

enabling new business

 **SWITZERLAND  
GLOBAL  
ENTERPRISE**

Whitepaper – Opportunities for the Swiss Export Industry, April 2016

# INDUSTRY 4.0



## Preface

### Industry 4.0 and its impact on internationalization

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Industry 4.0, or the fourth industrial revolution, does not only affect small and medium-sized manufacturing enterprises. The rapid digital transformation impacts the global business of all companies: value chains will be more flexible and agile and organized in a more fragmented manner. Real-time data will be of the utmost importance and data analytics skills a key requirement.

Never before did small and medium-sized enterprises have the possibility to play such a role in the international business environment. Manufacturing networks, co-operation and partnerships within the field of innovation and production technology are becoming increasingly important. This will lead to new international direct sales channels.

How can small and medium-sized enterprises start to address such a transformation at an early stage? Which changes regarding co-operation with business partners, in terms of purchases or sales, will be inevitable?

These questions are some of the many that are addressed in this study. Our aim is to give you a in-depth overview of possible courses of action in order to position yourself for future international success.

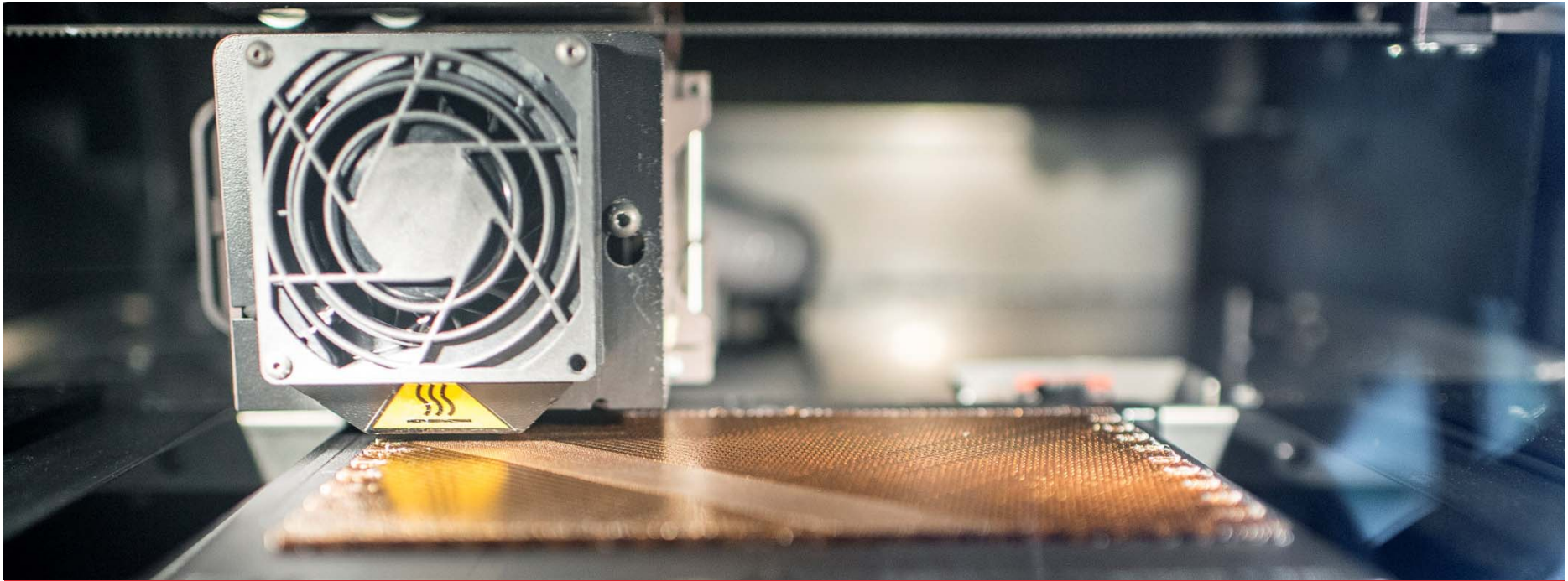
We encourage you to address the challenges of Industry 4.0 within your company in good time.



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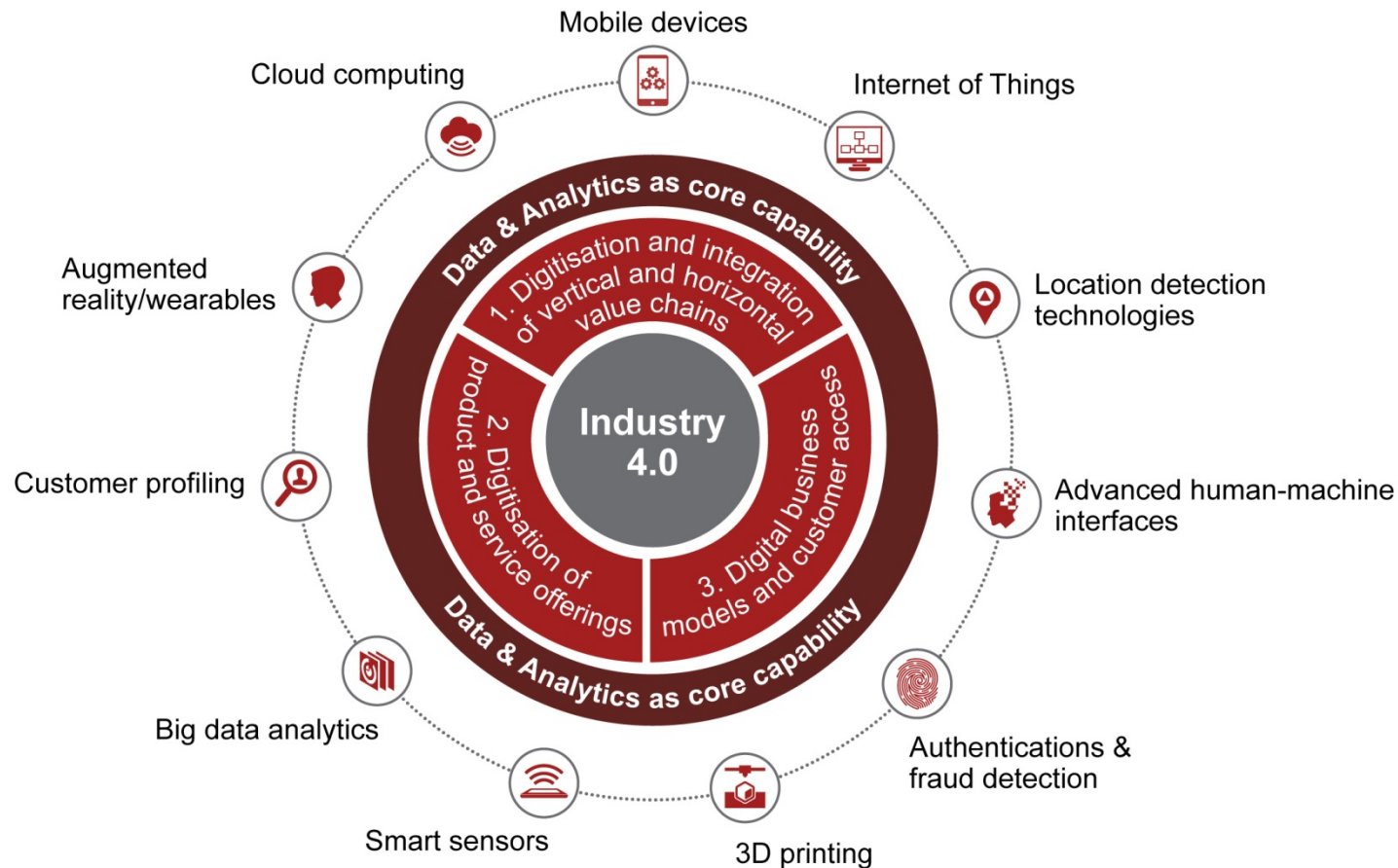
# SETTING THE SCENE

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*“Industry 4.0 will transform our entire value chain and allows us to develop innovative products and services. We must act now.”*

CEO of a manufacturer of processing machines

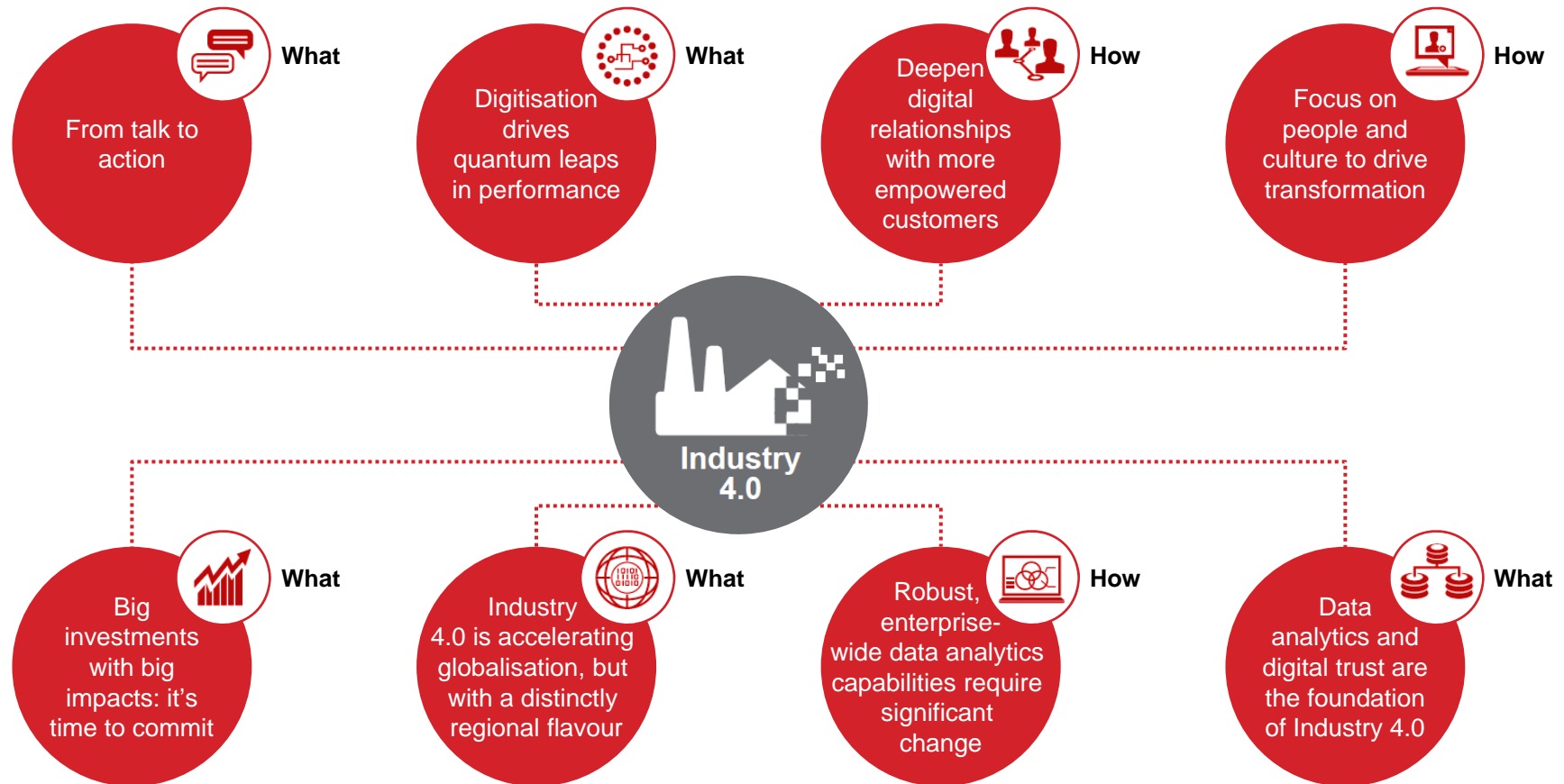
## Industry 4.0 is a journey towards a complete value chain transformation driven by new technologies and new collaborative business models



Source: PwC Strategy&

- What: Industry 4.0 combines advanced connectivity and advanced automation, cloud computing, sensors and 3D-printing, connected capability, computer-powered processes, intelligent algorithms and 'internet of things' (IoT) services which will at the end transform current business models.
- How: Export-oriented SMEs need to think carefully about their position within global end-to-end value chains to identify new opportunities, but also potential threats to their current business model.

## Industry 4.0 will accelerate globalization, but with a distinctly regional flavour Switzerland has the best pre-conditions

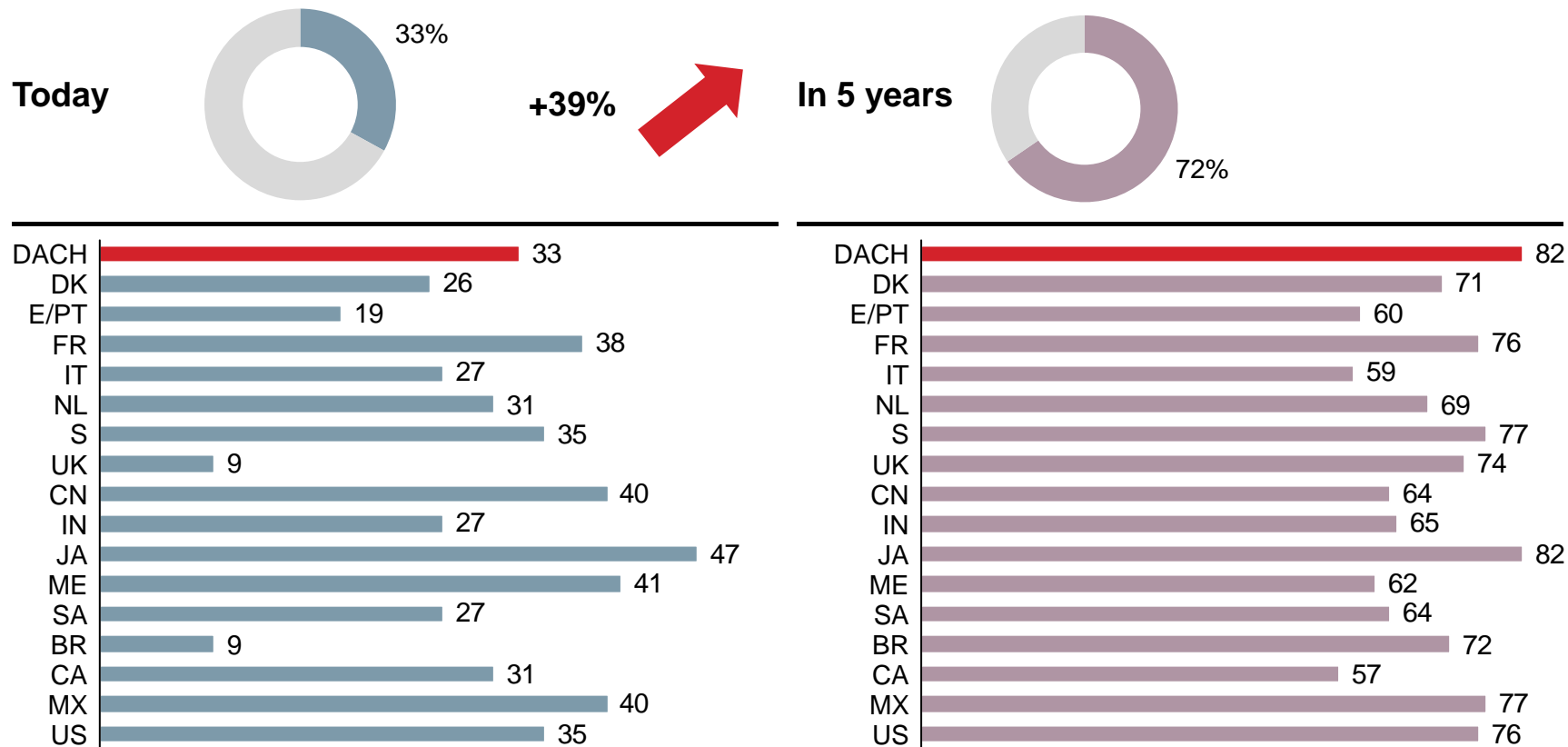


Source: PwC Strategy&

- What: Industry 4.0 will fundamentally reshape the competitive landscape and bring fundamental change to established industries also here in Switzerland.
- What: Industry 4.0 will create digital networks and ecosystems that in many cases will span the globe, but still retain distinct regional footprints - "Think global – act local" will be essential for SMEs.
- How: Start experimenting with new Business Models and watch out for inspiration for your Industry 4.0 vision.

## Industry 4.0 – digitization levels will increase dramatically

Switzerland has best chance to be at the forefront of digital winners



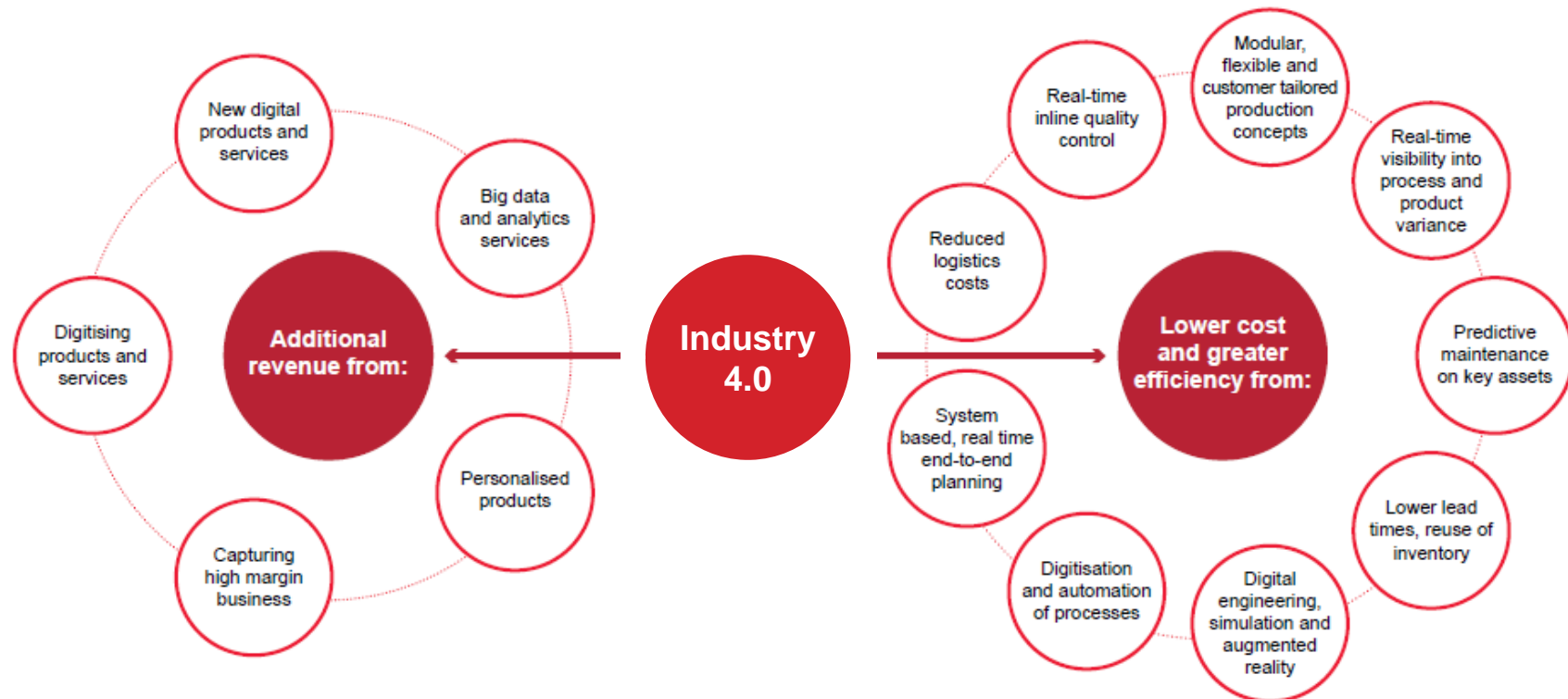
Note: Figures in %

Source: PwC Strategy&

- **What:** Across the world, companies are expecting a significant impact on digitization and integration. Advanced implementation of Industry 4.0 will become a 'qualifier to compete' and is also likely to be seen by investors as a 'qualifier for funding'.
- **How:** Swiss companies have to adapt quickly and find their Industry 4.0 strategy. They can start by investing in their digital capabilities - from digitizing product development, reducing costs along the entire value chain.

## Industry 4.0 is delivering revenue, cost and efficiency gains

The window of opportunity is short, but exporting Swiss SMEs are used to adapt quickly

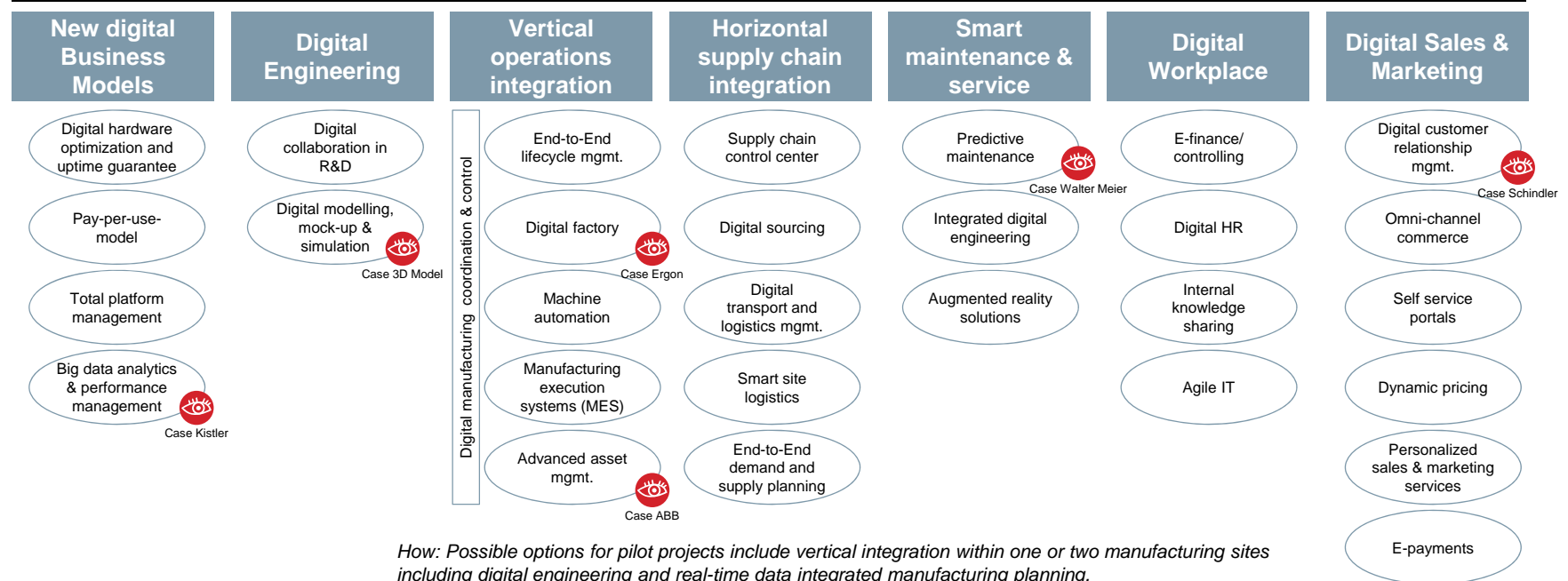


Source: PwC Strategy&

- What: As Industry 4.0 develops, the traditional model of products pushed out to the market will fade and 'customer pull', with customers intimately involved in a more collaborative relationship with manufacturers, will be much more the norm. Personalized products and customized solutions will generate significantly higher margins.
- What: Real time end-to-end planning and horizontal collaboration improve efficiencies and reduce cost.
- How: Exporting Swiss SMEs can begin by evaluating the future value streams coming from "IoT" and identify cost drivers in their end-to-end value chain.

# Industry 4.0: digital export opportunities exist along the entire vertical and horizontal value chain – exporting Swiss SMEs can start with initial pilot projects

## Core skills and capabilities



## Enabling factors

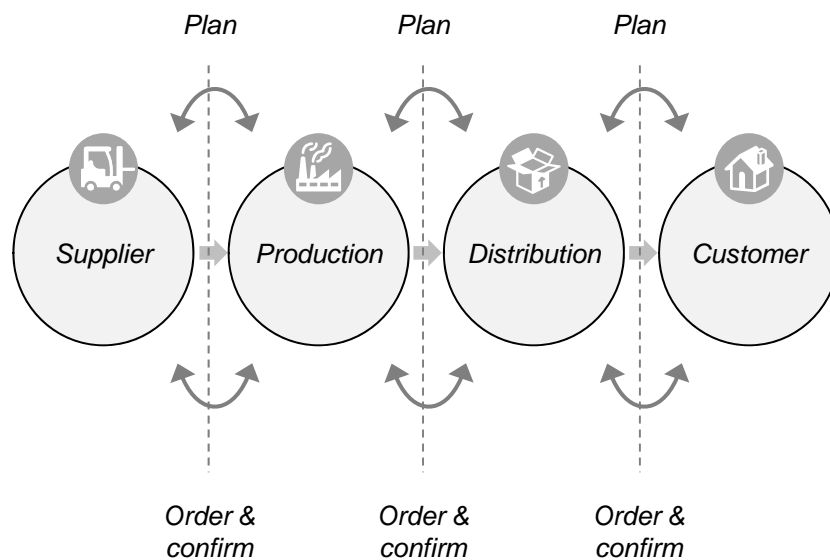


- How: Pick the right projects to secure funding and stakeholder buy-in, focus your efforts on a limited and valuable number of initiatives; pilot projects show proof of concept.
- How: Setting up cross-functional teams.
- How: Collaborate with partners outside your organization (start-ups, universities, or industry organizations).

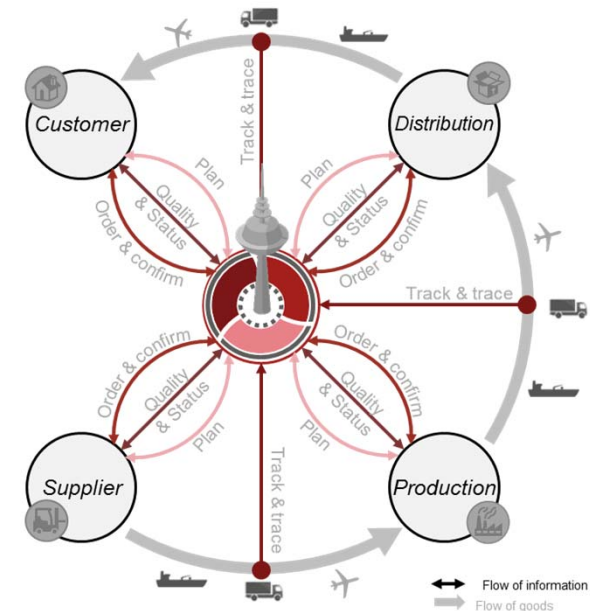


## Horizontal integration along the entire value chain transforms functional silos into an end-to-end supply chain network – Swiss SMEs need to take action

### Traditional supply chain Model



### Integrated supply chain ecosystem



- What: With Industry 4.0 the traditional supply chain models will shift to a more virtual model, with small very flexible and agile supply chains and a market place in the center, orchestrating all players (suppliers, customers) at the same time; new players are already positioning themselves (e.g. Google, Alibaba, Amazon, but also traditional B2B manufacturing companies) providing such platforms and “owning” the customer and supplier data.
- How: SMEs need to assess their position and act accordingly and start developing your platform approach to stay close to customers.

## Digitization and integration across the whole value chain are critical capabilities – Areas of investments to unlock opportunities for Swiss SMEs

### Sourcing 4.0:

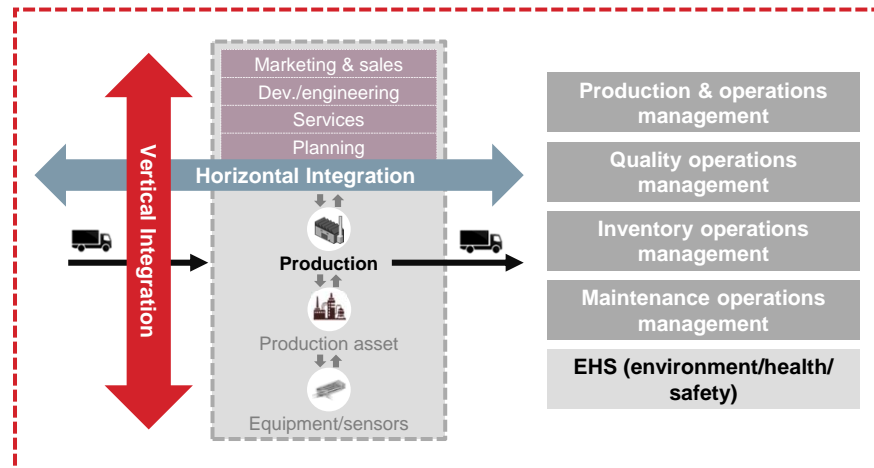
- Vendor Managed Inventories (VMI)/auto-replenishment
- “Touch-less” order process
- Integrated development and R&D
- Collaborative order management
- Channel inventory visibility
- On-site 3D printing of spare parts

### Planning 4.0:

- System based, end-to-end integrated planning
- B2B collaboration and multi-enterprise network planning platforms
- Multi-echelon inventory optimization
- Demand sensing and analytics; cross network analytics

### Order management 4.0:

- Full order transparency
- “Perfect order” multi-tier, real-time ATP capabilities
- “Touch-less” order process, customer system connectivity



### Logistics 4.0:

- Track and trace capabilities, sensor-equipped logistics
- Autonomous logistics, automated guided vehicles
- Automated warehouse systems
- In- and outbound logistics visibility

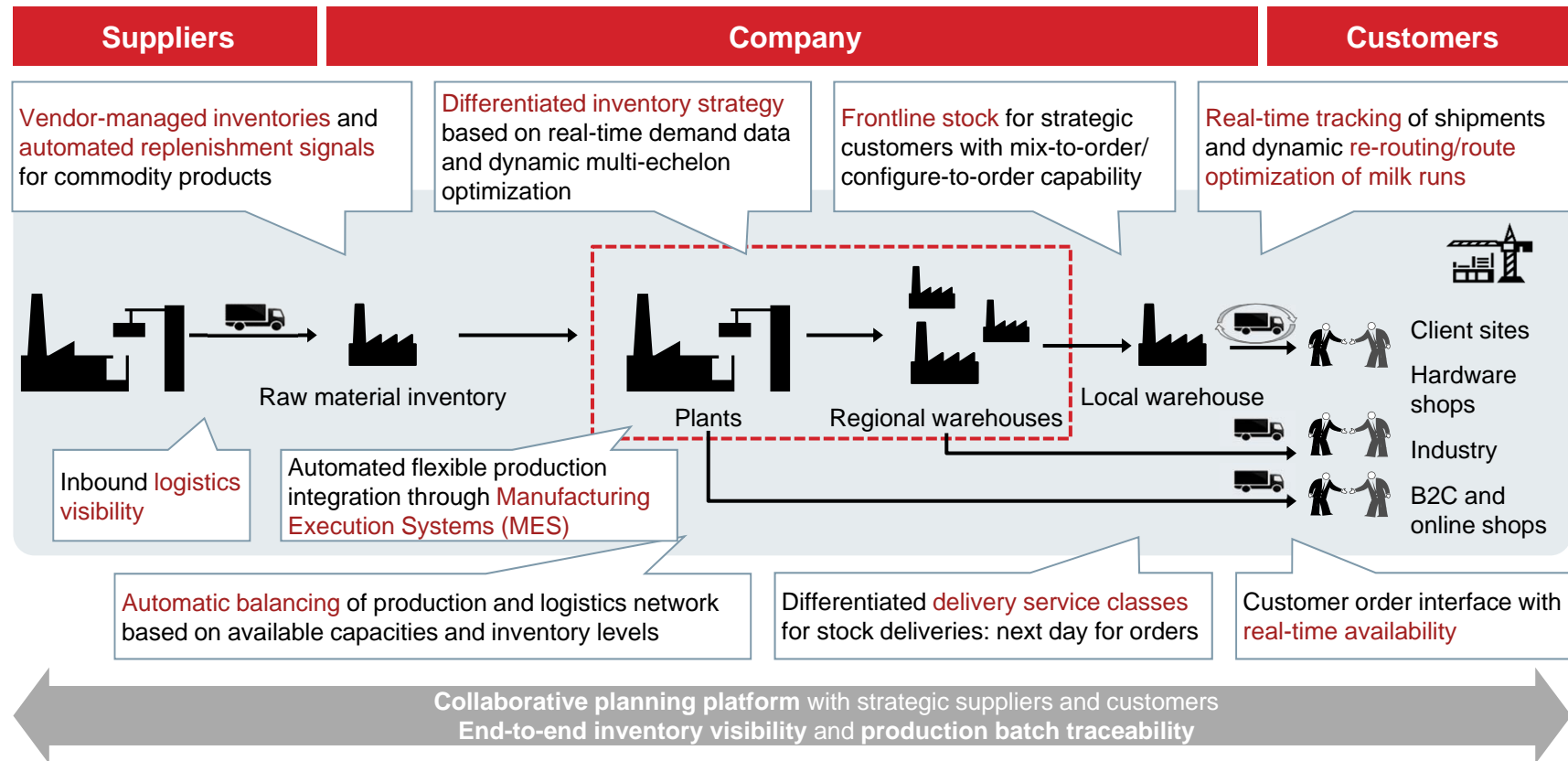
### Data analytics:

- Integrated data models across the value chain and product life cycle allowing meaningful insights
- Advanced analytics and processing capabilities (e.g. cross-network analysis, end-to-end inventory visibility)

### Manufacturing 4.0:

- Integrated and digitised production resources with real-time communication across system; use of manufacturing execution systems (MES)
- Six sigma quality, using connected sensors and supplier input
- Intelligent products/tools communicating with production resources

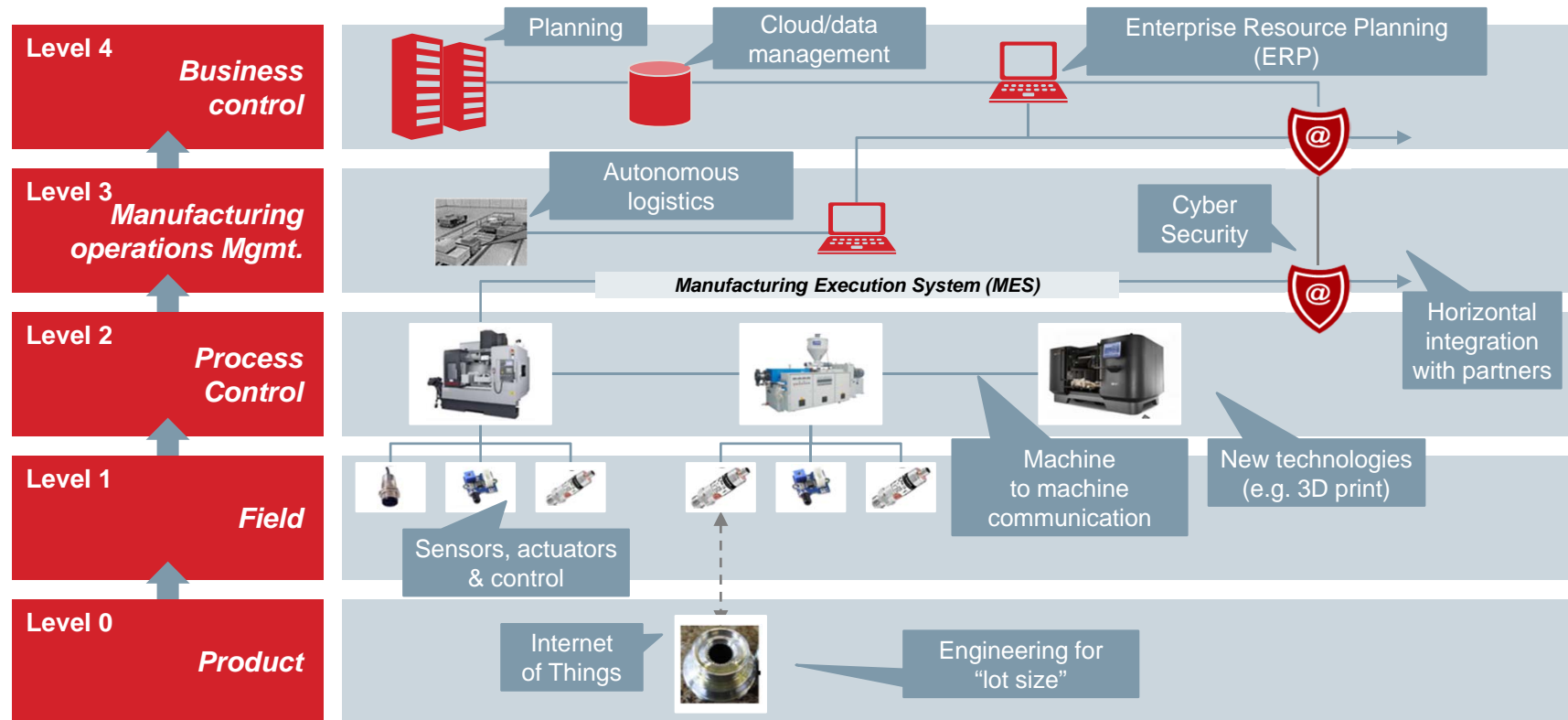
## Horizontal integration – essential for SMEs as most of them are suppliers for OEMs in an global and highly competitive market environment



- What: Industry 4.0 will shorten the supply chains and reduce cycle times and lead times, therefore accurate customer demand signals and visibility of product availability along the whole supply chain (end-to-end) will increase investment needs in such areas – often SMEs do not have this in place today.
- What: With real-time information on the customer side, the expectation of delivery quality and delivery time will increase dramatically - in B2C the “one hour delivery” expectation will be the future normal.
- How: Start with assessing the maturity of your IT-systems (data exchange, data security) and collaboration partners.

## Vertical integration – strong need for collaboration and partnering

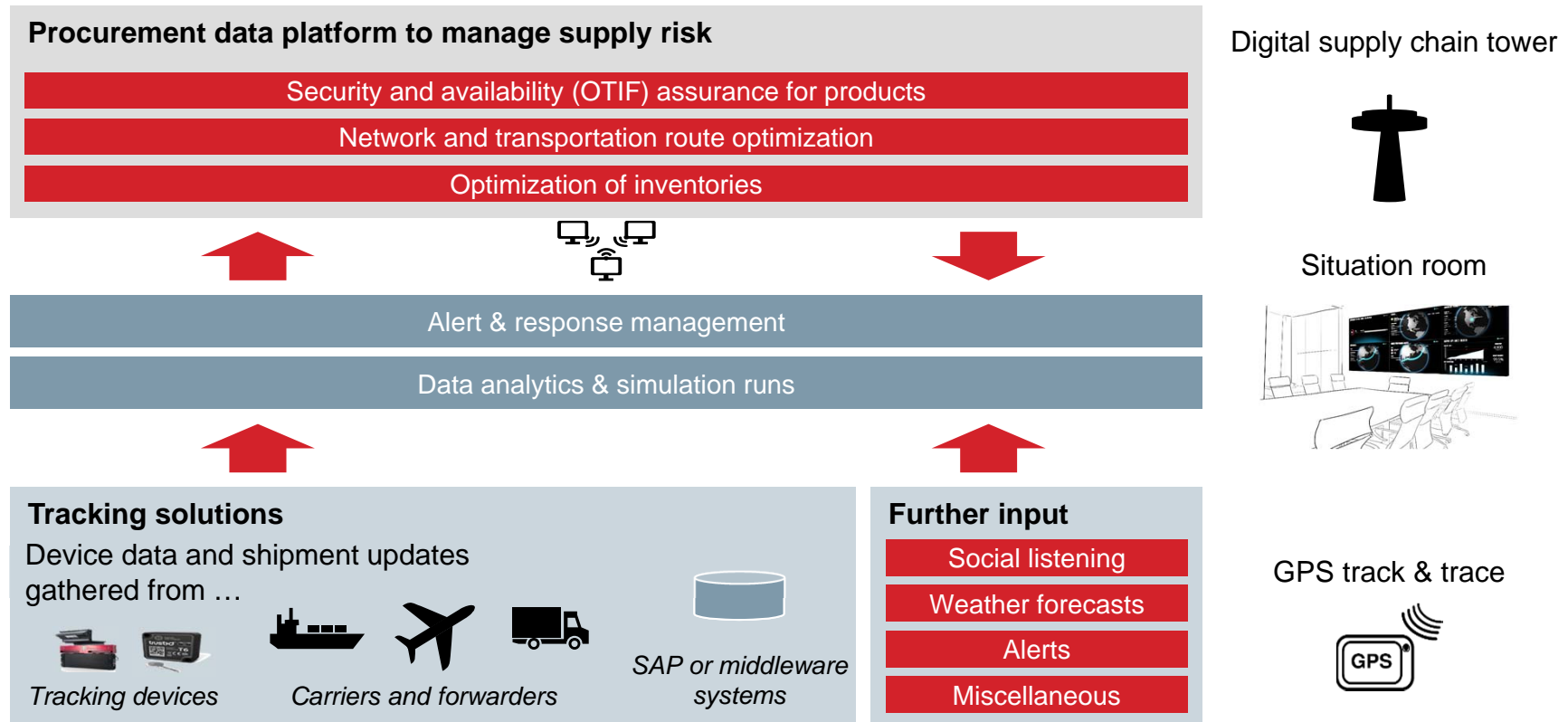
Connectivity and integration within an organization will increase dramatically



- What: Transitioning to digitally connected assets and operations leads to improved manufacturing performance, which is vital for the next level of productivity and efficiency gains in Switzerland and therefore secure local production with high automation at lower cost.
- What: Production and assembly lines equipped with sensors will reduce down-times, enable a better planning of maintenance during low utilization of assets, reduce inventories and manufacturing costs.
- How: Exporting Swiss SMEs need to identify the right partners as they will not have the capacity to cover all aspects.

## Procurement 4.0

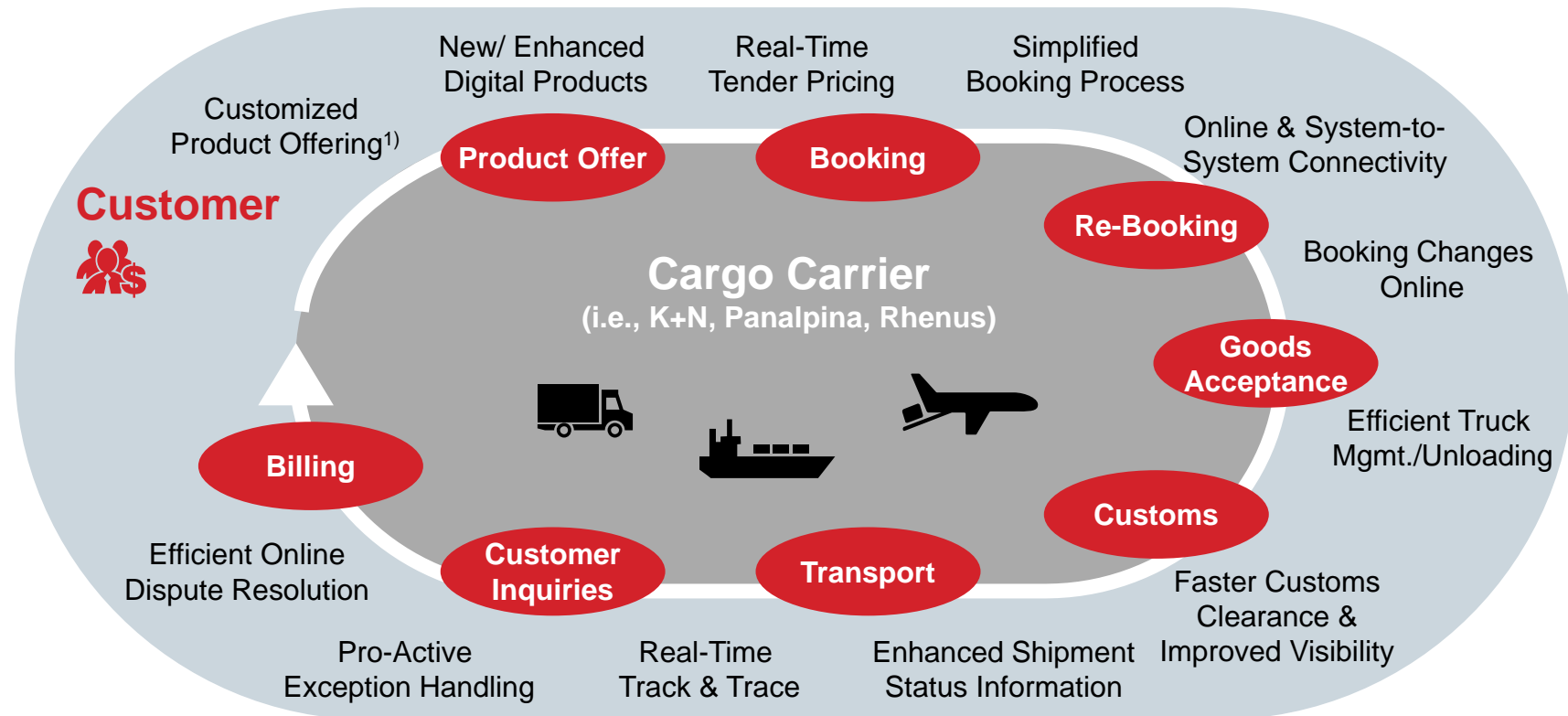
Combine real-time data with advanced algorithms to take planning decisions & avoid risk



- What: All data from suppliers, customers, distributors and captive production is integrated in real-time to optimize supply chain performance.
- What: Optimization focuses on reduction of lead times, freight and inventory management and overall supplier performance.
- How: Procurement 4.0 needs to play an integral role in managing suppliers and optimizing the end-to-end supply chain. As suppliers exporting Swiss SMEs need to be able to provide real-time data to OEMs.

## Logistics 4.0 – 1/2

Yield internal efficiency gains, improve customer interaction and generate revenue growth



































1) Enabling pro-active selling based on customer history

- What: Harmonization of information across different booking channels, automatic tender quotes, improvement of online product portfolio are typical forwarder requirements.
- What: Host-to-host integration has been implemented via CCS providers but direct integration is becoming more relevant for forwarders on both shipper and carrier side (e.g. eFreight).
- What: Offloads and delays can be reduced through early validation against regulatory and customs requirements.
- How: Swiss SMEs should invest in their connectivity capabilities, as Industry 4.0 is very much data driven.

## Logistics 4.0 – 2/2

Yield internal efficiency gains, improve customer interaction and generate revenue growth

Topic	Description	Relevance by Industry			
		Pharma & Chemicals	High Tech	Consumer Goods	Automotive & Industrials
<b>Real-Time Tracking</b>	Detailed and real-time track and trace information				
<b>Piece Level Tracking</b>	Visibility on piece level, especially in consolidation shipments				
<b>Proactive Exception Handling</b>	Proactive and actionable information in case of exceptions or delays				
<b>Additional Tracking Information</b>	Additional tracking information such as handling information, temperature etc.				
<b>Information Security</b>	Access to shipment content and tracking information strictly limited to involved parties				
<b>Booking &amp; Capacity</b>	Visibility into capacity on various routes in order to optimize shipments				
<b>Pricing Transparency</b>	Transparency on rates, surcharges and fees				
<b>Statistics</b>	Customer statistics for performance on specific routes as well as long term service quality				

# Advanced smart delivery solutions will contribute significantly to local asset utilization – in particular in combination with customer insight

## Logistics Visibility Platform

Pro-active logistics issue management  
Supply chain risk mitigation management



## Smart sensor replenishment

Sensor assisted auto-replenishment



Configurable non-touch ordering by algorithms

## Advanced Track & Trace

Active sensors  
Non-active  
RFID  
Bluetooth  
Mobile asset tracking with intelligent battery mgmt.



## Autonomous supply and loading

Autonomous supply  
Guided delivery  
Smart routing



Self-loading by robots with sensor assistance

## Advanced analytics/ Optimization

Flow analysis and optimisation  
Predictive maintenance  
Simulation planning for milk run routes



## Connected Workforce

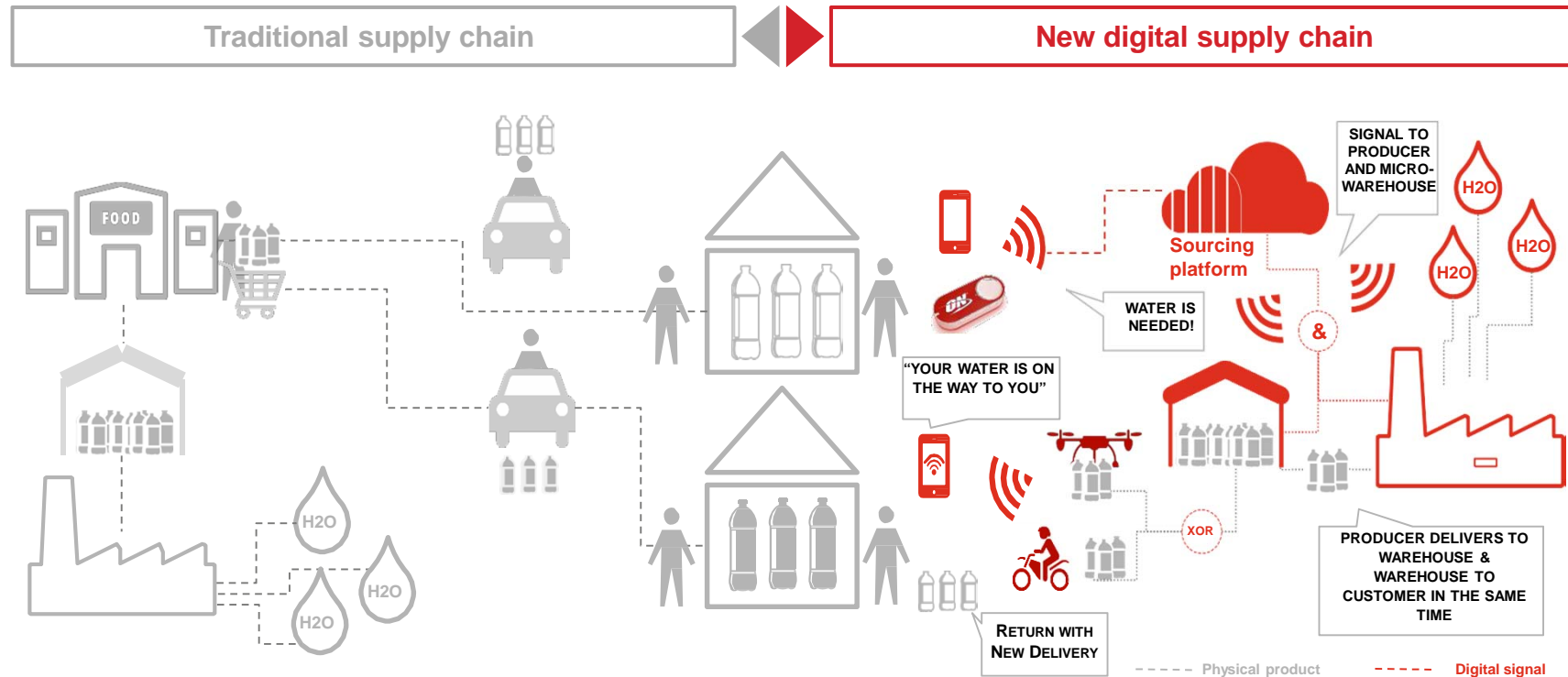
Augmented warehousing  
Collision prevention  
Support information



- What: Digitization of processes and integration of inbound, outbound and yard management reduces planning, transportation, handling and packaging costs while increasing delivery performance and asset utilization.
- How: For exporting Swiss SMEs, this means to get a good understanding of changing customer behaviours and knowing what kind of innovative products and services are required from your customers to ensure they can cope with Industry 4.0 is key.



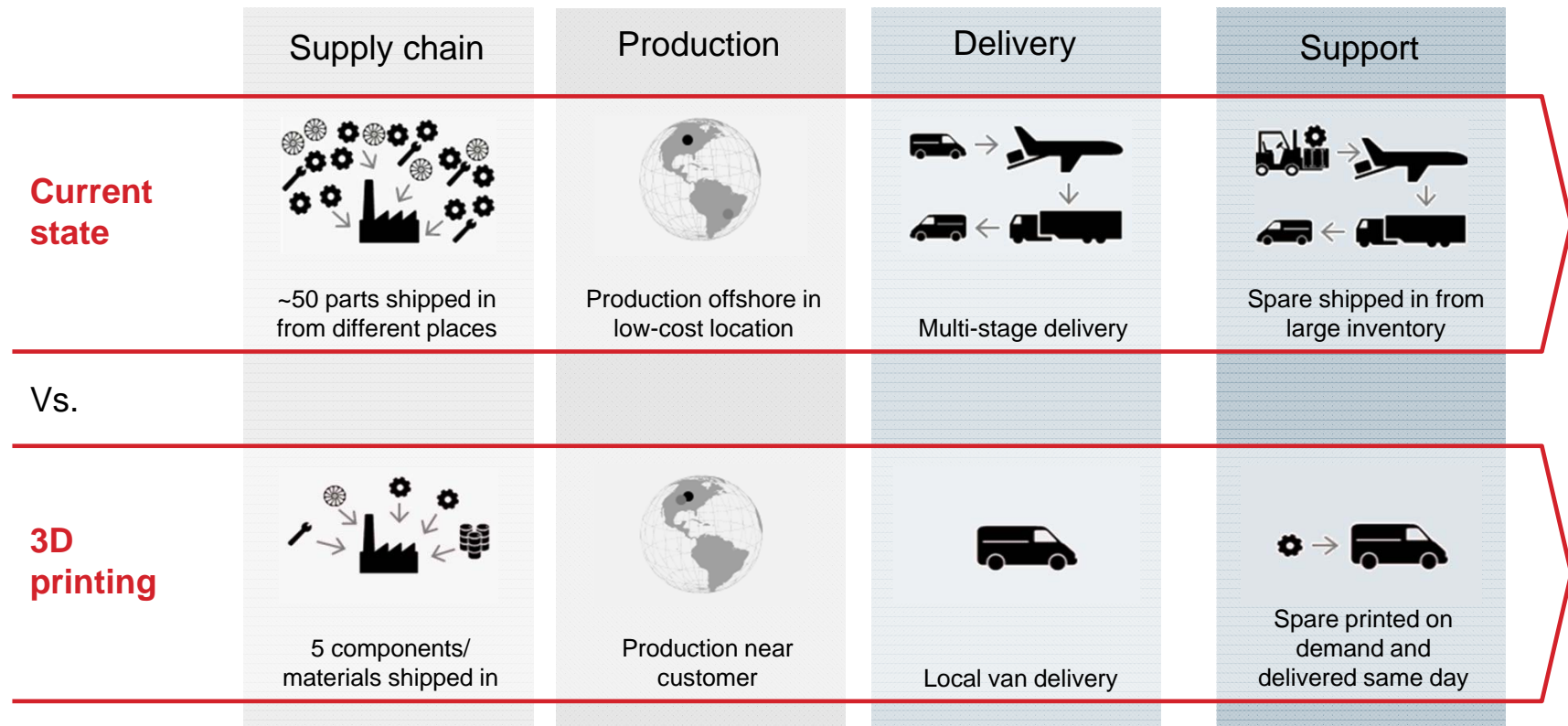
## Customer centricity combines autonomous transportation with smart home and consumer network technologies for end customer deliveries



- What: Digitization of processes and integration of inbound, outbound and yard management reduces planning, transportation, handling and packaging costs while increasing delivery performance and asset utilization.
- What: The consumer buying journey is increasingly cross-channel, with blurred lines between offline & digital channels.
- How: Swiss SMEs have to understand how near-shore production capabilities are affecting their deliver model and how they can get competitive advantage of such models.

## Additive manufacturing (AM) – 1/2

A game changer for exporting SMEs – Building blocks for digital business models

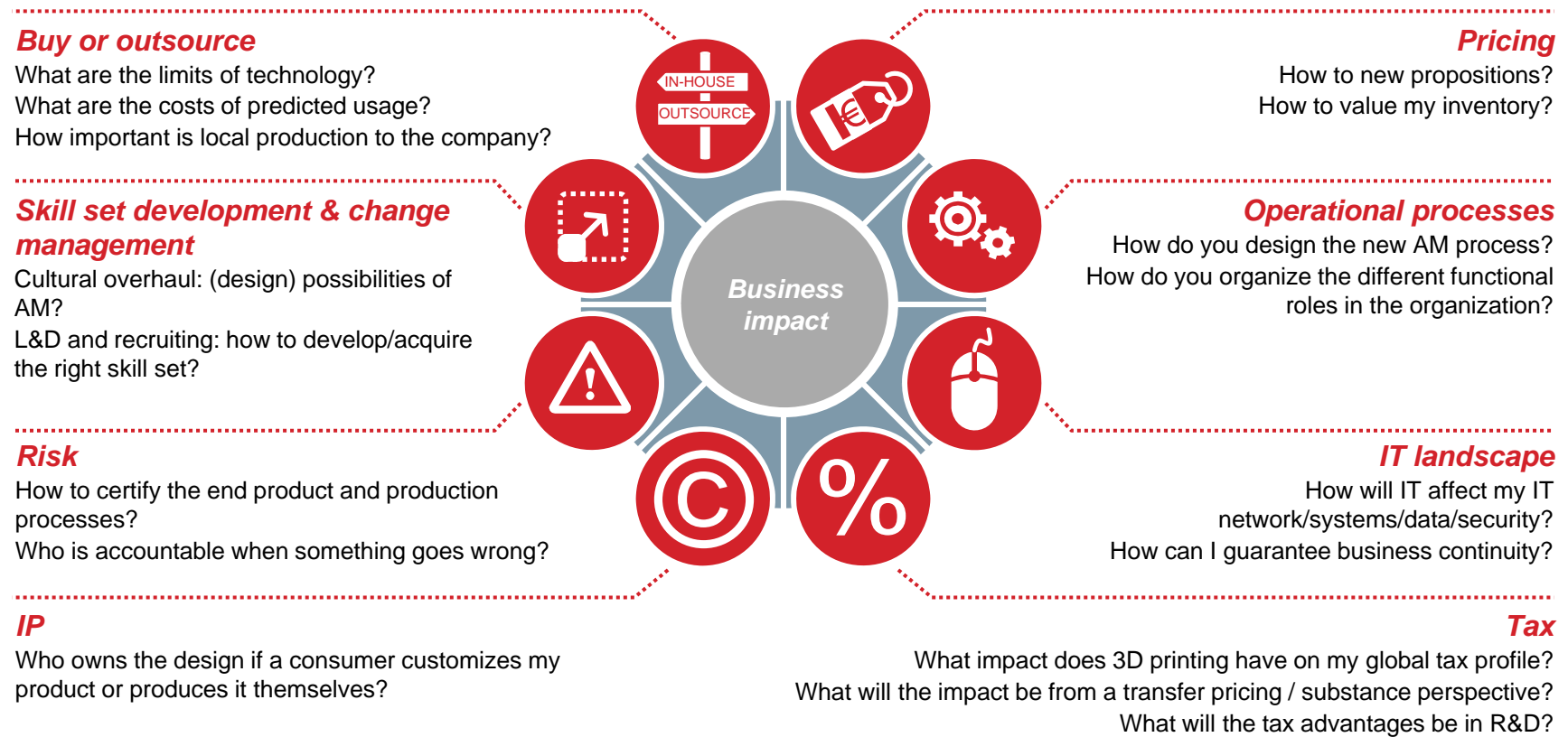


Four main reasons for using additive manufacturing:

- **Co-creation:** Supply small batches to test demand and get customer insights.
- **Extreme customization:** Cost effective personalization of products (e.g. country specific parts).
- **On demand, timely and local production:** Offer near- or on-shore printed products instead of deliveries from regional/ central warehouses. For exporting Swiss SMEs, this means that flexible production close to the customer are made possible.
- **Extend lifetime value:** Combine standard product with printable consumable parts to extend lifetime.

## Additive manufacturing – 2/2

### Implementing AM strategy will impact SMEs' operating model on several dimensions



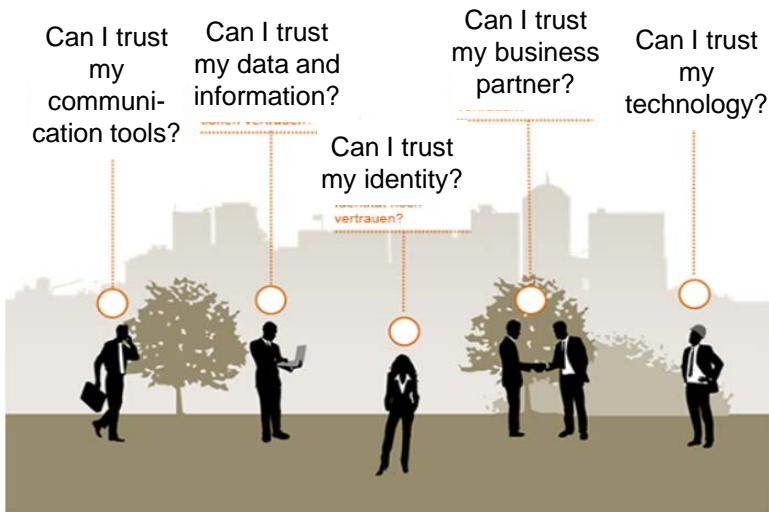
- What: Additive manufacturing opens up the possibility to co-create with customers, which will reduce time-to-market for new products dramatically.
- What: Additive manufacturing enables near- and on-shore production (e.g. spare parts for maintenance) or highly customized products for end customers. I.e., the Port of Rotterdam has developed a vision of creating an industrial print hub in the harbour.
- How: Innovation is at the heart of Swiss SMEs, therefore start with new product development and how 3D-printing could shorten your time to market, creating new, complex product design at lower cost in the after-market.

## Building digital trust

Swiss SMEs have to identify and protect their enterprise and customer data

### Digital Trust vs Cyber Crime

Digital ecosystems and broad use of data also raises important issues around cyber security. More touchpoints where data is collected and exchanged also means more potential points of entry for an attacker



### What's most at risk?



Third party connections



Industrial Control Systems (SCADA)



Emerging technologies



Executive travel



Automation



Health and safety records



Information and communication technology and data

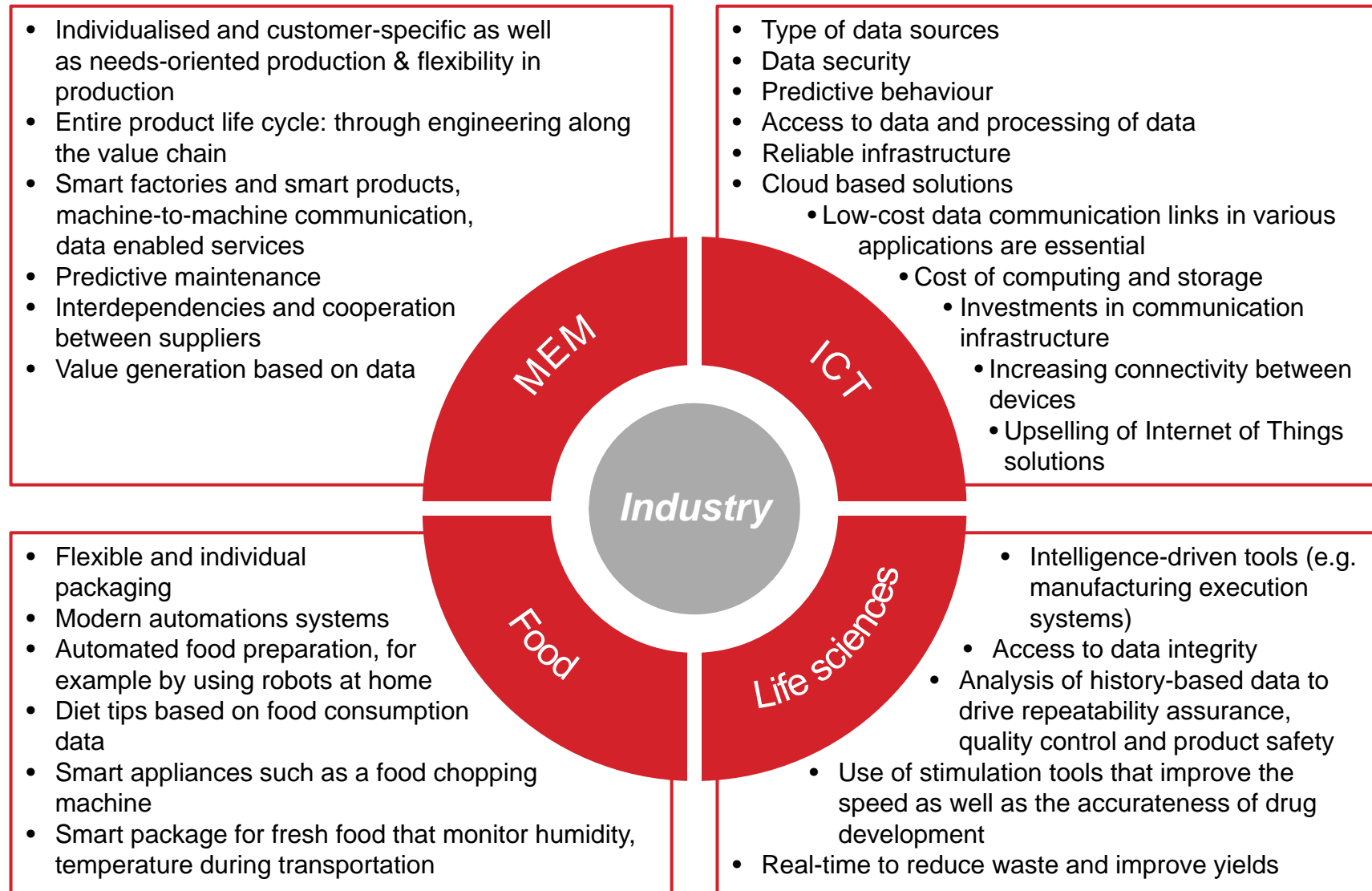


Geological surveys and industrial design (Intellectual Property)

- What: The rapidly growing number of sensors, embedded systems and connected devices as well as the increasing horizontal and vertical networking of value chains result in a huge continuous data flow.
- How: Identify your most valuable information assets, align your cyber security strategy with business objectives and get funding; Reduce, avoid or transfer unacceptable risks.
- How: Select applicable cyber threat scenarios and analyze impact to your business and customer data. Analyze current safeguards and their effectiveness, assess vulnerabilities in your infrastructure and supply chain.

## Industry 4.0 – key considerations in selected Swiss exporting industries

Drivers for the fourth industrial revolution are different



## Industry 4.0 – key considerations for exporting Swiss SMEs (1/2)

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### 01

Industry 4.0 was branded a hype due to the intense promotion in the market, now it has arrived as a reality. However, the industrial Internet is not an end in itself.

Investment plans are extremely ambitious. Early investors are already moving ahead.

It is closely tied to clear economic objectives and holds the potential for clearer differentiation in global competition.

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### 02

Industry 4.0 strategies can be developed along the three major digitization directions:

- Digitization and integration of vertical and horizontal value chains;
- Digitization of product and service offerings;
- Innovative digital business models.

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### 03

Companies expect to reduce costs by an average of 4% per year through 2020 - and to increase revenues at the same time. Companies no longer need to choose between focusing on their top or bottom line. They can improve both at the same time.

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### 04

Industry 4.0 will drive change across the entire business and trigger significant disruption. But to win, companies will need to develop a strong digital culture and have change driven by clear leadership from the C-suite.

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### 05

Customers will be at the centre of the changes to value chains, products and services. Winning companies will need to own the platform and analytics to control access to their customer.

## Industry 4.0 – key considerations for exporting Swiss SMEs (2/2)

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### 06

Data analysis will be the necessary pre-requisite for the successful implementation of Industry 4.0. Advanced in-house capabilities will be a critical competitive advantage. The brains and intellectual properties need to be in-house.

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### 07

Both developed and developing markets stand to gain dramatically from Industry 4.0.

Regional expectations are very different and yet they are all part of the same system.

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### 08

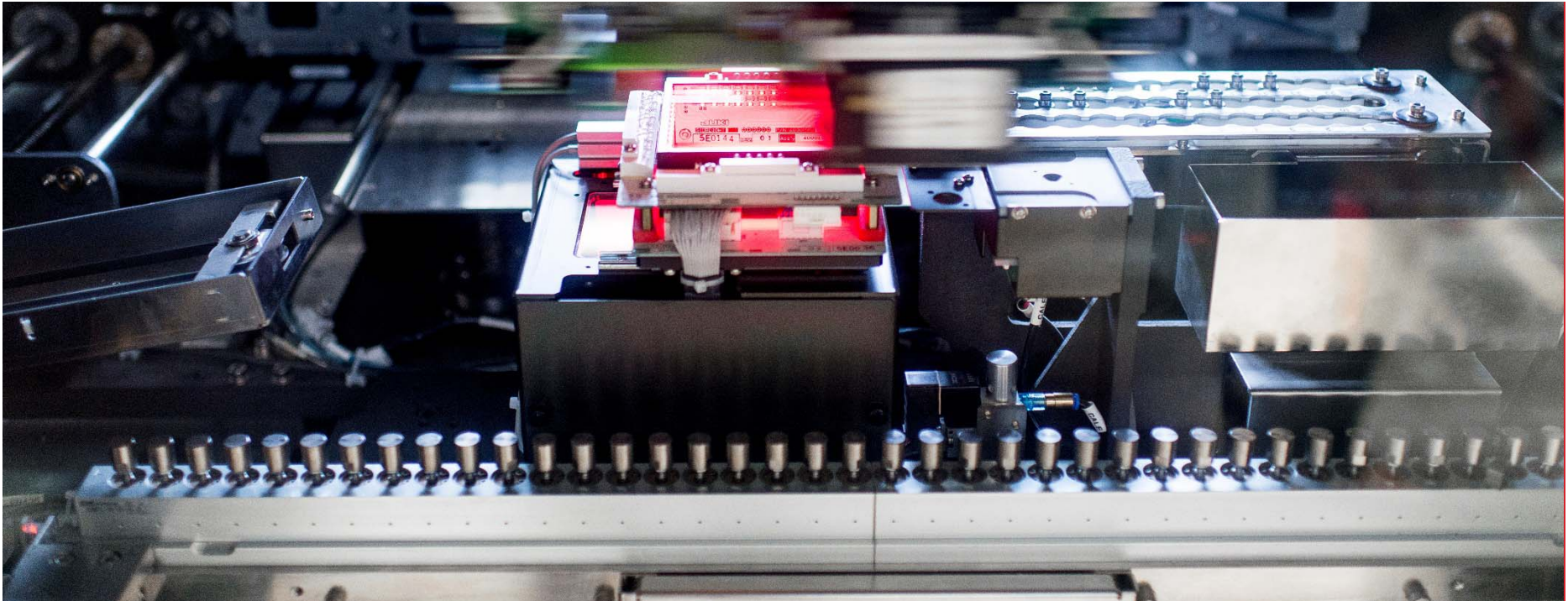
Integrated solutions or value added services are characterized by significantly higher customer benefits and will revolutionize existing product portfolios and performance relationships. Whoever owns the platform thus owns the customer, owns access to the customer, and ends up aggregating the work of a lot of other enterprises.

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### 09

Seven success factors are key to enabling a digital strategy and implementing a transformation process:

- Focus on opportunities that draw on your unique organizational capabilities;
- Extend customer value propositions by putting data at the centre;
- Look outside the organization and avoid going the way alone;
- Nurture digital capabilities via selective centralisation of activities;
- Assess your Industry 4.0 maturity and position within your end-to-end value chain;
- Provide financial and governance freedom for new businesses to grow;
- Cultivate new behaviours; agile, transversal and open.



# CASE STUDIES

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*“Industry 4.0 counteracts the relocation of jobs to low-income countries and enables even older employees to work in the manufacturing industry”*

Developer at manufacturer of automation solutions



## Case 1 – ABB process automation

### Digital asset management – collaborative data analytics for process automation



#### Company Profile

- Revenue 2015: \$35.5b
- 135,000 employees
- Present in 100 countries globally
- Leading global technology company in power and automation

#### Challenge/ Vision

How to manage customized large amounts of industrial data to:

- Improve performance of customers while lowering environmental impact
- Flexible productions in larger consolidated plants
- More insights into plant performance
- Reliable and secure data analytics with high capacity

#### Industry 4.0 Solution

- ABB Decathlon Services™ and ServicePort™ are solutions for automated & real-time process analytics



- Measurement and optimization of all process steps and parameters
- Collaborative work between various departments of organization
- Data integrated from different data sources (DCS, MES, ERP, etc.)
- Heuristics for production planning
- Secure online availability of all data and analytics results

#### Added Value

- Availability of all data for analytics, search and analytics on all data
- Low introduction burden and easy to get started
- Trends identification to mitigate equipment and process issues (predictive maintenance)
- Reduced response time and travel expenses
- Minimized risk of system upsets
- Support compliance to (new) standards, i.e. ISO 50001, ISA-18.2, ISO, etc.
- Managed data complexity
- Easy expansion of solution on demand
- Highly customizable and tangible for individual demands

## Case 2 – Schindler Switzerland

### How to achieve customer centricity with new easy to use applications (APP)



#### Schindler

##### Group Profile

- Revenue 2015: CHF 9,361 Mio.
- Approx. 58'000 employees
- Global market player of mobility solutions such as elevators and escalators

##### Challenge/ Vision

How to reduce complexity for customers in the configuration process of elevators:

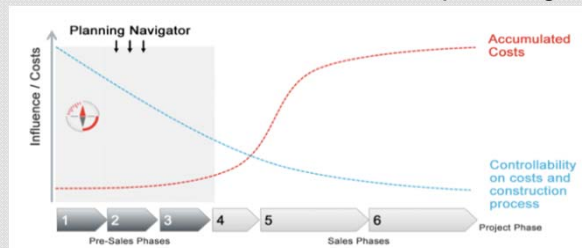
- Extensive product portfolio
- Highly complex elevator products
- Missing or outdated planning data
- Reduce time needed for sales consultation by 50%
- Find suitable product in max. 4 steps

##### Industry 4.0 Solution

- The Planning Navigator (APP) tool provides architects and planners an easy access to the elevator products of Schindler



- Finding the optimal planning data for elevators is now done in just four steps and saves time for the actual planning



- The tool helps Schindler to position their brand in the customers' decision phase (pre-sales phases).
- The user friendly tool is not only used by the target groups but also by Schindler's sales consultants

##### Added Value

- Planning Navigator piloted in Switzerland and will be adapted to global markets
- Planning Navigator is a highly useful information source and indicator for Schindler as well as the architects and planners
- Schindler positioned itself as a customer-oriented manufacturer and their contact starts early in the customer's decision phase, giving a real competitive advantage
- In addition, the customer relationship management is improved because the customers are better prepared for the consultation with the sales engineer from Schindler
- Time savings for sales engineers result in cost savings in the six-digit range within the first three years

## Case 3 – Kistler

### Digital business model– smart Systems for Smart Factories

# KISTLER

measure. analyze. innovate.

#### Company Profile

- Revenue 2015: CHF 329m
- 1'500 FTE
- 56 locations globally
- The Kistler Group is the global market leader in dynamic measurement technology

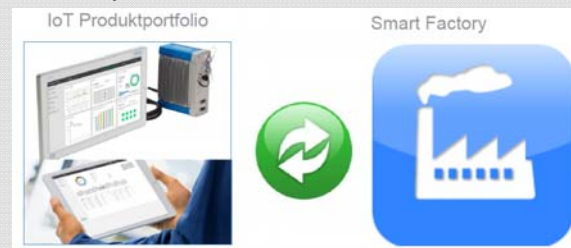
#### Challenge/ Vision

- Kistler is following an evolutionary IoT-strategy from a component and system provider to an integrated solution provider
- Kistler shares the vision of a smart factory with many of their customers, therefore we drive forward the smart factory vision with innovative solutions

#### Industry 4.0 Solution

In the smart factory of the future, production resources such as manufacturing and assembly systems will control and optimize themselves to suit demand:

- Vertical availability & integration of all engineering, manufacturing and supply chain data
- Effective big data management and data analytics
- Individual IP address for all components and systems



- Measurement and optimization of all process steps and parameters
- Automated & real-time process analytics
- Augmented reality solutions

#### Added Value

- The goal is to offer scalable customer-specific products based on platforms which meet highest quality requirements
- Enable strong growth based on the same floor space
- Continuous reduction of waste to several factors
- Automation in one piece flow of all major process steps
- Continuous reduction of throughput time
- Increase overall efficiency
- All machines online, highly automated manufacturing and supply chain processes

## Case 4 – Walter Meier

### Adding value for customers and Walter Meier through an IoT approach



#### Company Profile

- Revenue 2015: CHF 284m
- 774 FTE
- Walter Meier is a leading provider of heating, ventilation and air conditioning systems in Switzerland

#### Challenge/ Vision

- Smart Home solutions will have a radical impact on the Business Model of HVAC providers
- Serving the end-customer with on-time and tailored maintenance and personalized information about operating data of the installed base

#### Industry 4.0 Solution and Added Value

- Walter Meier will make better use of installed base to increase revenue and sales of additional service (e.g. “sensor as a service” - providing data to customers)
- Shifting from a re-active to a pro-active service model
- Remote control and access to real-time machine data reduce cost on the service front end and enables better planning of resources

##### TODAY

Re-active Service Model  
WM involved when incident occurs



**Standard Mailings** for After Sales Services and Restoration



**Typical Service Business:**  
Service contracts with insurance and maintenance elements

Sales through installer

Initial operations

Warranty

After Sales Service

Part/ Full restoration

##### FUTURE

Pro-active Service Model  
WM ensures ongoing functionality



Installed base is pro-actively triggering service needs by sensors and analytical data  
**Individual Mailings and Offerings**



**Freemium Model:** Remote monitoring/ Remote Control/ Optimizing Smart Home elements/ Cost Savings/ Energy Consulting  
For free during warranty phase afterwards premium offering

- The end-customer gets an all-inclusive package for continuous functionality
- The end-customer profits from lower service cost and personalized services based on their installed base

## Case 5 – 3D Model

Collaboration between suppliers of new production technology and SMEs pays off

### 3D M 3D-MODEL

#### Company Profile

- Revenue 2015: \$ 2.5m
- 3 employees
- Present in Switzerland
- Additive manufacturing solutions with sales, trainings and service

#### Challenge/ Vision

- Reinventing/transforming supply chains
- Increase customers' competitive advantages
- Lucrative production from batch size 1, with highest flexibility
- Freedom in design of highly complex geometries
- Qualification of additive manufactured parts
- Decentralized production

#### Industry 4.0 Solution

- Design-freedom for best functionality, not for manufacturing limitations
- Download of CAD Files instead of shipping goods around the world
- Just in time production on a local level



#### Added Value

- Small and medium sized companies have the chance through additive manufacturing to produce industrial highly complex parts within one machine, rather than a full factory of equipment and suppliers
- Continuous reduction of material usage through additive and not subtractive manufacturing and part performance efficiency through geometric freedom, such as bionic structures
- Combining built elements in one manufacturing process instead of assembling and toolmaking steps
- Shorter production cycles and production on demand, starting at batch size 1

## Case 6 – Bossard - Ergon

### Improve operational efficiency and productivity for global manufacturers

# BOSSARD

Proven Productivity

#### Company Profile

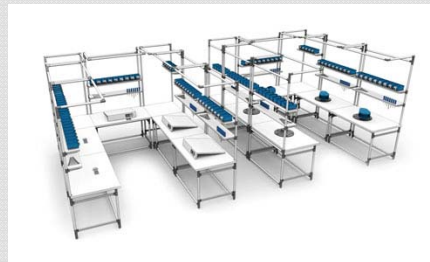
- Net Sales 2015: CHF 656m (Bossard)
- 2000 employees, 70 locations worldwide
- Leading international supplier of product solutions and services for industrial fastener and assembly technology

#### Challenge/ Vision

- Bossard enables its customers to become the best possible smart factory so that they can extend their lead in the market and position their company, their brand, and their products ahead of their competition

#### Industry 4.0 Solution

- Merging the business intelligence to one multi-device “smart factory” platform
- End-to-end process digitalization without media discontinuities
- Last mile management: support the flow of goods from supplier to point of use



#### Outlook:

- “No interface is the best interface”
- Data mining and machine learning (e.g. for weight and order data), therefore further optimization of flow of goods
- Cloud-enabled tools for customers (self-care services)
- Intelligent systems monitoring including automated optimization

# ergon

Engineering Partner Ergon Informatik AG

#### Added Value

- **Increased agility** and better supply chain responsiveness through automated recognition of manufacturing demand fluctuation
- **Improved predictability** and efficiency through data analysis
- **Leaner process** through highest availability and lowest order management, material handling and inventory holding cost
- **Maximum flexibility** through ability to suit different manufacturing environments and production set ups
- **Proven productivity:** provide expertise and new offerings for continuous and sustainable productivity improvement based on big data



# KEY SUCCESS FACTORS

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*“We already have many digital initiatives in our company – but not a shared vision and roadmap in terms of where we want to go with Industry 4.0”*

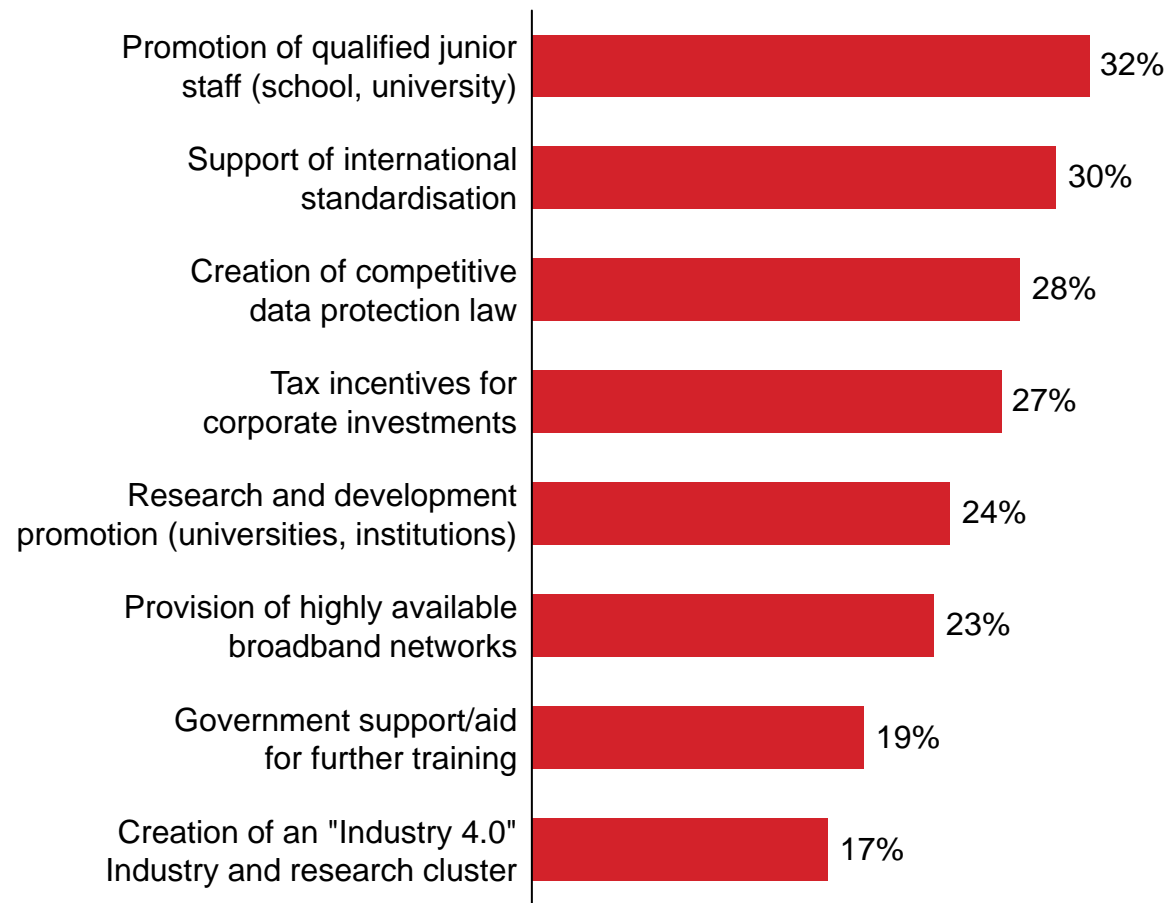
CEO of machine and plant engineer

# The role of Switzerland within the fourth industrial revolution

## Exporting SMEs have the potential to benefit from Industry 4.0 and strengthen our economy

### Need for support by policy-makers

Selection of the top 2 reasons (percentages)

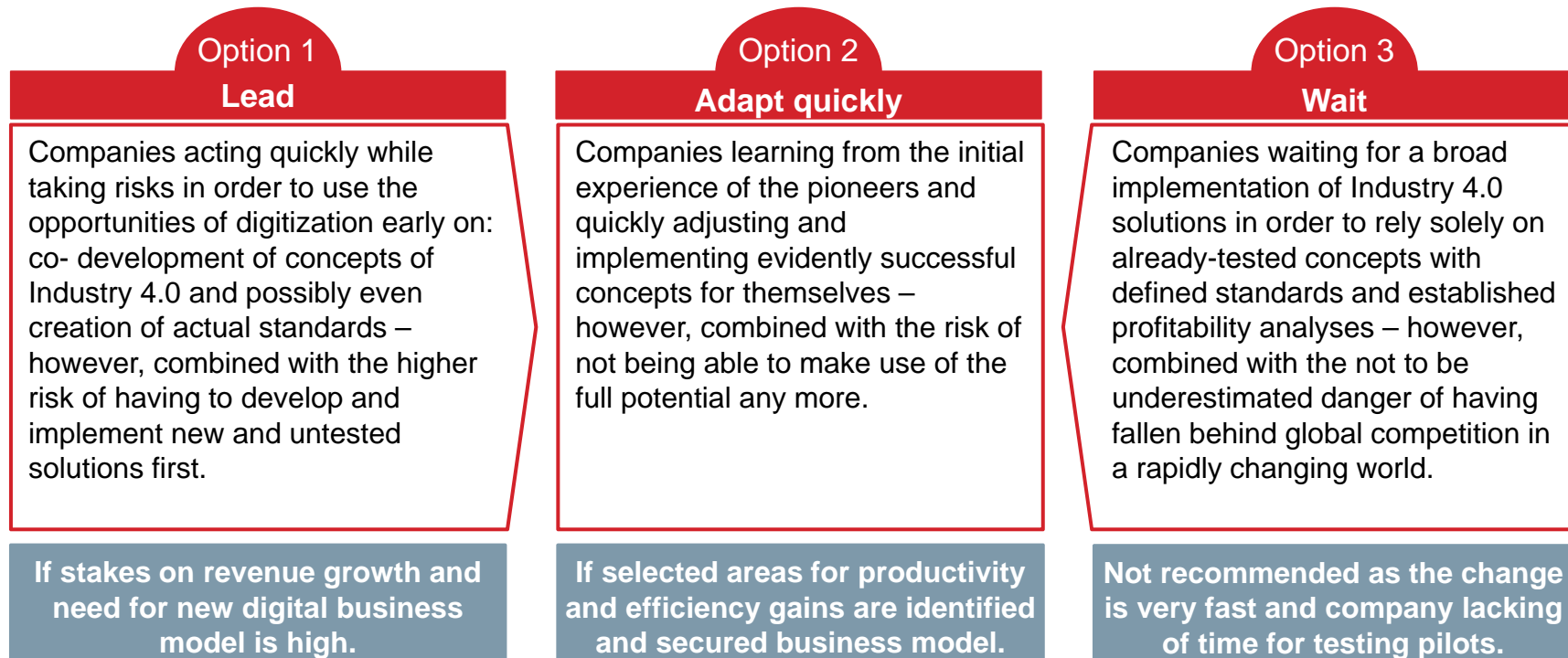


The success of exporting Swiss companies is based on innovation, productivity and high value added offerings – this becomes even more important with Industry 4.0 and is based on:

- Switzerland's high level of education and stable political system.
- High standards and requirements on data protection.
- Good balance between big, global industrial players and a strong SME segment.
- High Swiss Franc drives the development of new capabilities and digital business models.
- Swiss government is heavily investing and supporting the innovation place Switzerland.



## Exporting Swiss SMEs choose their Industry 4.0 strategy based on their individual starting point – three different approaches



- What: The global industrial footprint has changed dramatically and the term of “de-industrialization” is also being used in Switzerland. But there is a compelling case for Switzerland to develop its local Industry 4.0 Swiss MEM associations have launched the initiative “Industrie 2025” under the realm of Swissmem, the umbrella association for the Swiss MEM industry.
- What: The implementation of the industrial Internet represents a multi-year transformation process resulting in significant changes to their businesses.
- How: Start small and with a clear strategy in mind; prioritize your key investment areas to get familiar with new technologies which pays-off soon; build up your in-house capabilities on industry 4.0.

## Industry 4.0 – blueprint for Swiss exporting SMEs' digital success

### Six practical steps to lead tomorrow's competitive digital landscape

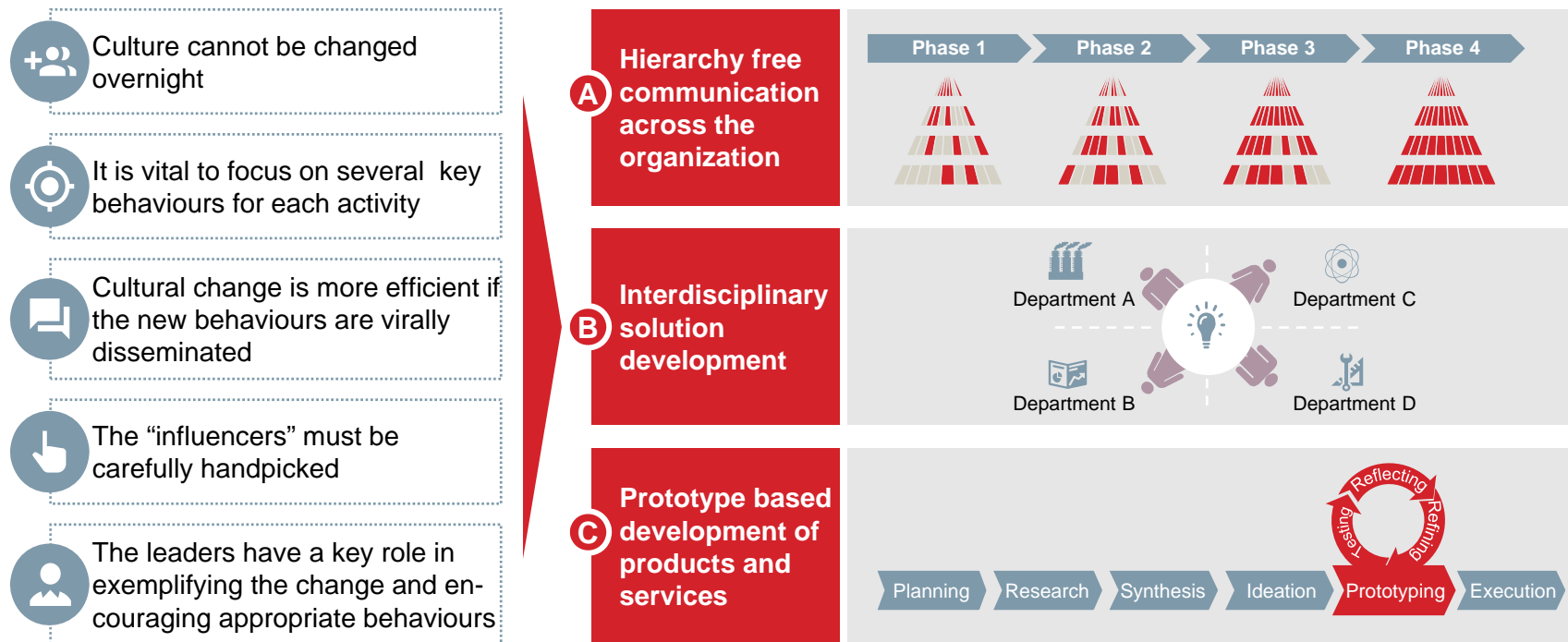


Source: PwC Strategy&

- Don't buy the hype. Buy the reality. Industry 4.0 will be a huge boom for companies that fully understand what it means for how they do business.
- Industry 4.0 often requires a company-wide transformation. Your organization has to be willing to experiment with new technologies and learn new ways of operating.
- Take the time to consider what you could gain by collaborating with customers, suppliers, technology partners and even competitors, without limiting your vision based on current constraints.

# Industry 4.0 – building a culture for the Digital Enterprise

## Swiss SMEs need to focus on people and culture to drive the transformation process



- How: Balance development of existing internal talents with the need to recruit external talents to install a digital culture.
- How: Build a differentiated positioning and a digital brand image to attract the youngest and tech-savvy generations.
- How: Acquire companies to integrate quickly their technologies and key digital skills.
- How: Collaborate with institutions, i.e., Innovation Switzerland, to get a kick-start and quick wins from outside-in experience.

## Industry 4.0 – do you know the maturity of your organization in the key areas for success?

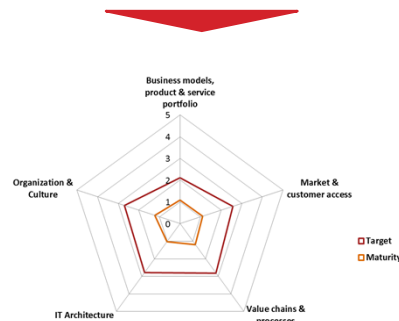
	① Digital novice	② Vertical integrator	③ Horizontal collaborator	④ Digital champion
models, product & service	<i>How is the mix of physical products and services in the portfolio? Which digital features or services are offered? To which degree is engineering already digitised?</i>			
Market & customer access	<i>Which channels are used for customer interactions? Which data is currently measured to understand customers? How are all customer interactions tracked?</i>			
Value chains, processes	<i>To which extent is manufacturing integrated with engineering internally? How is the supply chain managed? How are manufacturing capacities planned?</i>			
IT Architecture	<i>How are processes supported by digital technologies? What are the technical capabilities? How does IT infrastructure support digital services?</i>			
Compliance, legal, risk, security & tax	<i>How is compliance assured and technically implemented? How are legal risks addressed? Are tax opportunities realized? How is cyber trust ensured?</i>			
organization & culture	<i>What is the organization's ability to change? Which Industry 4.0 related capabilities are available within the organization?</i>			

- The **digital novice** has just started the digitization of his business model and operations and the main focus is on getting internal integration started.
- The **vertical integrator** already added digital features to his products and/or digital products and services to his portfolio.

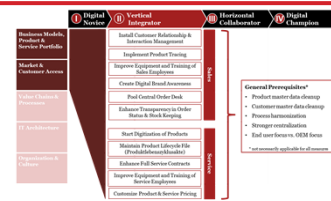
# PwC's Industry 4.0 maturity assessment – developing towards your target state and creating your individual Industry 4.0 roadmap

## 1 Analysis of Industry 4.0 status quo and vision

- Interviews with the leadership team
- Capture of status quo and target state regarding selected dimensions in the context of Industry 4.0
- Analysis and visualisation of the results



## 2 Derivation and discussion of measures

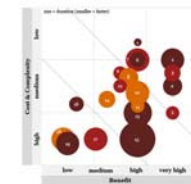


- Gap analysis for identification of existing and future capabilities and technologies for reaching the target state
- Derivation and detailing of 19 measures to develop towards the target state

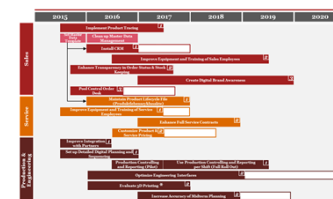
Measure	Priority	Benefit	Cost	Complexity	Overall Feasibility	Impl. Timeframe
Maintain Product Lifecycle File (Produktlebenszyklusakte)	1	High	Medium	Medium (to high)	High	3y
Improve Equipment & Training of Service Employees	1	High (to medium)	Low to medium	Medium	High	2y to 3y
Enhance Full Service Contracts	2	Medium (to high)	Low to medium	High	High	2y
Customize Product and Service Pricing	2	High	Low to medium	High	Medium	1y to 2y
Start Digitization of Products	3			Not rated		

- Discussion, rating and prioritisation of the measures in 4 workshops with the client's leadership team

## 3 Development of Industry 4.0 roadmap



- Insights deepened by consideration of feasibility, prerequisites and resources in running operations
- Focus on practical opportunities with short implementation times and high business value



- Development of the Industry 4.0 Roadmap 2020

- The **horizontal collaborator** already achieved a decent level of vertical integration and now focuses on collaboration and integration with partners, customers and suppliers.
- The **digital champion** already implemented vertical and horizontal integration to a degree sensible for his business.
- Link to the online maturity assessment: <https://i40-self-assessment.pwc.de/>

# “Export Digital” Initiative by Switzerland Global Enterprise and Google Switzerland

**IHRE ERGEBNISSE**

Für Ihre Produkte weisen die unten stehenden Länder besonders hohe Nachfrage und ein günstiges Wettbewerbsumfeld auf. Wie selbst kleinste Unternehmen dies in der Praxis genutzt haben, sehen Sie in unseren [Erfolgsgeschichten](#).

Suchbegriff:  Region auswählen:  [Herunterladen](#)

Standort	Absatzchancen	Monatliche lokale Suchanfragen	Suchanfragen im zeitlichen Verlauf	Empfohlenes Gebot	Wettbewerb
+ Russische Föderation	●●●●	1.300		0,53 CHF <input type="range"/>	●●●●
+ Deutschland	●●●●	1.900		0,71 CHF <input type="range"/>	●●●●
+ Frankreich	●●●●	2.160		1,76 CHF <input type="range"/>	●●●●

Ihre erfolgreiche Wachstumsstrategie.

Zollformalitäten - was muss dabei beachtet werden.

Sicheres Exportieren - trotz fremder Finanzmärkte

Wie Sie die richtige Absicherung beim Exportieren finden.

With the help of the platform, exporting Swiss SMEs can facilitate their market research, realize online sales potential and access new export opportunities.

- “**Market finder**” tool to evaluate the product-specific online export potential of countries around the world.
- Comprehensive **e-learning platform** featuring digital know-how: 100 videos from S-GE, Google and further partners covering all questions from market entry and cultural knowledge to financing, customs duty management and digital marketing.
- Further contacts to S-GE, Google and partners (Credit Suisse, SERV, PwC, Amber Road).

[www.exportdigital.ch](http://www.exportdigital.ch)



# CONCLUSIONS FOR SMEs AND KEY TAKE AWAYS

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*“We associate Industry 4.0 with clear economic aims and the opportunity for better differentiation in global competition”*

Plant manager at Digital Factory, an electronics group

## Conclusions for Swiss SMEs

### Industry 4.0: A complete value chain transformation

- When implementing Industry 4.0 applications, companies should think hard about which pieces of the process value chain are strategic “control points,” where capabilities and data should be built and kept in-house to secure important competitive advantages, and which pieces are commodities” and handled best by partnering with a strong third-party provider.
- Ask yourself the following questions:
  - How mature are my current capabilities?
  - What could I gain by better collaboration with customers, suppliers, technology partners and even competitors?
  - How is customer behaviour changing and how does my relationship to customers need to change in response?

### Go digital: SME should rethink value proposition

- Swiss SMEs should increasingly focus their internationalization strategy on digital processes.
- Exporting SMEs need to understand changes in their consumer behaviour and orchestrate their company's role within the future ecosystem of partners, suppliers and customers.

### Switzerland has best chance to be a digital winner

- Moving from the current to the future desired state will need precise steps and a clear prioritization.
- Swiss SMEs that become a “digital champion” embark on a journey that starts small but ends ultimately in a transformation of the core business.
- Swiss SMEs should actively plan a „digital ecosystem“ approach. In the earlier stages, use partnerships or align with platforms if you cannot develop a complete offering internally.
- Companies will benefit from the excellent Swiss education system and digital infrastructure.
- Switzerland has ideal conditions to play a leading position in innovative, internet-based production technology and service provision.

### All Swiss export sectors are concerned

- Not all sectors are impacted in the same way of industry 4.0, but cyber-physical production systems will change the way firms develop, manufacture and distribute goods and services to the customer in all sectors. Popular online retail services that currently combine digital marketplaces, online payment and advanced logistics infrastructure offer just a glimpse of the hybrid services to come.



## Key Success Factors for Industry 4.0

- 1 Start with the people**
  - Management should name a responsible person/team for the digital transformation.
  - Management commitment and training/education is absolutely key.
- 2 Begin digitizing, step by step**
  - Start with first digital processes to learn and adopt change.
  - Combine technology strategy with your business model and resources.
- 3 Learn from your clients and peers**
  - Focus your key clients' changing needs in your digital transformation process.
  - Listen and learn from your clients and best peers in your industry.
- 4 Collaborate and share best practise**
  - Don't underestimate the power of working together, build a strong ecosystem with partners.
  - Share experience and best practice and learn from digital markets.
  - Use social media, online communities and online channels to promote your products or services.
- 5 Don't wait, act now**
  - New disruptive business models can change clients needs very fast.
  - Do your homework and digital assessment now

### S-GE offerings

- Workshops for the development or focusing of your internationalisation strategy - in general, for a region or a country.
- Individual and free-of-charge consultation meetings to discuss your specific questions.
- Independent and neutral consultation of your plans.
- Research, market information as well as business partner screening.
- Various events giving insights into market and industry trends.
- Established network in over 70 countries for your facilitated access to international markets.

 **SWITZERLAND  
GLOBAL  
ENTERPRISE**

enabling new business



# APPENDIX

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*“Beside improvements in efficiency and cost savings, Industry 4.0 also makes it possible to save important resources”*

Head of Production, machine tool manufacturer

# S-GE: further readings on Industry 4.0

S-GE's dossier page [www.s-ge.com/4IR](http://www.s-ge.com/4IR) provides you with news, videos, infographics and studies on the topic of Industry 4.0 for your international business.

## NEWS

### Industry 4.0: speed and simplicity win

April 12, 2016



"Digitization is a mega trend in the financial sector," says Francisco Fernandez, Group CEO at the fintech company Avaloq. However, he does think that Swiss technologies possess a lot of potential. [MORE...](#)

### Industry 4.0: revolution, evolution or catch-up process?

April 09, 2016



"The name Industry 2025 implies a longer, continuous transformation process for the Swiss industry. But do we really have time until 2025?", an interview with Eberhard A. Veit. [MORE...](#)

### Starmind – a Swiss contribution to Industry 4.0

April 08, 2016



What companies say about the fourth industrial revolution



## DOWNLOADS

Flyer Forum 2016 (959 KB)

## LINKS

- Forum 2016
- PwC: Industry 4.0 – Building the digital enterprise
- McKinsey: Industry 4.0 after the initial hype
- Accenture – The Growth Game Changer IoT
- Deloitte Industry 4.0
- Roland Berger – The role of Switzerland within a European manufacturing revolution (en)
- The Future of Jobs – WEF Global Challenge Insight Report
- UBS White Paper on the Fourth Industrial Revolution
- The Future of Software and Society (only in en)

## YOUR PERSONAL CONTACT

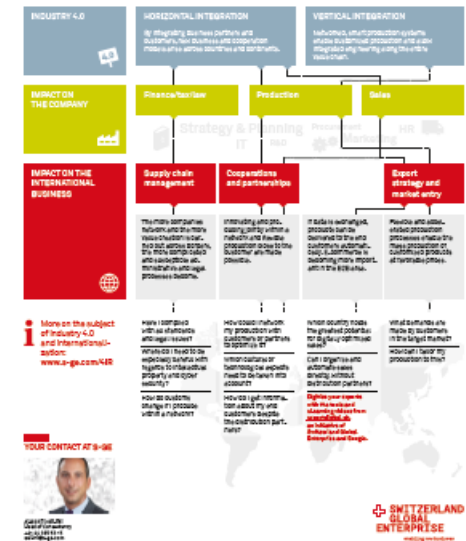


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## IMPACT OF INDUSTRY 4.0 ON INTERNATIONALIZATION

Industry 4.0, or the fourth industrial revolution, changes the entire value chain, the way companies cooperate and how they serve customers across borders. Some examples.



## PwC: further readings on Industry 4.0



PwC - [Link](#)



PwC - [Link](#)



PwC - [Link](#)



PwC - [Link](#)



PwC - [Link](#)



PwC - [Link](#)

## GET IN TOUCH!

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