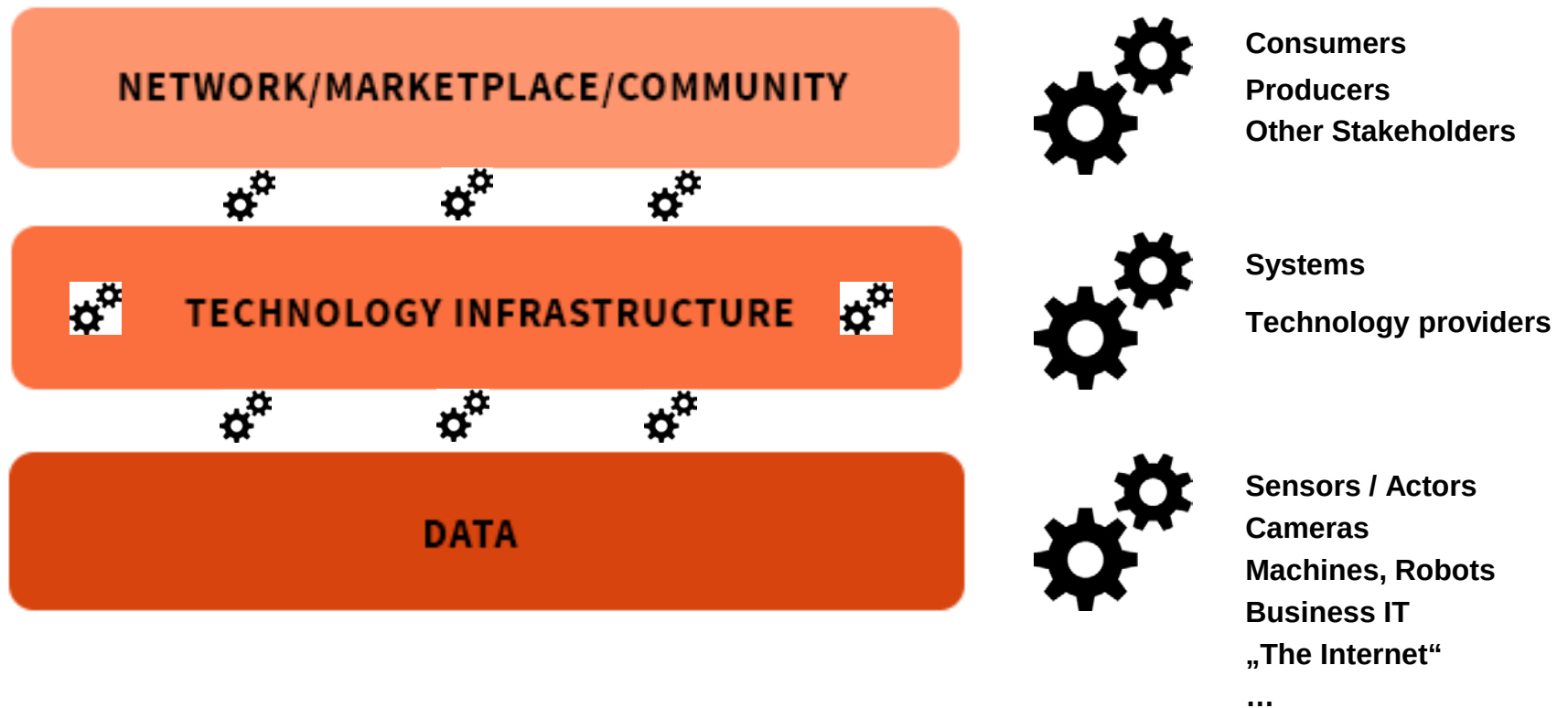
Example 6: Smart Orchestra



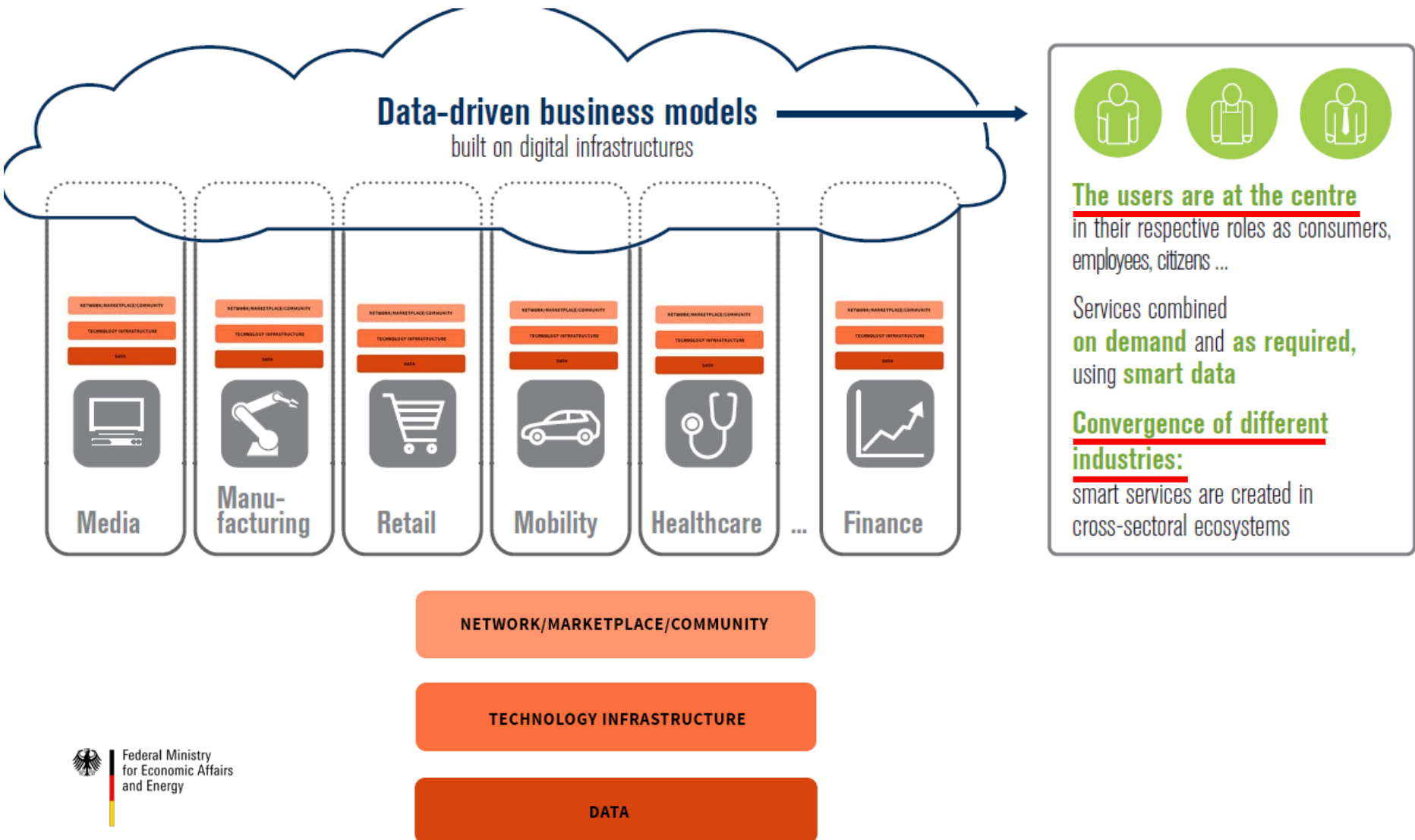
Smart Services plus Digital infrastructures
will enable data driven business models.



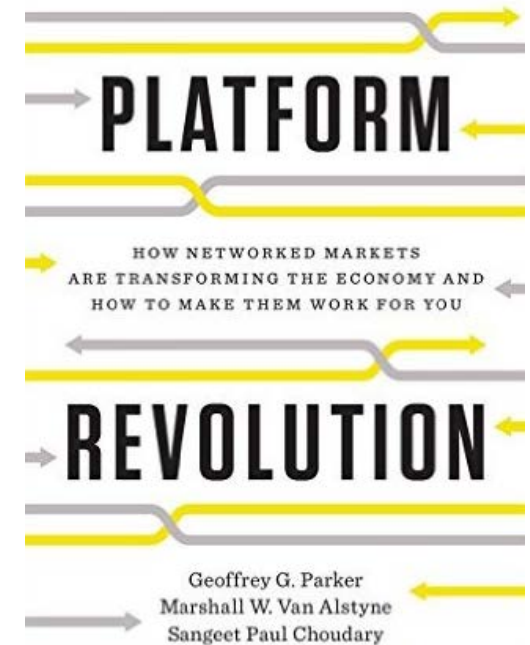
Smart Services plus Digital infrastructures will enable data driven business models.



Smart Services plus Digital infrastructures will enable data driven business models.



The Smart Service / Platform Economy is a challenge for the European competitiveness



People matter, results count.



The rise of digital platforms

81%



of executives say
platform-based
business models
will be core to their
growth strategy
within three years

The Future of Jobs

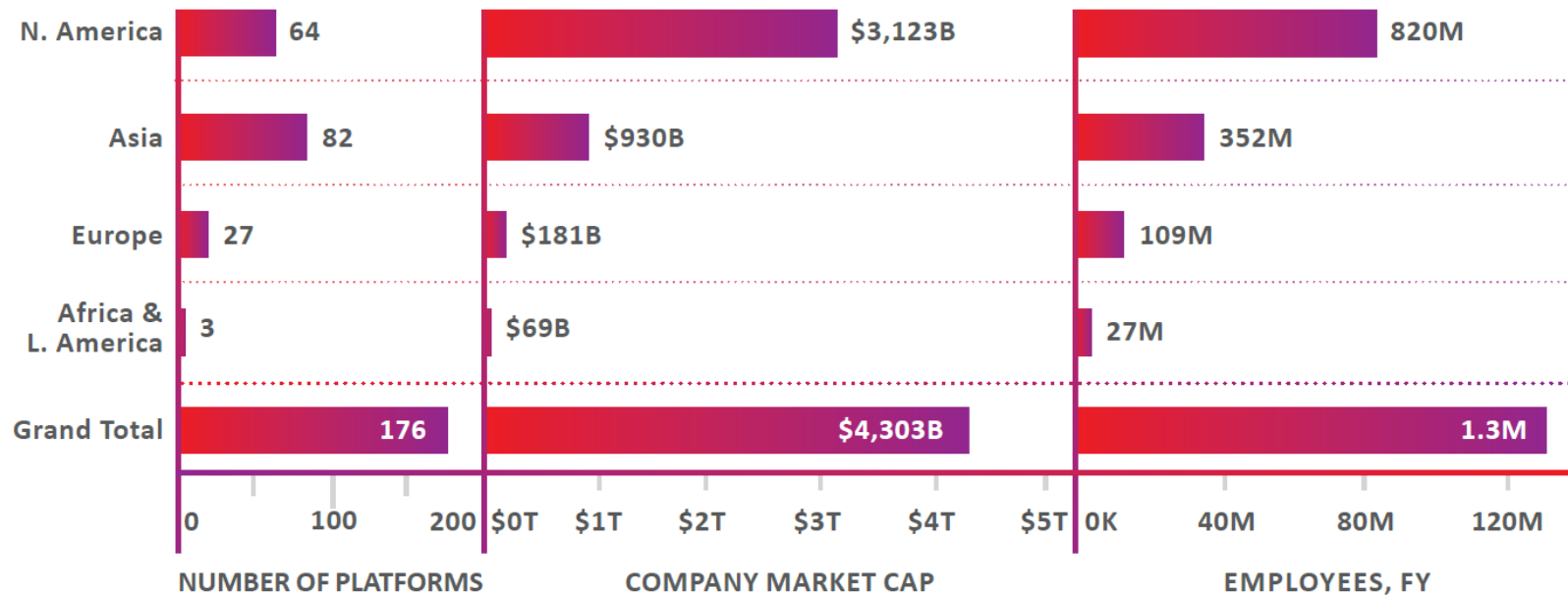
Employment, Skills and
Workforce Strategy for the
Fourth Industrial Revolution

Figure 6: Net employment outlook by job family, 2015–2020
Employees (thousands, all focus countries)



The Smart Service / Platform Economy is a challenge for the European competitiveness

PLATFORM COMPANIES BY REGION



Only 27 or 15 percent of the platforms come from Europe and collectively they represent a little over 4 percent by market value.

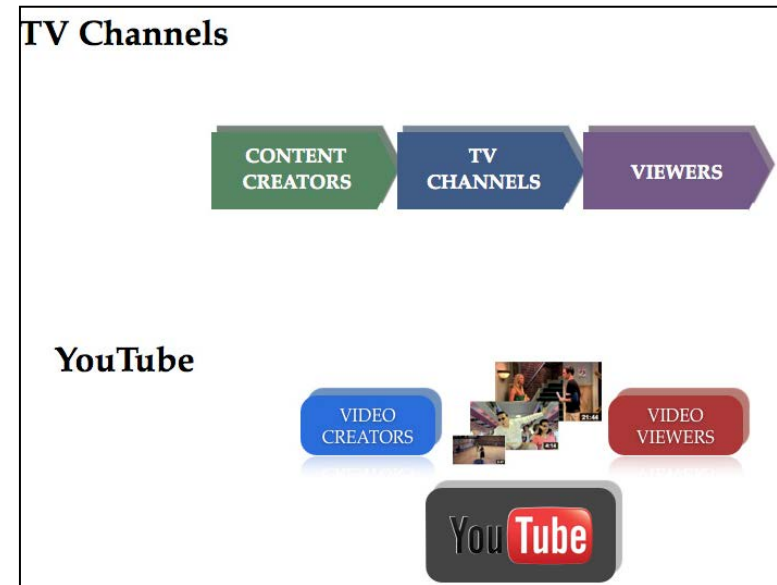
→ For many traditional companies this is still virgin soil (Neuland)

Service Platforms are not (just) about technology

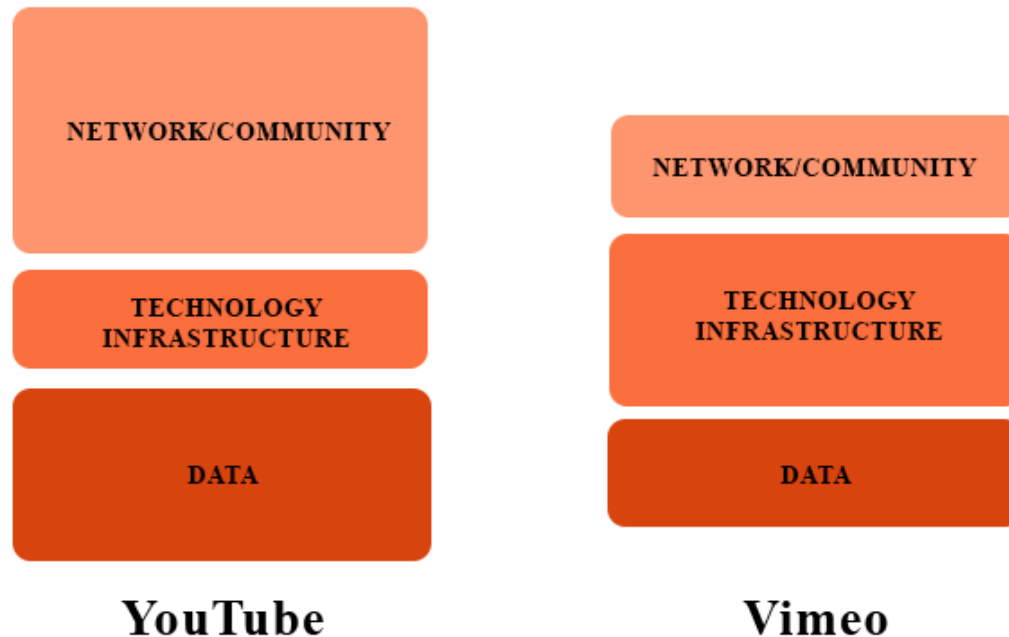
Business models: from linear business models (“pipes”) to networks: The consumer is not the customer, multiple customers, consumers & producers

Plug and play: from “knights castles” to low entry barriers (openness, interoperability, developer support)

Interaction is key: The core role of the platform business is to enable interactions between the participants that connect to the platform. Governance should encourage participants to create and exchange value.



Service Platforms are not (just) about technology



- A Growing Data foundation
- + A Growing Community
- + Keep the infrastructure performant (includes safety & availability)

Service Platforms are not (just) about technology

FLICKR VS. FACEBOOK PHOTOS

Who is creating value? Who pays for it ?

How to create incentives that repeatedly pull participants to the platform ?

Performant ? Robust? Safe ?

How to access new data providers / sources ?

What is customer relevant content / service ?

On premise / in the cloud ?

COMMUNITY

TECHNOLOGY
INFRASTRUCTURE

DATA

COMMUNITY

TECHNOLOGY
INFRASTRUCTURE

DATA

Flickr

Facebook Photos

Service Platforms are not (just) about technology

— VALUE —

*The units added on top of the platform
represent inventory.*

*These units are the **units of value**, and
scale the value created on the platform.*

*The platform provides the
infrastructure and tools on which
others can build or add value.*

*The platform, often, has little or no
value of its own. It needs units of value.*

— PLATFORM —



Service Platforms are not (just) about technology

— VALUE —

*The units added on top of the platform
represent inventory.*

*These units are the **units of value**, and
scale the value created on the platform.*

My notes:

Services must meet Demands / Needs

Service Quality / User Experience

Automation degree / cost reduction

Time and effort, feeling safe

*The platform provides the
infrastructure and tools on which
others can build or add value.*

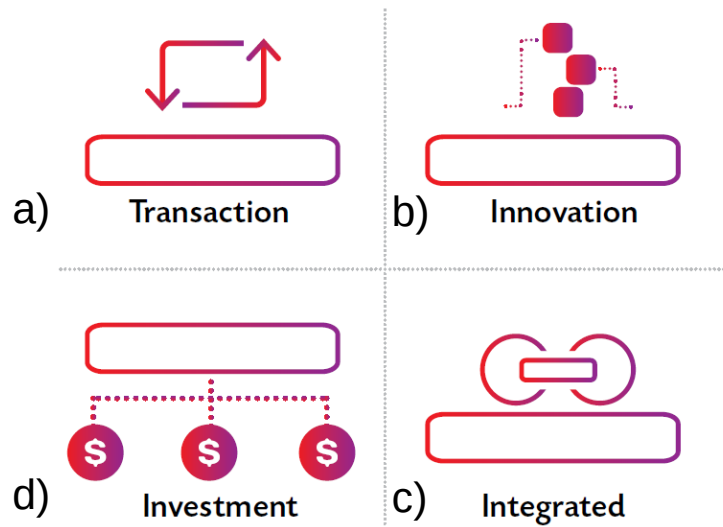
*The platform, often, has little or no
value of its own. It needs units of value.*

— PLATFORM —

Service Platforms are not (just) about technology

PLATFORM TYPES

(Source: Evans / Gawer: Rise of the Platform Enterprise, 2015)



Key Functions

- Matching
- Interaction
- Complements
- Ecosystem

Source:
Parker, Van Alstyne, Choudary, 2015

There is a variety of platform types:

- a) Some facilitate information / goods exchange between users, buyers, suppliers (amazon, FB)
- b) Some facilitate to develop complementary products/services (Salesforce, General Electric, Bosch,)
- c) Some facilitate both (Apple app store)
- d) Some are basically an investment strategy

→ There is a variety of business models. Which one works?

Conclusion

Take Home Messages



- Smart Service Technologies are becoming the foundation of more and more economic fields and branches a) additional business with product related services b) new business models: service instead of products; c) new services
- In relevant areas such as machinery, car production, biochemistry, farming. Not only in production („Industrie 4.0“) but in all kind of societal activities
- Europe is threatened to lose market leadership in these areas if the enterprises miss out to invest in OWN service and platform technologies and to develop their OWN service and platform strategy. Amazon & Uber are only a beginning!
- European enterprises have great chances to strengthen their market position if they understand and use the mechanisms of service & platform economy. While digital infrastructures are an important prerequisite; making use of data sources and building the community are further key elements.



DLR Projektträger

Thank you for your attention.

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