Industrie 4.0 – A Chance for the Swiss Industry

Robert Rudolph
Member of the Board Swissmem / President Industrie 2025

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Agenda

- Understanding of Industrie 4.0
- Examples / Use Cases
- Status in Switzerland
- Engagement of Companies

History of «Industrie 4.0»

2012

January: Working Committee «Industrie 4.0» (acatech)

April: First presentation on «Industrie 4.0» @ HMI

2013

April: Presentation of final report of WC to Chancellor Merkel @ HMI, Launch of «Zukunftsprojekt Industrie 4.0»

June: Start of Plattform Industrie 4.0, Start of working groups, lead by VDMA, BITKOM and ZVEI

2014

Industrie 4.0 is main topic @ CeBIT and HMI

2015

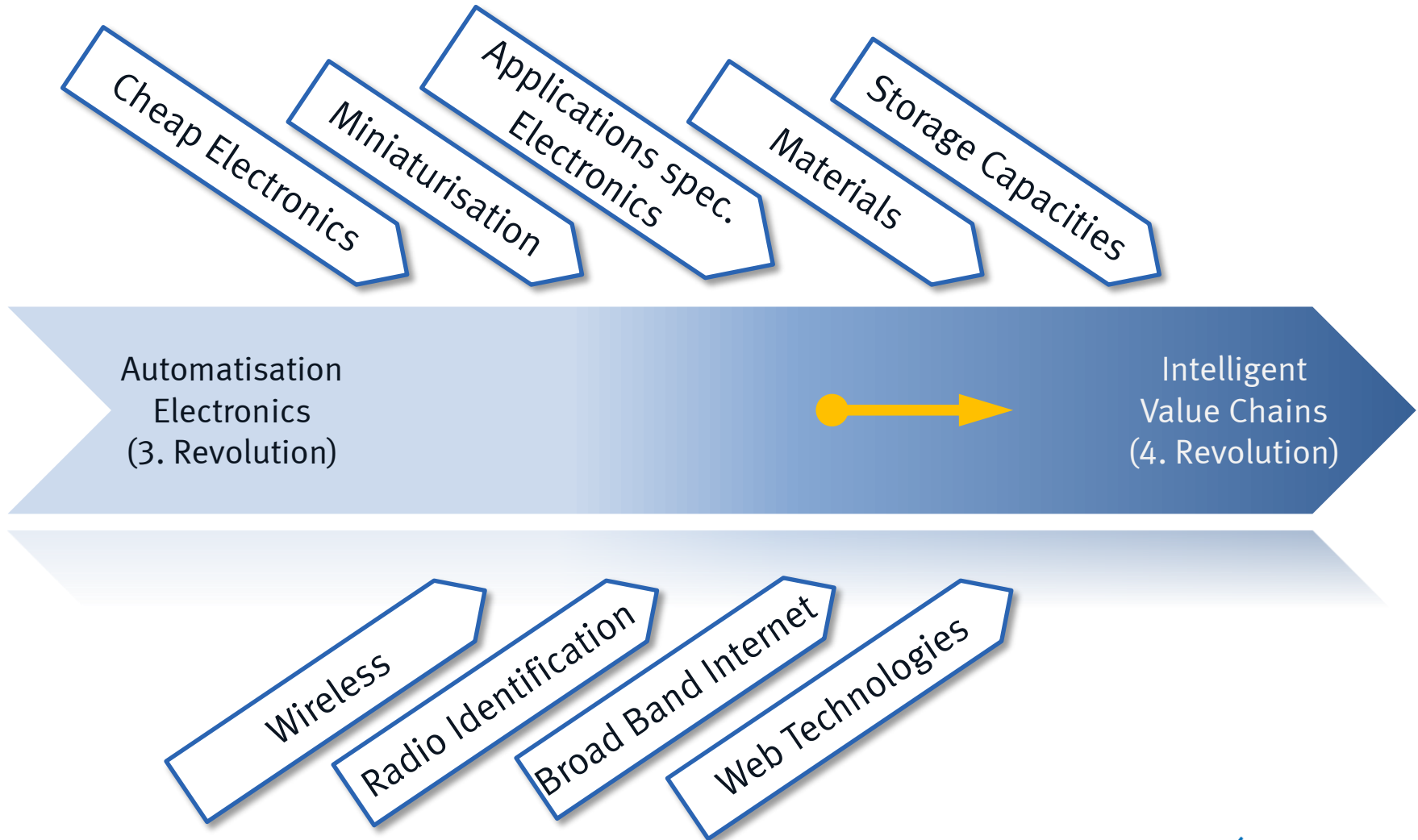@ HMI BMWi (Gabriel) and BMBF (Wanka) take over leadership of Plattform Industrie 4.0

2016

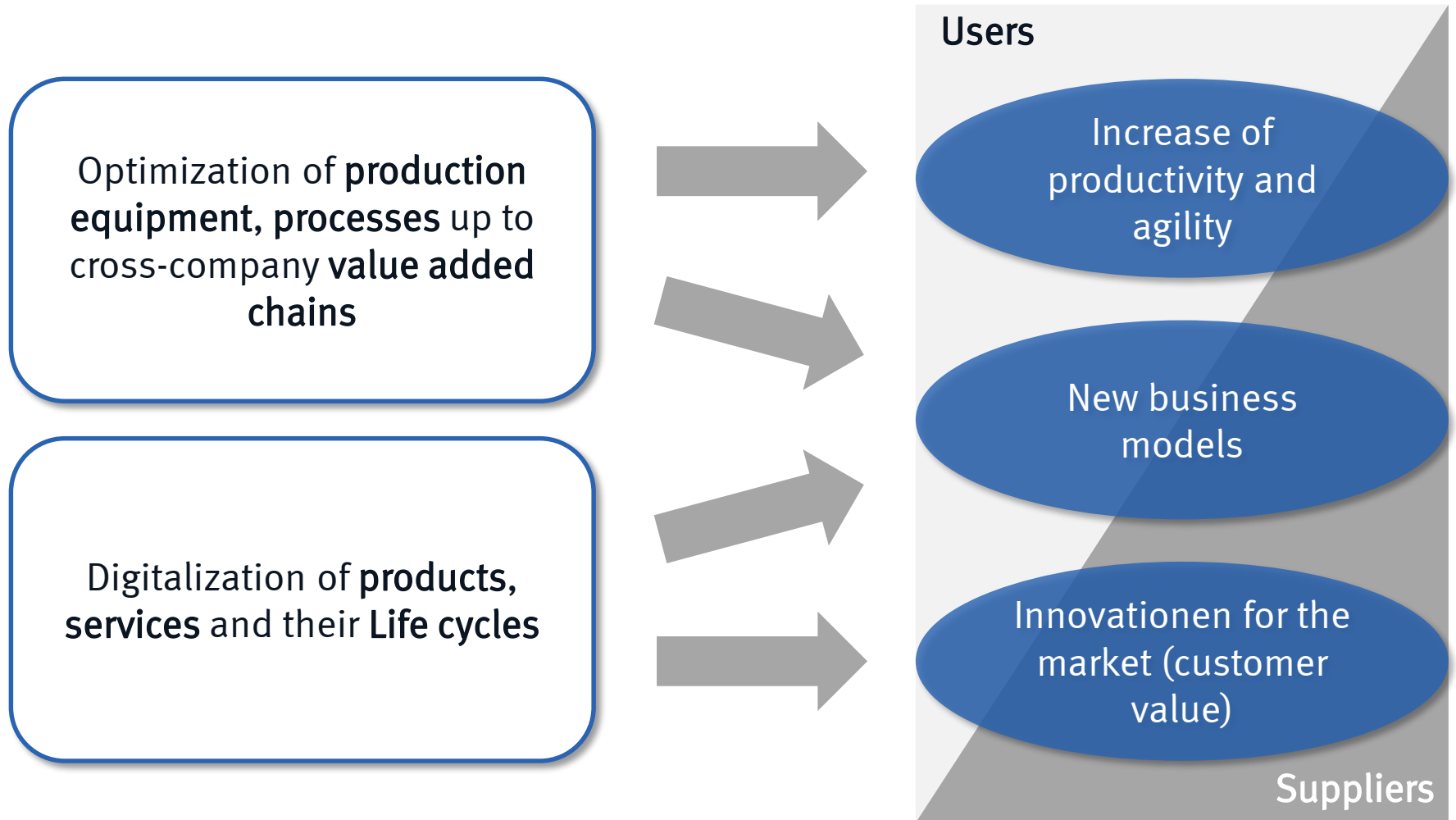VDMA-Forum Industrie 4.0: Pathway to networked production

International Activities

- Germany: Plattform Industrie 4.0
- Switzerland: Industrie 2025
- Netherlands: Smart Industry
- Schweden: Produktion 2030
- France: Alliance Usine du Futur
- USA: Industrial Internet Consortia (IIC)
- China: 物联网 (wù lián wǎng)
- Austria: Industrie 4.0 Österreich
- Europäische Union: Digitising European Industry (DSM)

Digital Transition in Industry

Cheap Electronics

Miniaturisation

Applications spec. Electronics

Materials

Storage Capacities

Automatisation Electronics (3. Revolution)

Intelligent Value Chains (4. Revolution)

Wireless

Radio Identification

Broad Band Internet

Web Technologies

Basic Understanding

Optimization of **production equipment, processes** up to cross-company **value added chains**

Digitalization of **products, services** and their **Life cycles**

Users

Increase of productivity and agility

New business models

Innovationen for the market (customer value)

Suppliers

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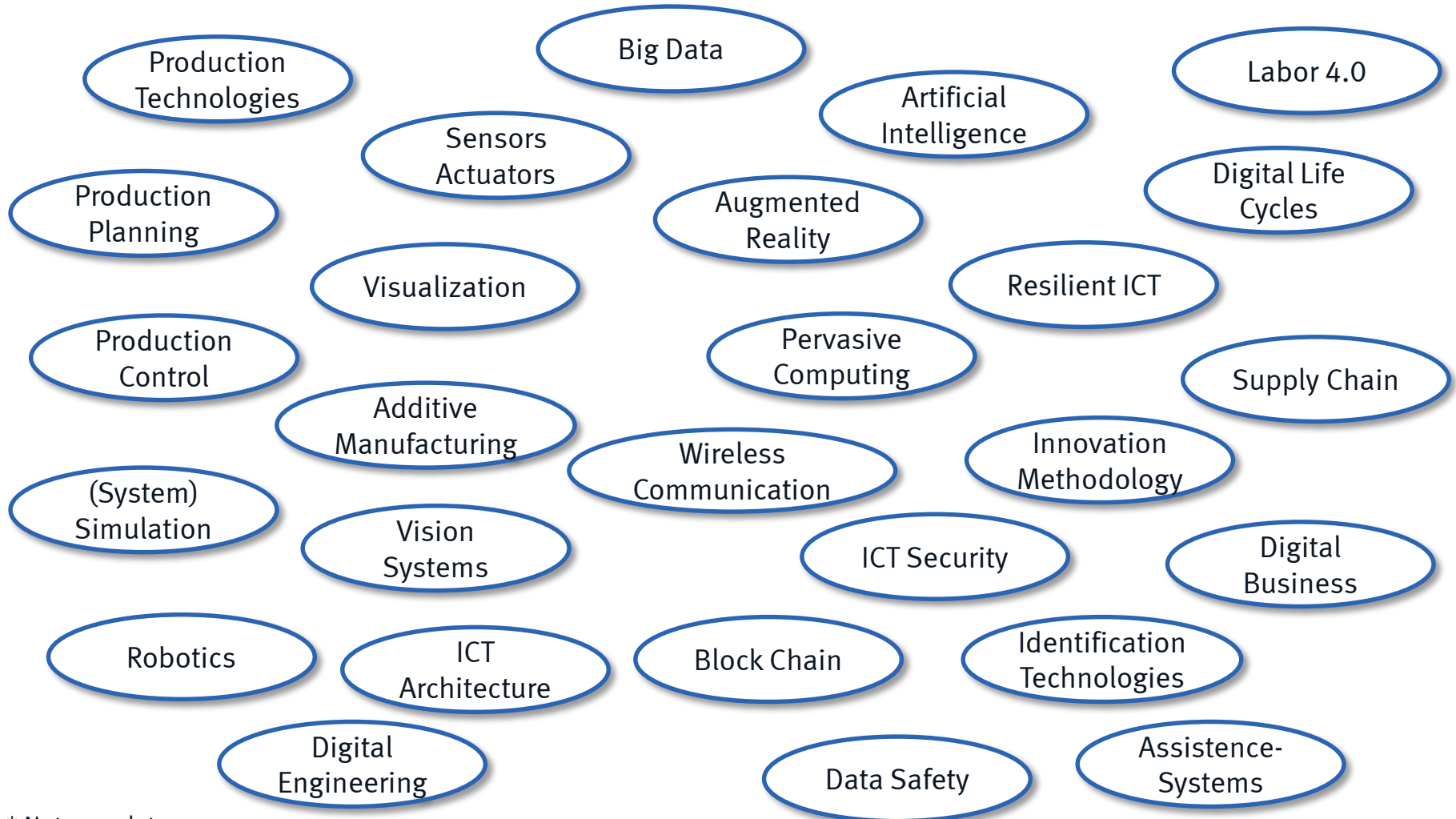
Opportunities for «Use Cases»
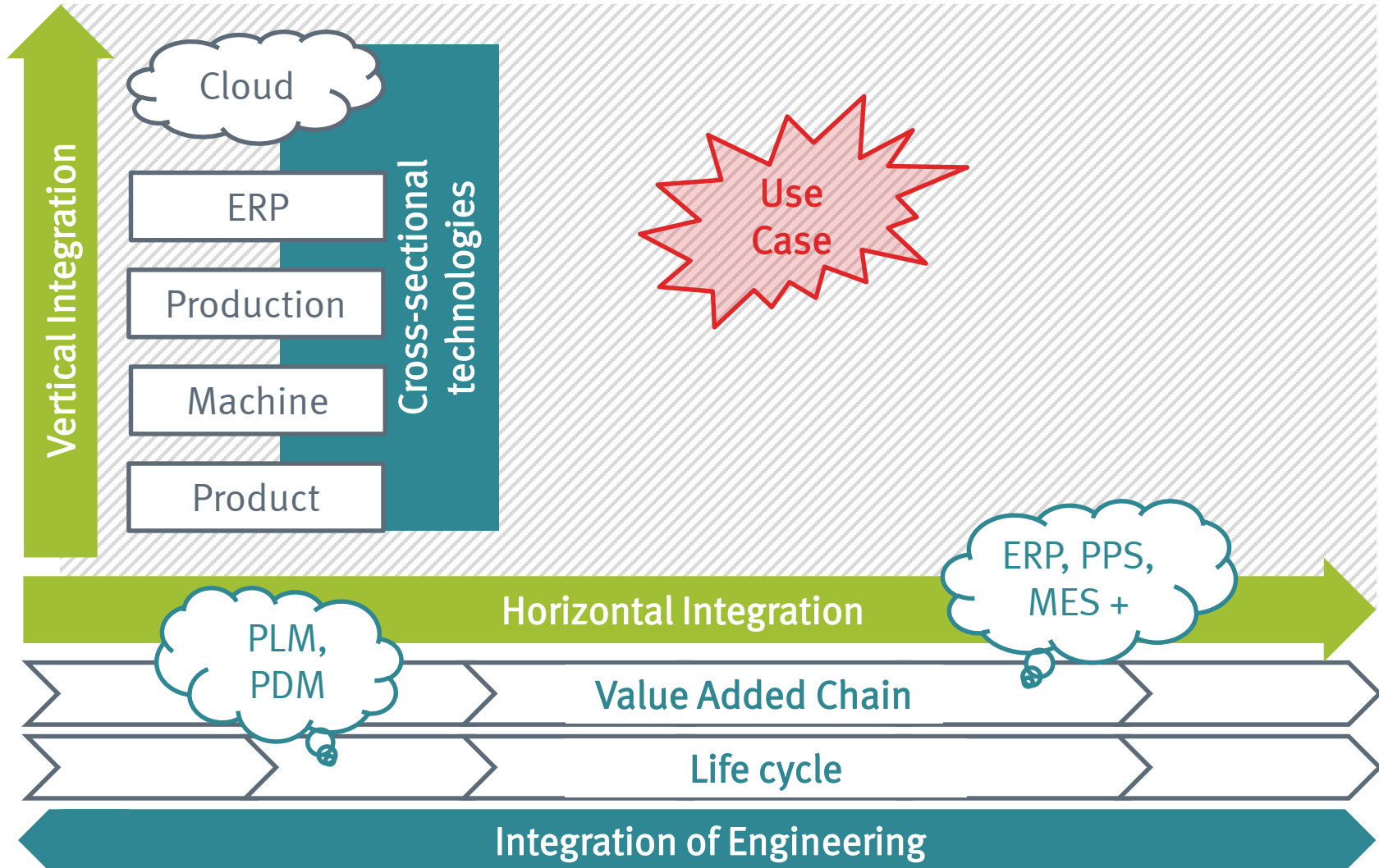
«Use Case» have a range of aspects

«Use Cases» are a combination of:

- Technologies
- Data
- Processes
- Methods / Models
- Services
- Safety / Security
- Standards

Large field of technologies

Production Technologies

Big Data

Labor 4.0

Artificial Intelligence

Sensors Actuators

Digital Life Cycles

Production Planning

Augmented Reality

Visualization

Resilient ICT

Production Control

Pervasive Computing

Supply Chain

Additive Manufacturing

Wireless Communication

Innovation Methodology

(System) Simulation

Vision Systems

ICT Security

Digital Business

Robotics

ICT Architecture

Block Chain

Identification Technologies

Digital Engineering

Data Safety

Assistence-Systems

* Not complete

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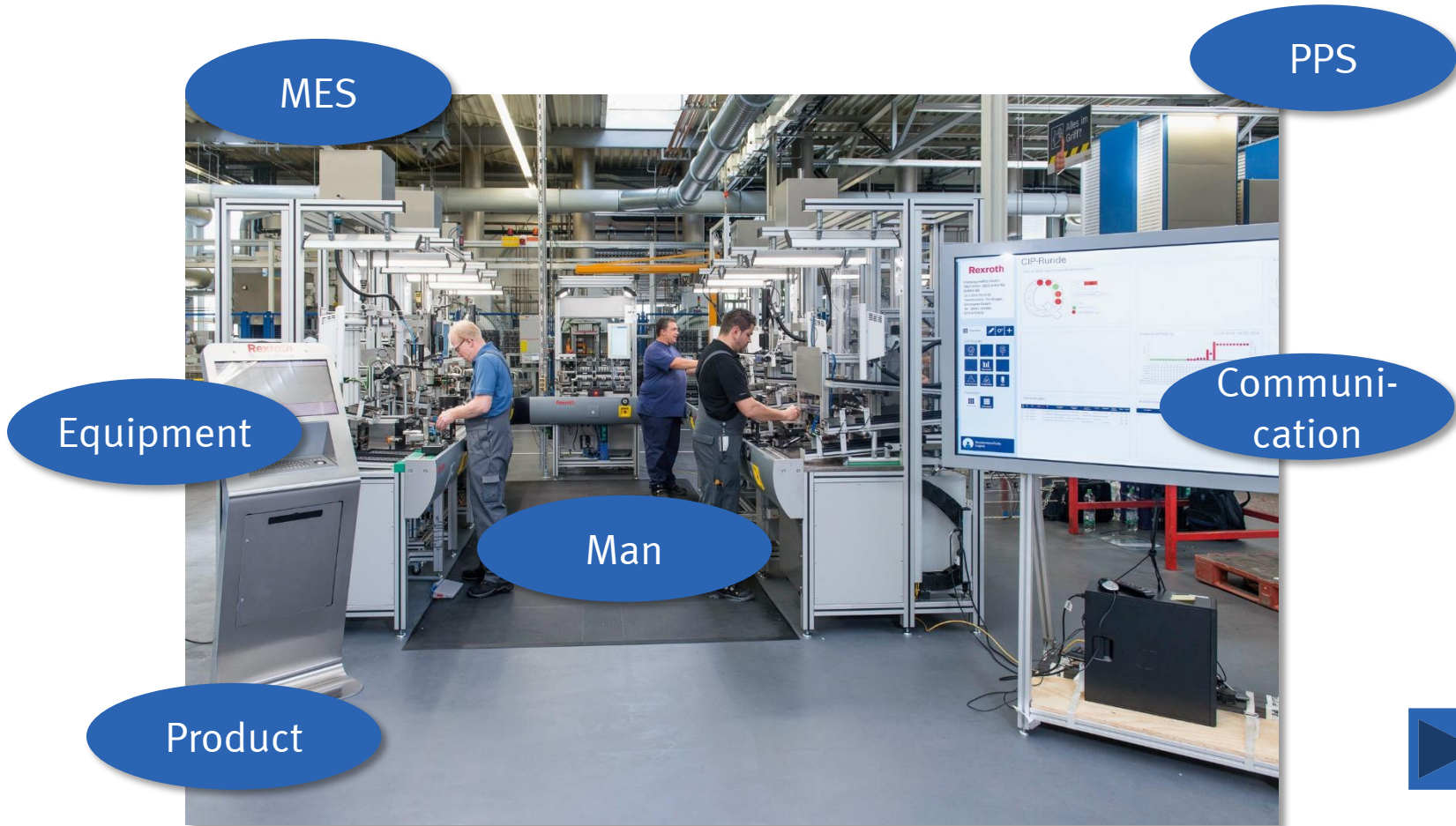# Cyber-physical Systems (CPS / CPPS)

Unit in the production system

→ Digitalization of production
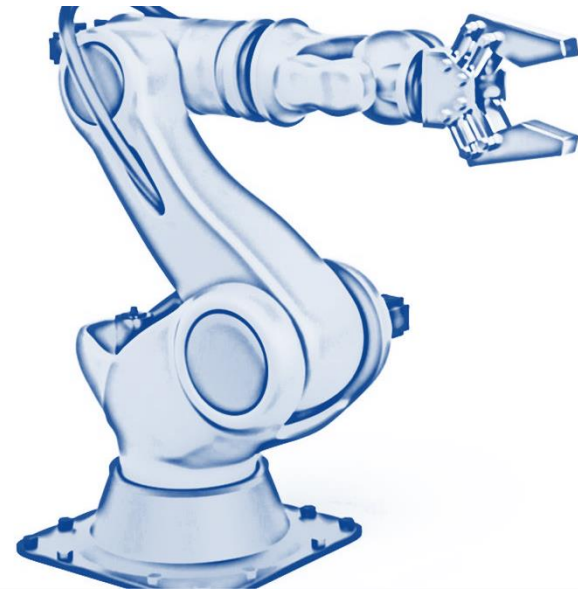
Digital image / modell in simulation, control, planing, ERP-systems
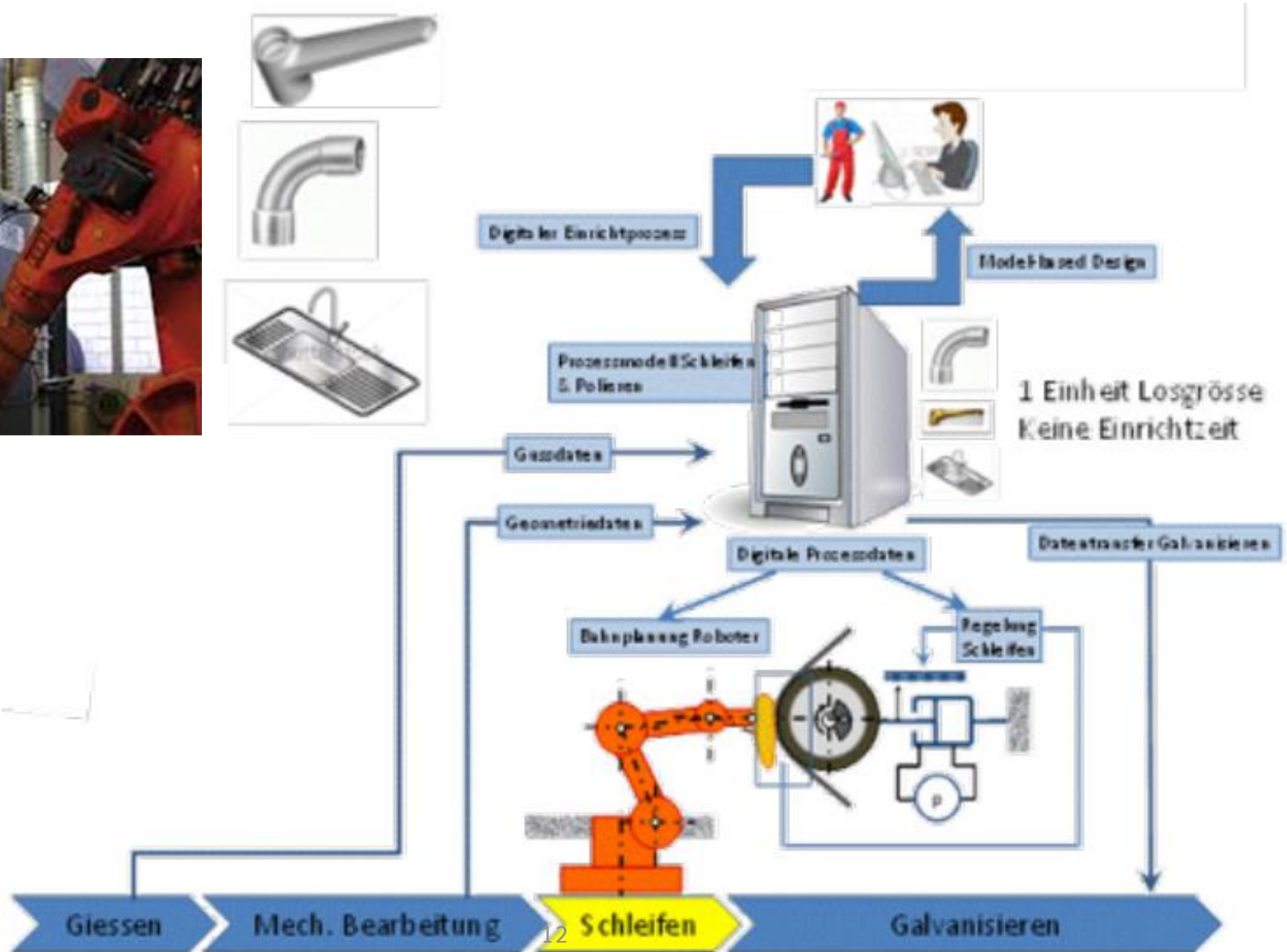
→ Connecting the IT world with production

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Example: Pilot Line Bosch Rexroth

Six basic types of disc valves in 200 variants → Enhanced assistance systems

Example: Digital Engineering for Faucets

Example: «Smart Factory» of Contractor FAES

- Reorganisation of shop floor (10'000 m2)

- Connecting all production equipment

- Automated and fully integrated tool, master tools and c-part preparation with KANBAN-link to supplier

- Real-time data evaluation for production and manufacturing cockpit

- 24/7 monitoring of network and equipment with alert system

- Barcode and RFID for material flow and work-in-progress

→ Fully transparent value chain

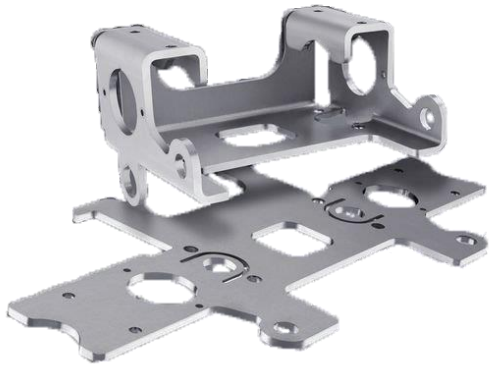→ Integration into customers value added chain

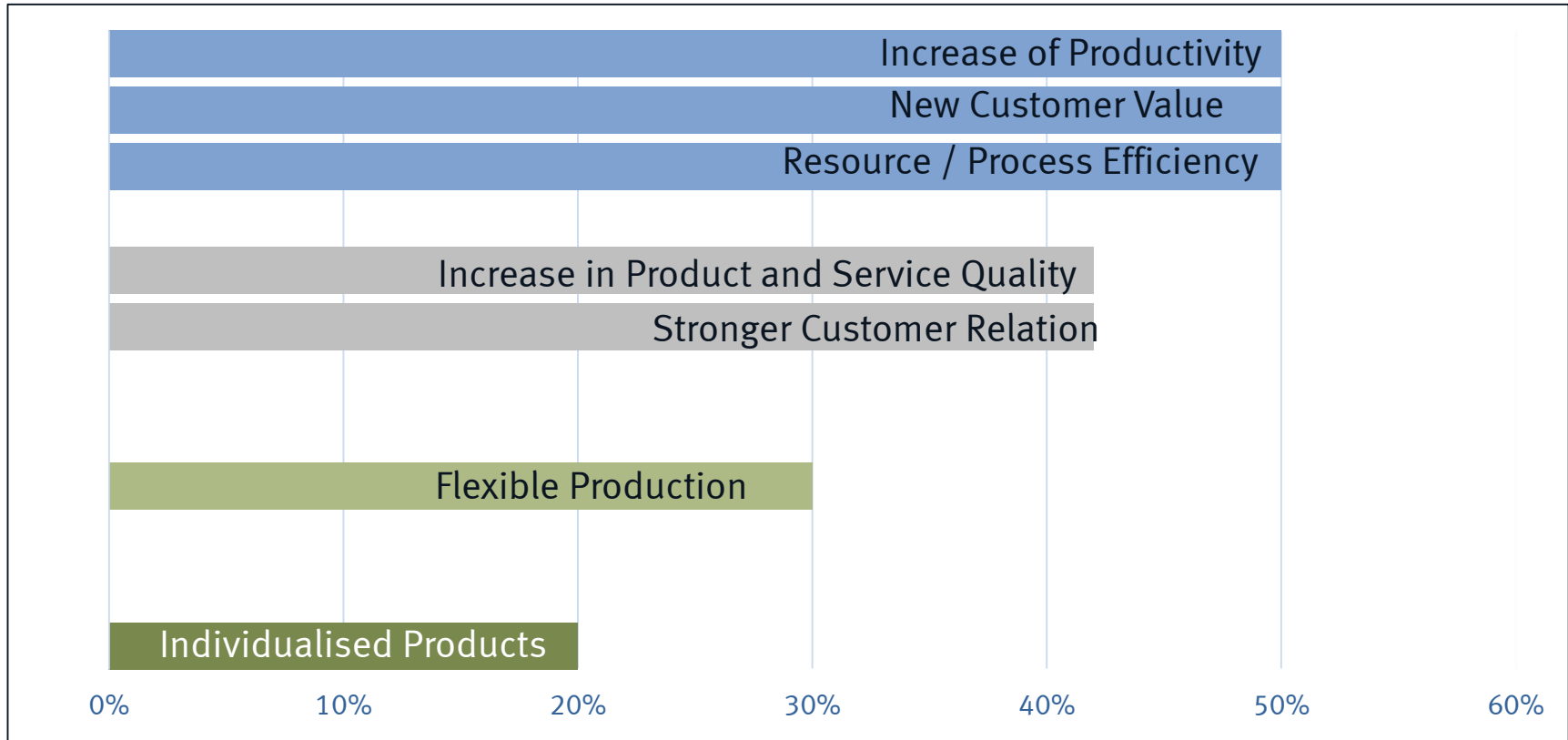# Example: Online Shop for Sheet Metal Parts

Online shop for producibility, pricing and ordering of sheet metal parts
(company located in Switzerland)

- Import CAD data

- Check producibility of parts online

- Calculate price online

- Prepare online offer

- Order online

Where is the biggest benefit of Industrie 4.0?

Percentage of companies/ multiple answers allowed

Increase of Productivity						
New Customer Value						
Resource / Process Efficiency						
Increase in Product and Service Quality						
Stronger Customer Relation						
Flexible Production						
Individualised Products						

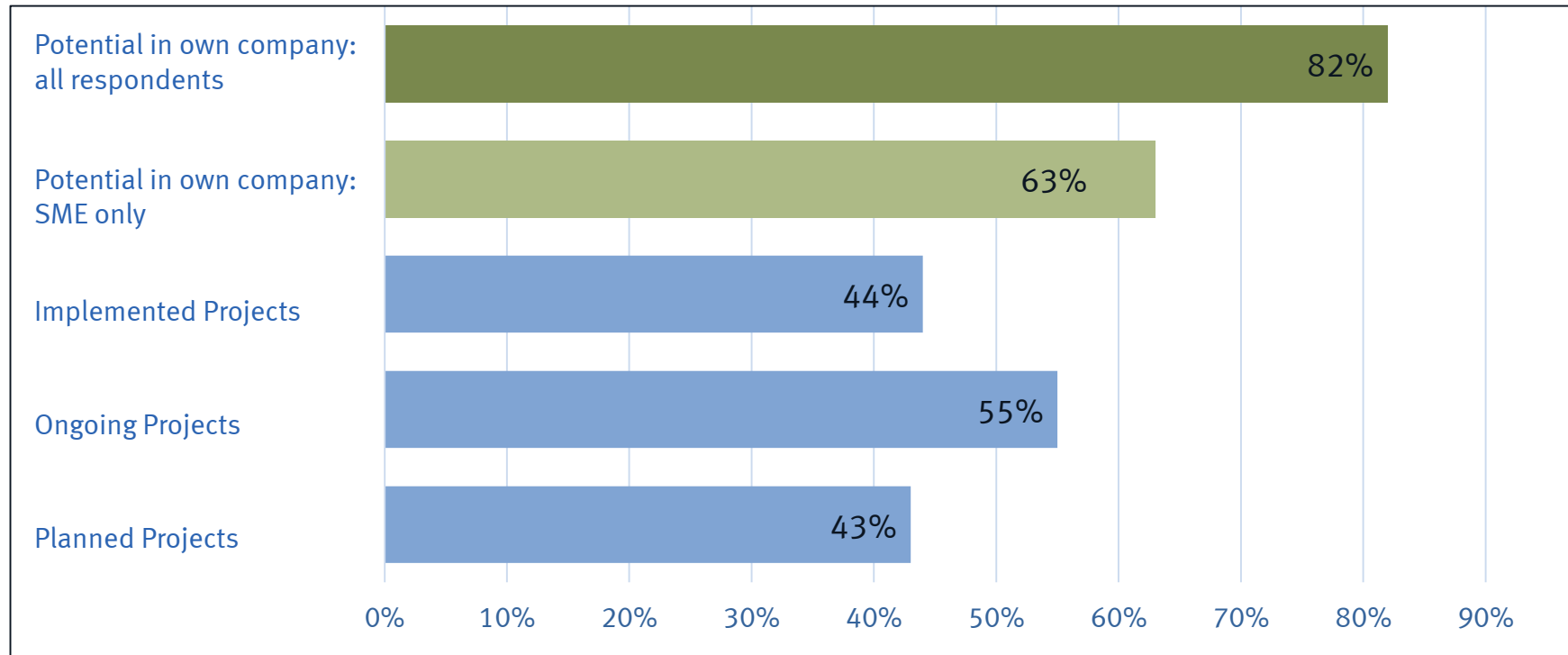0%   10%   20%   30%   40%   50%   60%

82% of the respondents see one or multiple benefits in the concept Industrie 4.0

Source: Swissmem Survey May/June 2016

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Status of Project Implementation

Percentage of companies/ multiple answers allowed

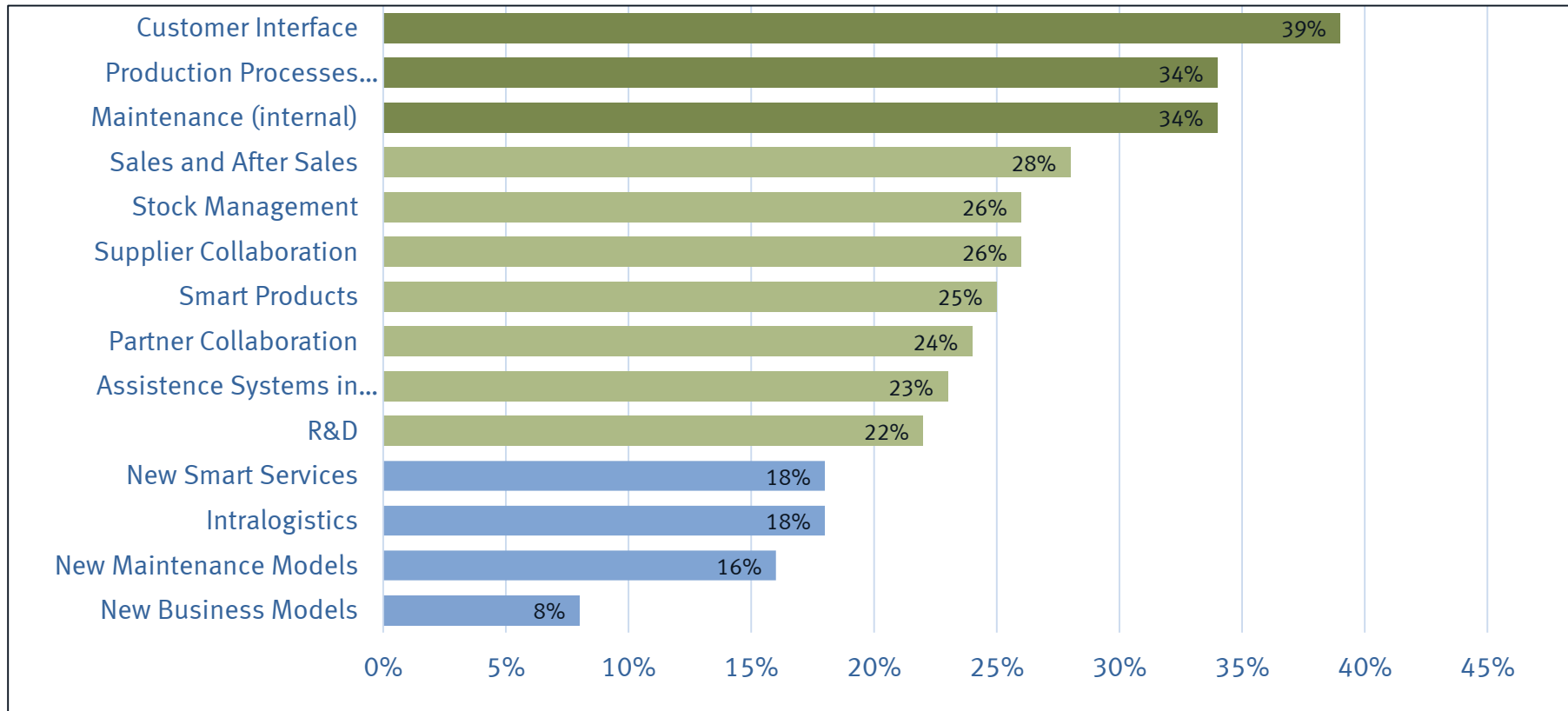| Category	Percentage
Potential in own company: all respondents	82%
Potential in own company: SME only	63%
Implemented Projects	44%
Ongoing Projects	55%
Planned Projects	43%

Amongst the respondents 1'225 projects are implemented, running or planned. Of those 718 are with SME.

Source: Swissmem Survey May/June 2016

Implemented Projects

Percentage of companies/ multiple answers allowed

Category	Percentage
Customer Interface	39%
Production Processes…	34%
Maintenance (internal)	34%
Sales and After Sales	28%
Stock Management	26%
Supplier Collaboration	26%
Smart Products	25%
Partner Collaboration	24%
Assistence Systems in…	23%
R&D	22%
New Smart Services	18%
Intralogistics	18%
New Maintenance Models	16%
New Business Models	8%

Source: Swissmem Survey May/June 2016
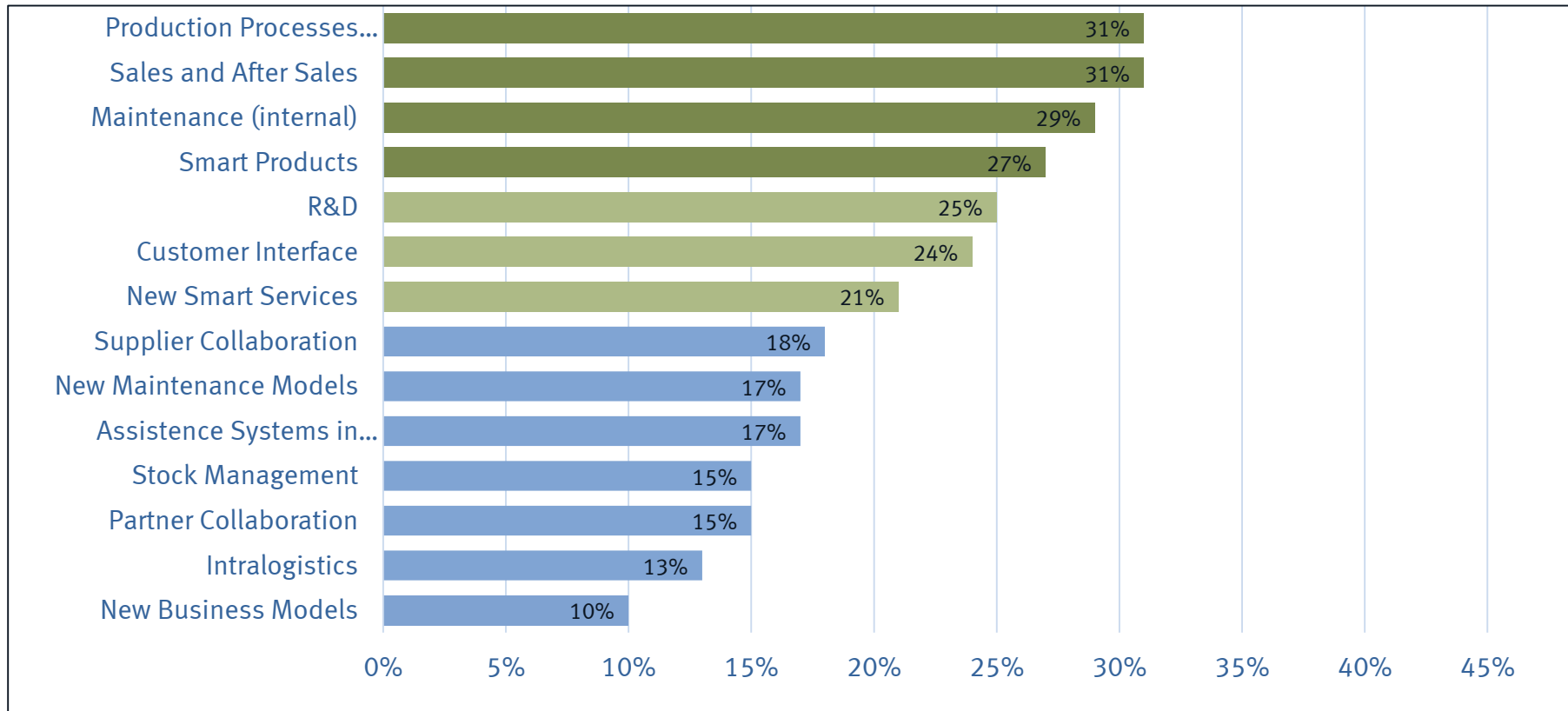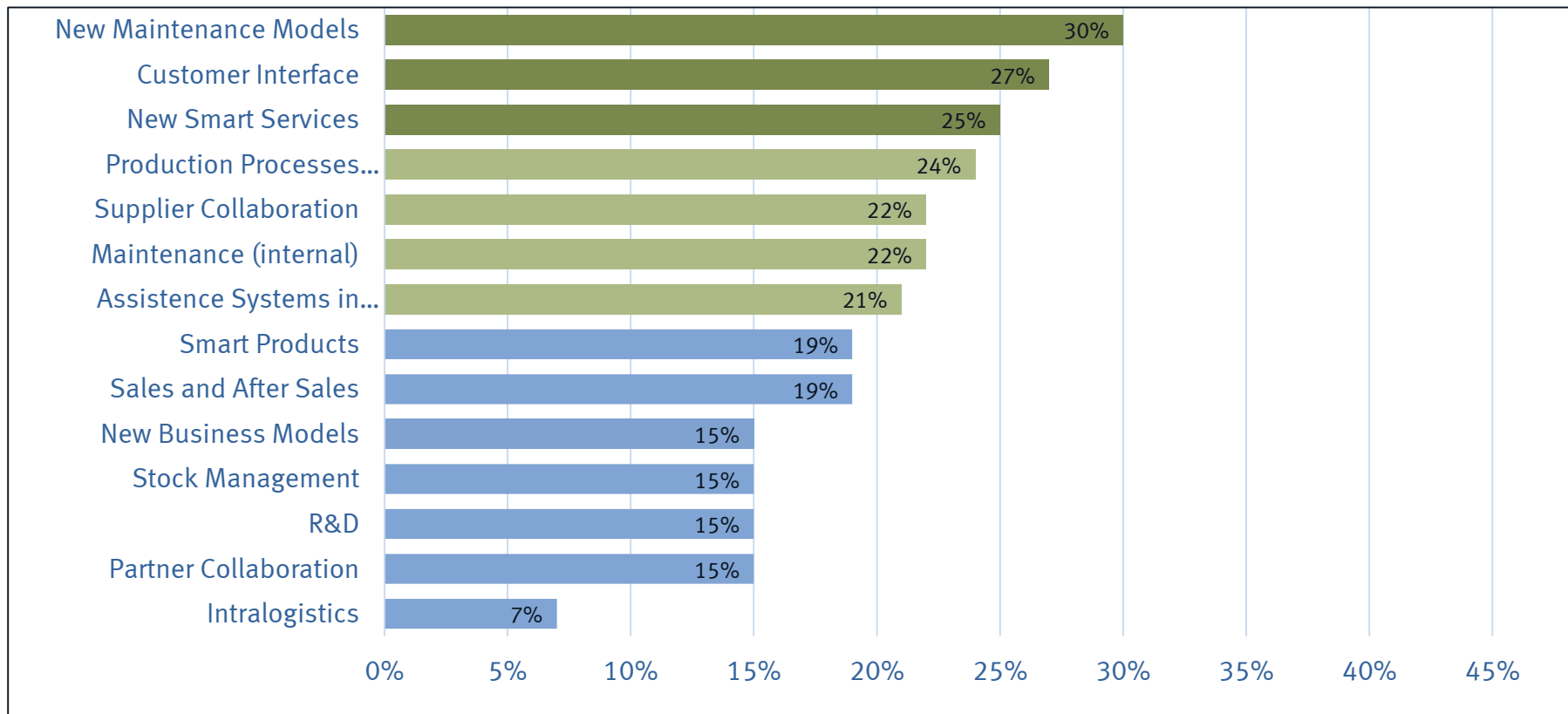
Ongoing Projects

Percentage of companies/ multiple answers allowed

Source: Swissmem Survey May/June 2016

Planned Projects

Percentage of companies/ multiple answers allowed

Project	Percentage
New Maintenance Models	30%
Customer Interface	27%
New Smart Services	25%
Production Processes...	24%
Supplier Collaboration	22%
Maintenance (internal)	22%
Assistence Systems in...	21%
Smart Products	19%
Sales and After Sales	19%
New Business Models	15%
Stock Management	15%
R&D	15%
Partner Collaboration	15%
Intralogistics	7%

Source: Swissmem Survey May/June 2016

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What are the biggest obstacles?

Percentage of companies / multiple answers allowed

Missing understanding or incomplete conception of subject

Missing personel resources

Missing holistic strategy on Industrie 4.0

0%   10%   20%   30%   40%   50%   60%
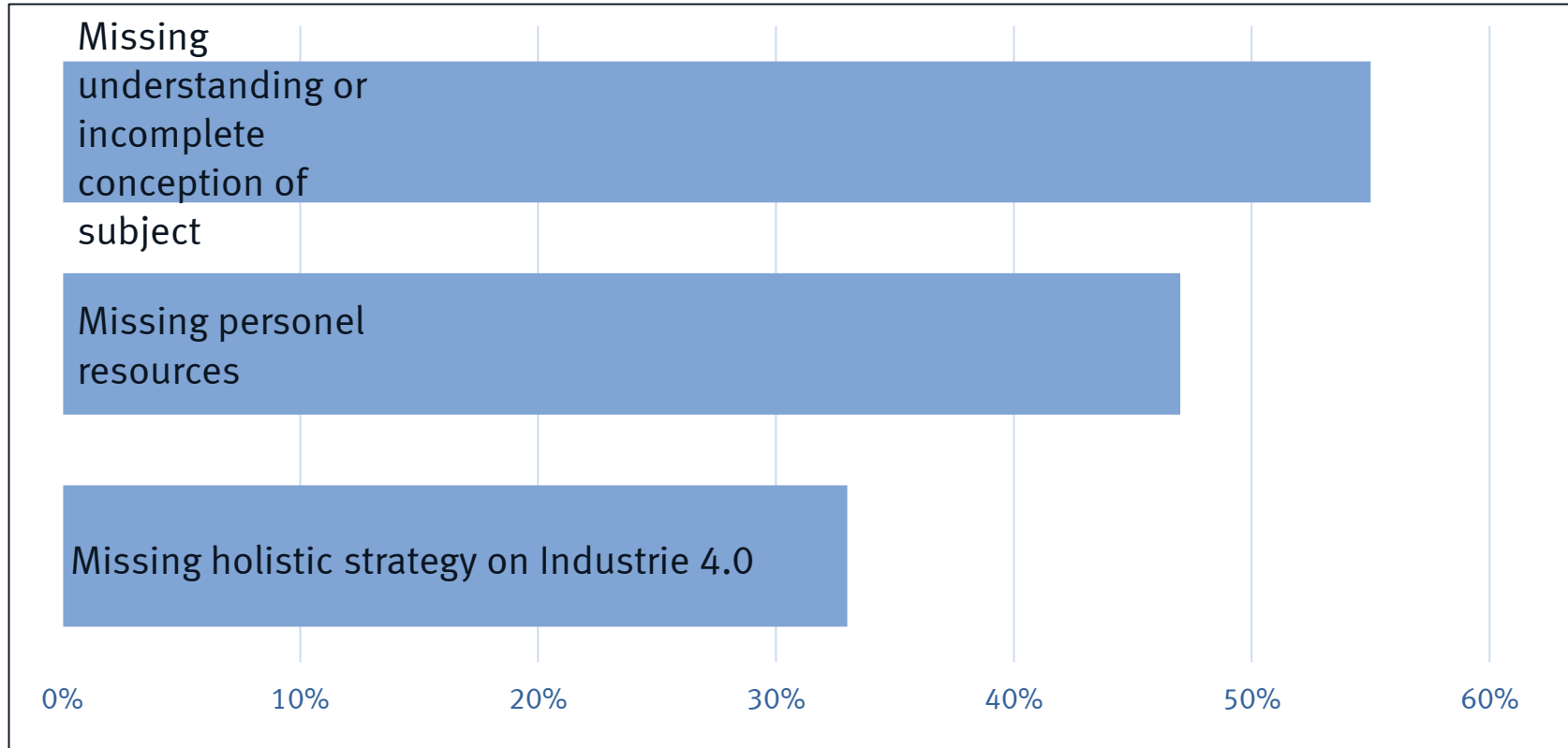
Source: Swissmem Survey May/June 2016

Obstacles for I 4.0 Implementations

Percentage of companies / multiple answers allowed

Obstacle	Percentage
Missing personel ressources	47%
Missing holisitic strategy on I40	33%
Profitability unclear/not given	30%
Missing know-how on I40	29%
Customer benefit unclear/not given	27%
Missing conception on I40	26%
Missing technologies	25%
Missing funding	23%
Organizational change required	17%
Other obstacles	15%
Missing skills with staff or labour market	13%
No obstacles	8%
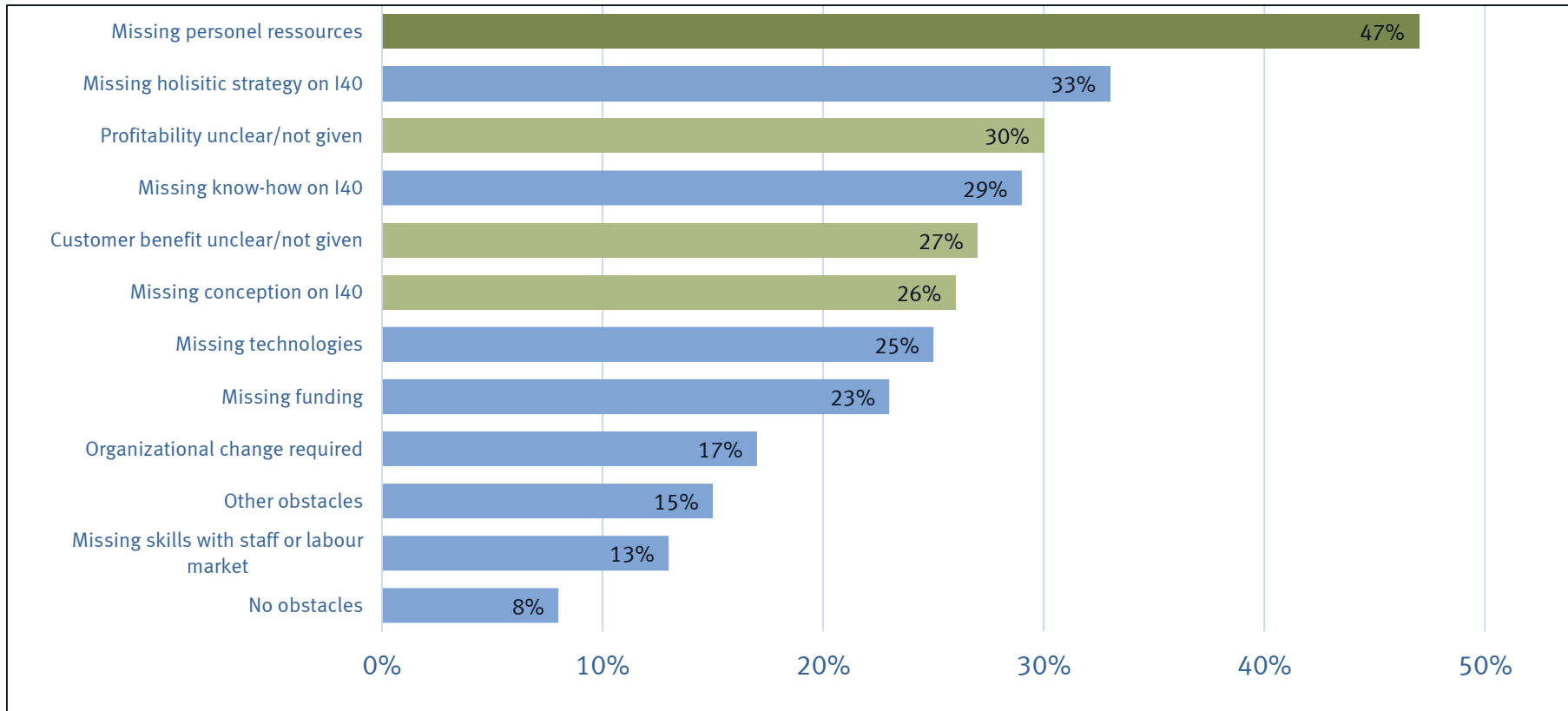
Source: Swissmem Survey May/June 2016

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The Companies

- Show openness and curiosity

- Embrace Industrie 4.0 as a strategic issue of the board

- Develop a vision / roadmap on Industrie 4.0 / digitalisation

- Analyse weakness in the value chain

- Identify new potentials for products and services

- Have «LEAN» in their DNA

- Manage the required Change Management

Take the Challenge!

National Initiative for Industrie 4.0

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- inform
- raise awareness
- network
- promote

www.industrie2025.ch
@Industrie2025

Networking and knowledge transfer (events, seminars)	**Support** (on-site workshops, seminars, basic training)
Technical topics (working groups, whitepapers, studies)	**Innovation support** (R&D Conference, coordination)

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