VON DER VISION ZUR WIRKLICHKEIT – PLATTFORMEN UND LÖSUNGEN FÜR DAS INTERNET DER DINGE

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CEO Bosch Software Innovations GmbH

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Bosch Group: Technology to enhance quality of life
Four business sectors

Mobility Solutions

Industrial Technology

Energy and Building Technology

Consumer Goods

Bosch Software Innovations –
IoT software and systems house

> 750 IoT experts in 9 international locations

276
manufacturing sites

390,000
associates incl. 59,000 in R&D

€73.1 billion
in sales

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THE INTERNET OF THINGS: FUNDAMENTAL CHANGES IN OUR BUSINESS

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The Internet of Things
We are living in a highly connected world ...

of 5.7 billion people...
... 0.7% are online

1995

of 6.5 billion people...
... 15% are online

2005

of **7.3 billion** people...
... **75%** are online

2015

● World population ● People with internet access
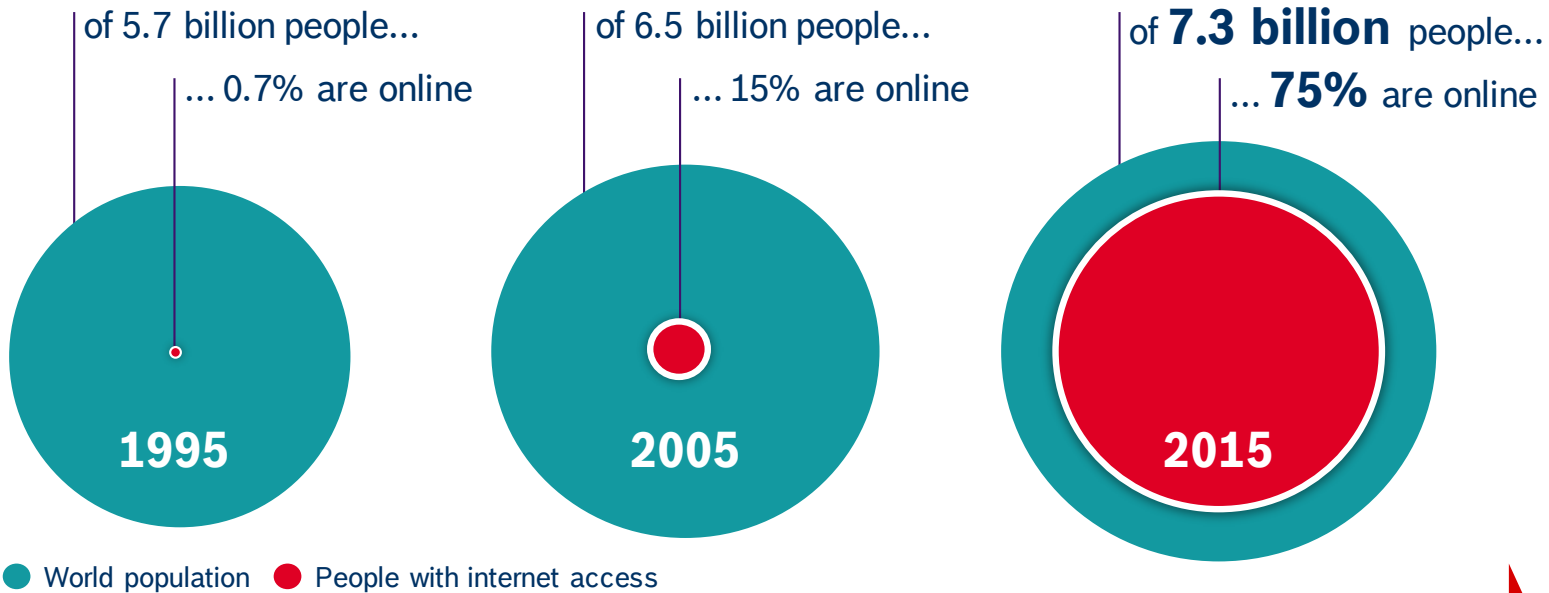
Connected devices

0.04 billion

0.75 billion

> 6.6 billion

Web 1.0 "Classic Web"
connecting enterprises/ organisations with people, rather static
- Homepages
- E-Commerce ≈1990

Web 2.0 "Social Web"
interconnecting also people, dynamic interaction between common users
- Blogs, Social Communities
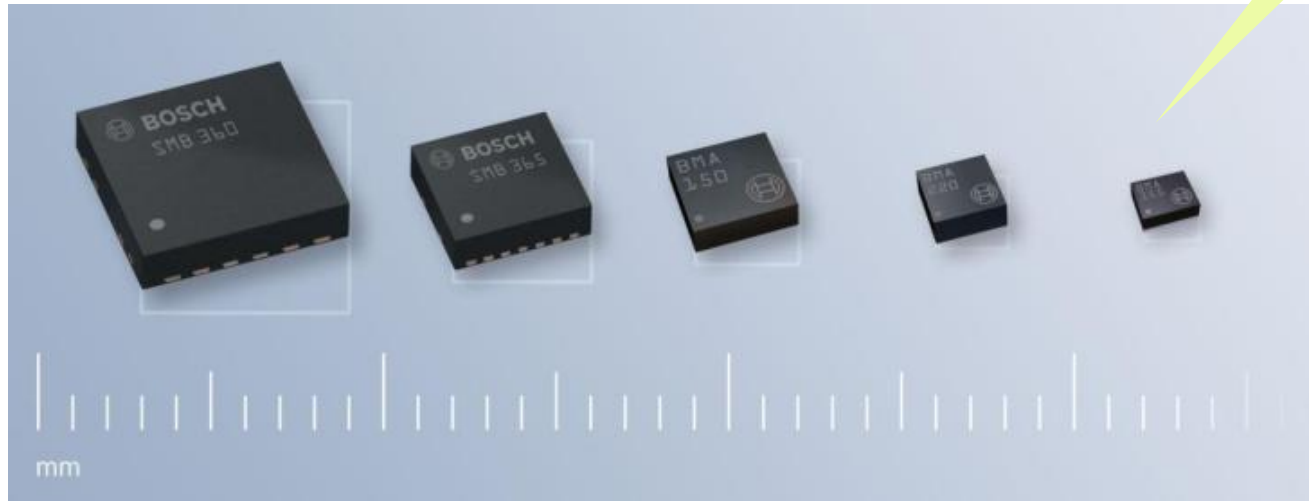- Platforms like Facebook, Twitter, YouTube... ≈ 2005

Web 3.0/4.0 "Internet of Things"
interconnecting also objects of everyday use to create
- Industry 4.0
- Connected Mobility
- Smart Home ...

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The Internet of Things
Enabler: miniaturized, low power sensors

Continuously
- shrinking size / footprint
- reducing power consumption

▶ "Moore's Law" in MEMS*:

*MEMS: Micro electro-mechanical systems
Source: Bosch Sensortech, www.bosch-sensortec.com

Bosch – world's leading manufacturer

▶ Producing sensors on industrial scale since 1995

▶ Six billion MEMS sensors produced

▶ 100% in-house from MEMS design to manufacturing

Bosch Sensortec 1st
with 3x3 mm^2

Bosch Sensortec 1st
with 1.2 x 1.5 mm^2

2005   2006   2007   2010   2013

Bosch Sensortec 1st
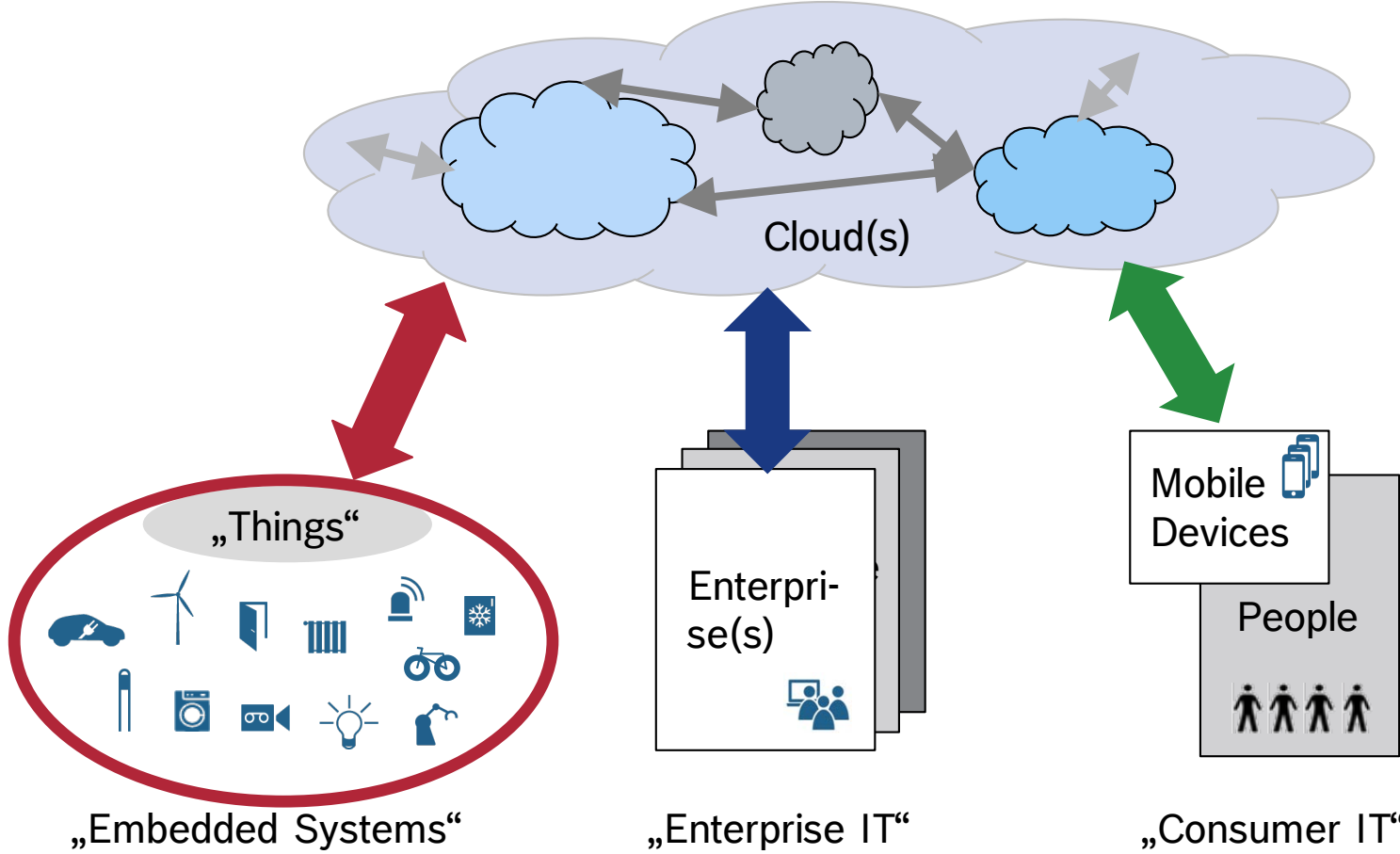with 2x2 mm^2

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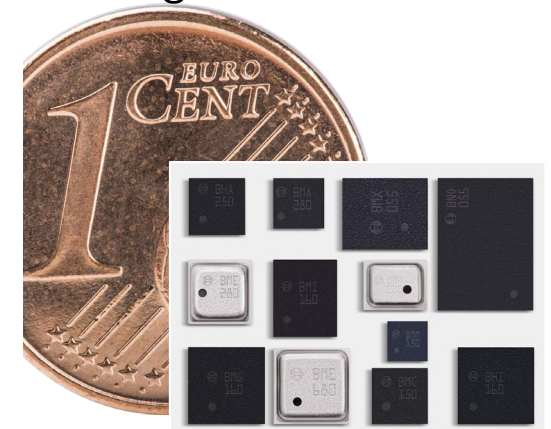
Our vision for the Internet of Things: The Connected World

Industry

Mobility

Energy

Smart Home

Smart City

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The Internet of Things
Bridges between different worlds required

Cloud(s)

"Things"

Enterpri-se(s)

Mobile Devices

People

"Embedded Systems"

"Enterprise IT"

"Consumer IT"

Not only a technical task:

different business models, cultures and paradigms must be brought together

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The Internet of Things
Fundamental changes in our business

Thing **+** Connectivity [HW | SW] **=** Thing-based **FUNCTION** [Physical | Local] **+** Digital **SERVICE** [Digital | Global]
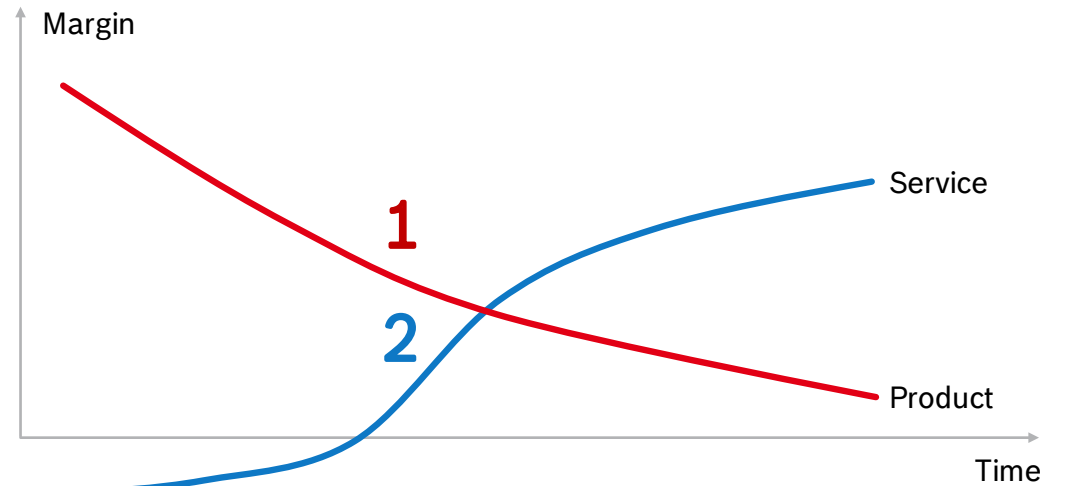
1 Complement and strengthen traditional hardware product business

Higher margins and differentiation through product-related services

2 Grow with potentially disruptive business models
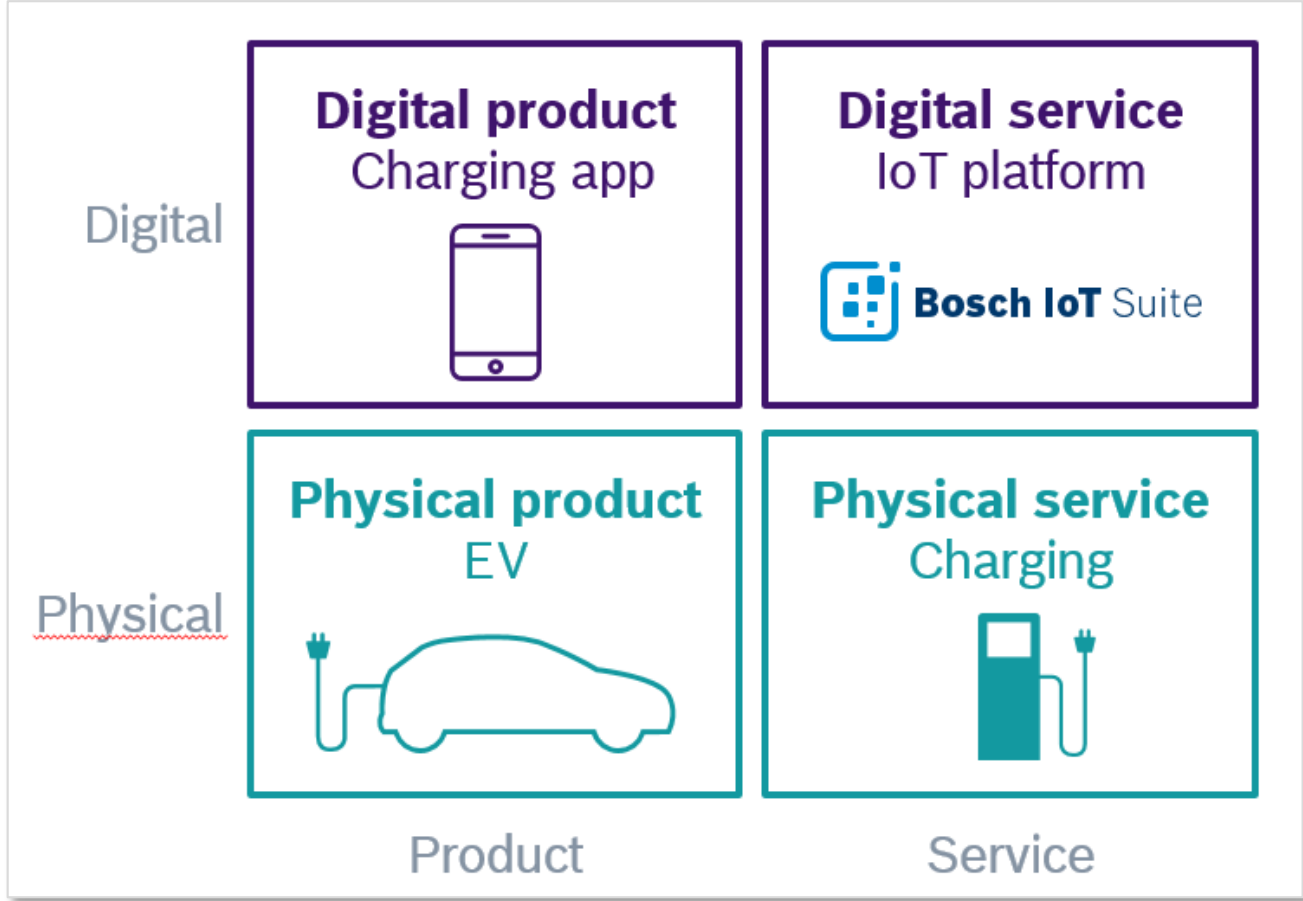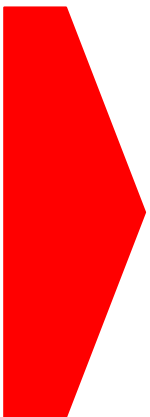
Will everything become a service?

Prof. Elgar Fleisch, 2010

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The Internet of Things
From Physical Products to Digital Services: Mobility

Example: EV Charging

Digital product
Charging app

Digital service
IoT platform

Bosch IoT Suite

Physical product
EV

Physical service
Charging

Digital

Physical

Product
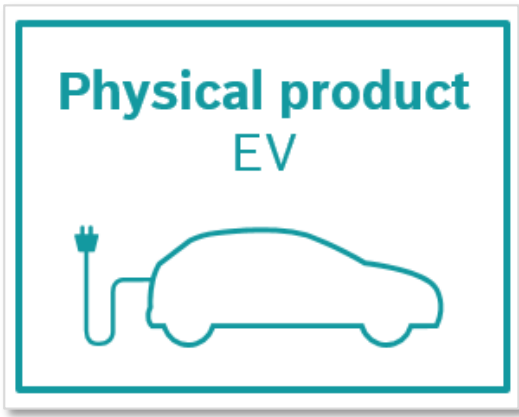
Service

Hybrid Product Scheme: Prof. Elgar Fleisch, 2016

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HOW DO WE PREPARE AT BOSCH ?

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Bosch is active on 3 layers of the IoT
Bosch IoT Suite connecting all industries

Bosch IoT Cloud

Services & applications

Middleware platform

Bosch IoT Suite

Smart things

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Bosch IoT Suite
Toolbox in the cloud for IoT developers

Bosch IoT Analytics

Bosch IoT Hub

Bosch IoT Permissions

Bosch IoT Remote Manager

Bosch IoT Rollouts

Bosch IoT Things
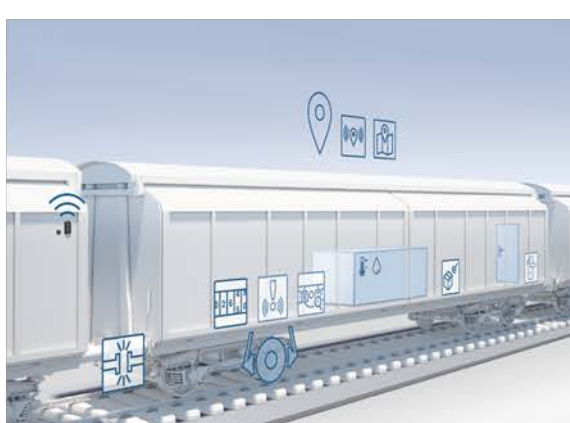
Software services available on developer marketplace

Successfully commercialize prototype applications

My IoT idea
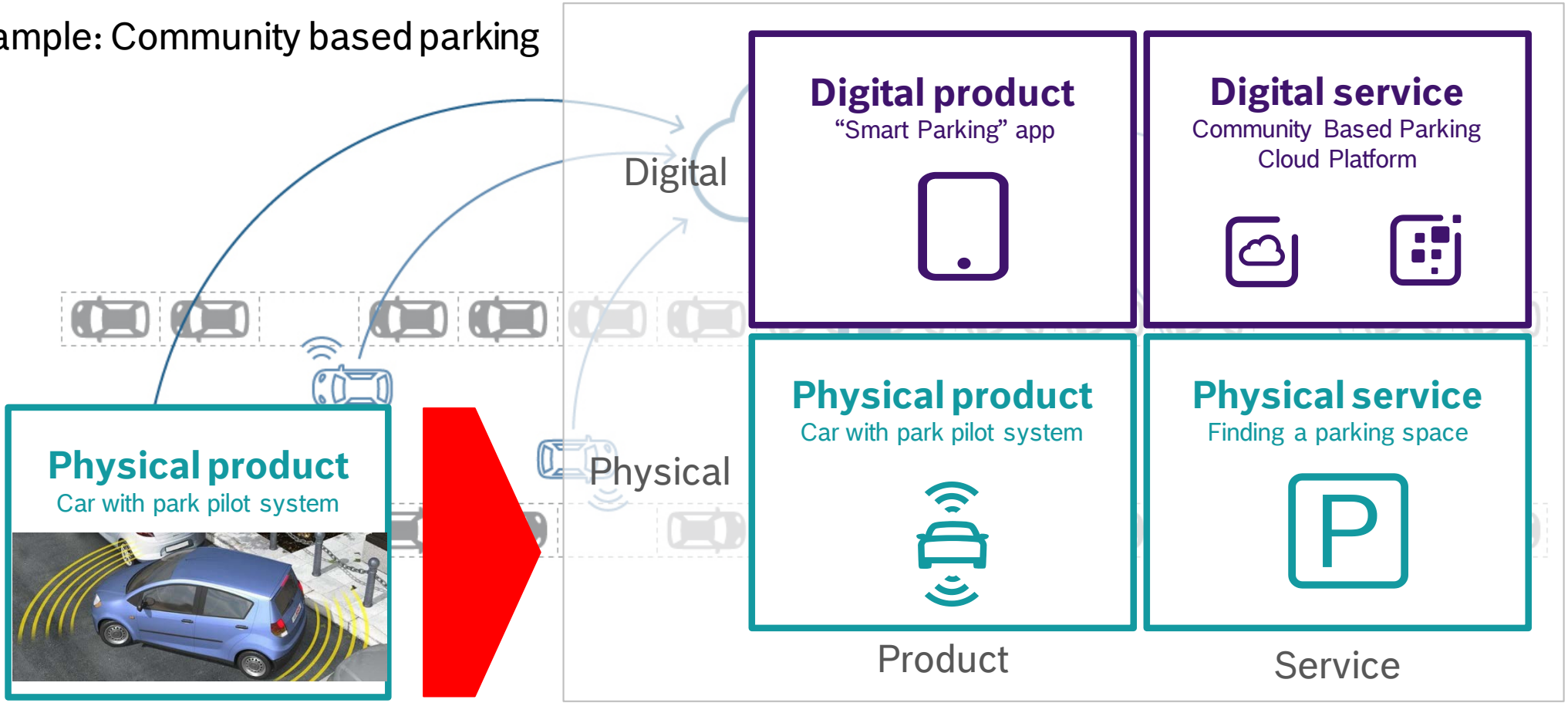
Bosch in the Internet of Things
Innovative cloud-based solutions across all domains

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The Internet of Things
From Physical Products to Digital Services: Mobility

Example: Community based parking

Digital product
"Smart Parking" app

Digital service
Community Based Parking Cloud Platform

Physical product
Car with park pilot system

Physical service
Finding a parking space

Physical product
Car with park pilot system

Digital

Physical

Product

Service

Hybrid Product Scheme: Prof. Elgar Fleisch, 2016

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The Internet of Things
From Physical Products to Digital Services: Smart Heating

Example: Junkers Gas Boiler

Digital product
"HomeCom" app

Digital service
Web-based control

Physical product
Smart Gas Boiler

Physical service
Hot Water & Warm Air

Digital

Physical

Product

Service

Physical product
Gas Boiler (100 years ago)
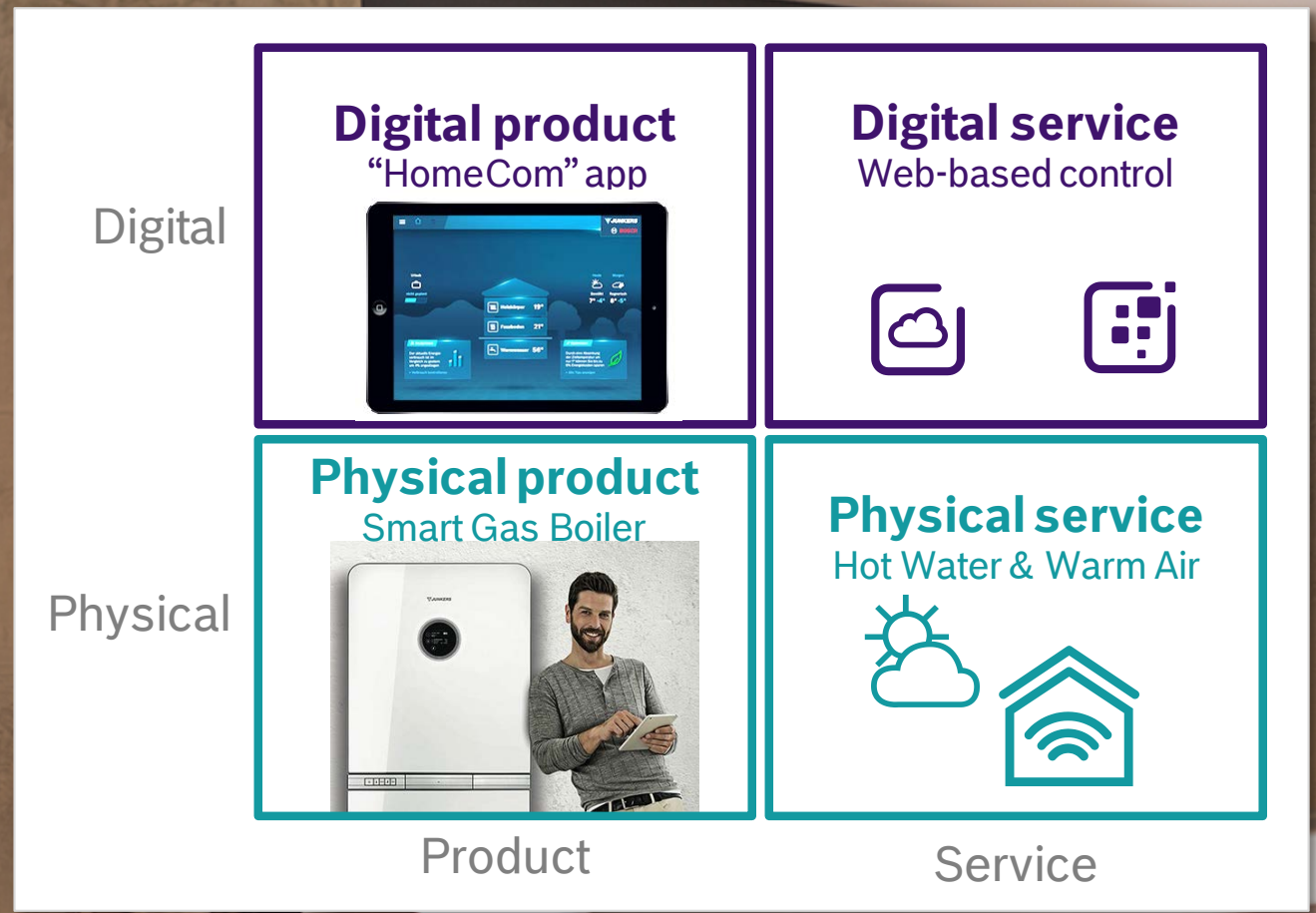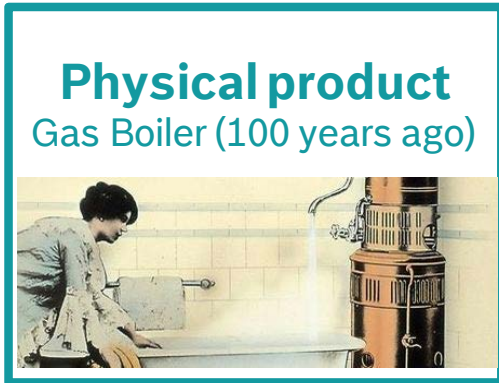
Hybrid Product Scheme: Prof. Elgar Fleisch, 2016

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The Internet of Things
From Physical Products to Digital Services: Powertools

Example: "Track my Tools"

Digital product
"Track my tools" app

Digital service
Inventory Management

Digital

Physical product
Electric Drill

Physical product
Electric Drill + module
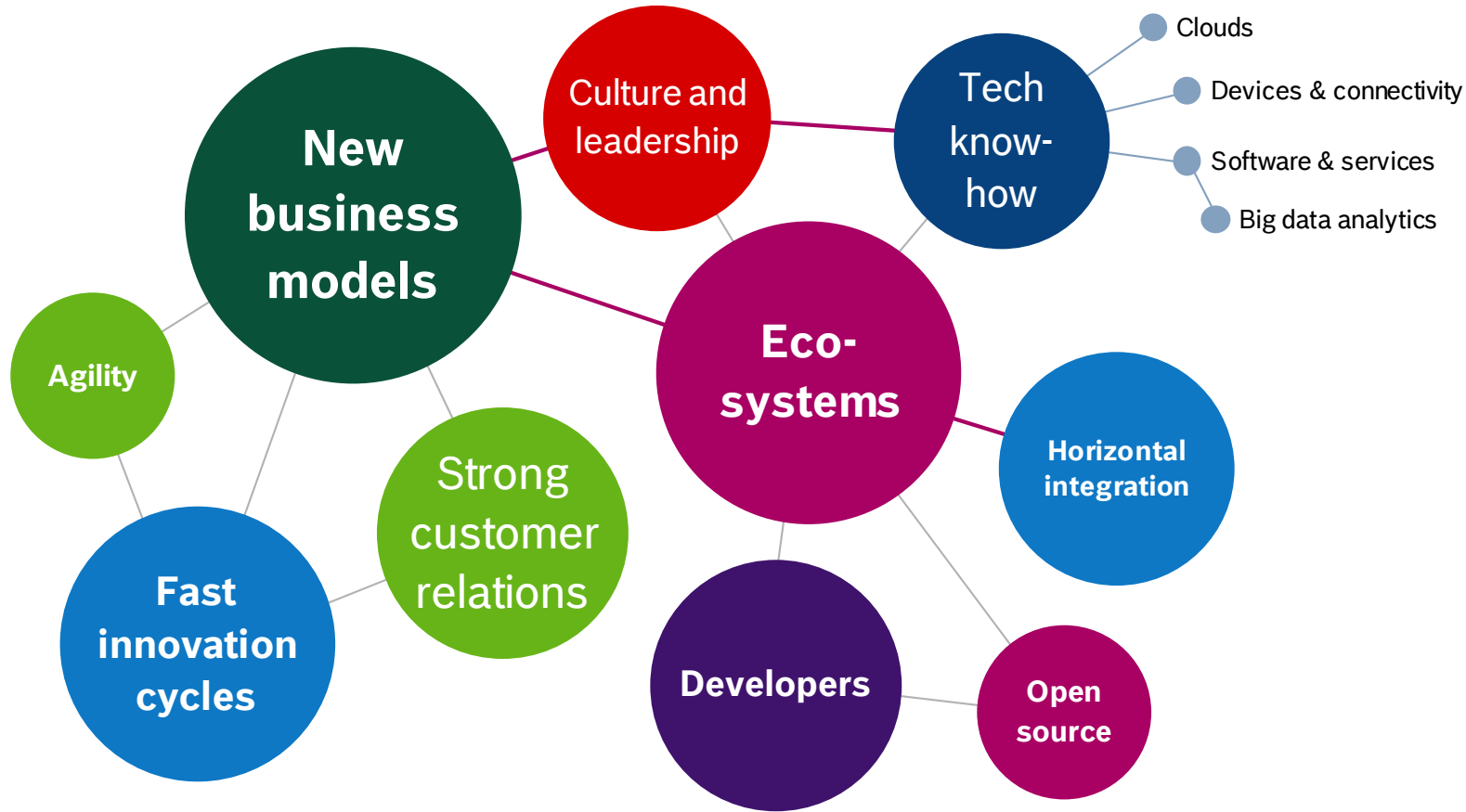
Physical service
"Drilling a hole"

Physical

Product

Service

Hybrid Product Scheme: Prof. Elgar Fleisch, 2016

The Internet of Things
Success factors in a networked economy

Open IoT ecosystems are key to success:

▶ Connected world requires cross-domain integration
  − open standards
▶ Technology
  − Multi-layer protocol interoperability
  − Standardized interfaces and APIs
  − Open source
▶ Marketplaces, clouds, platforms
▶ Strategic alliances

Diagram labels:
- New business models
- Culture and leadership
- Tech know-how
  - Clouds
  - Devices & connectivity
  - Software & services
  - Big data analytics
- Eco-systems
- Agility
- Strong customer relations
- Horizontal integration
- Fast innovation cycles
- Developers
- Open source

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Bosch Software Innovations
Agile Leadership & People are Key for Success

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THANK YOU

Find more on:

www.bosch-si.com

www.bosch.com

www.bosch-smarthome.com

www.iot-lab.ch

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