Opportunities & Cooperation

Manufacturing Digitalization Powered by Industrial Internet

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1 The Rise of Digital Economy

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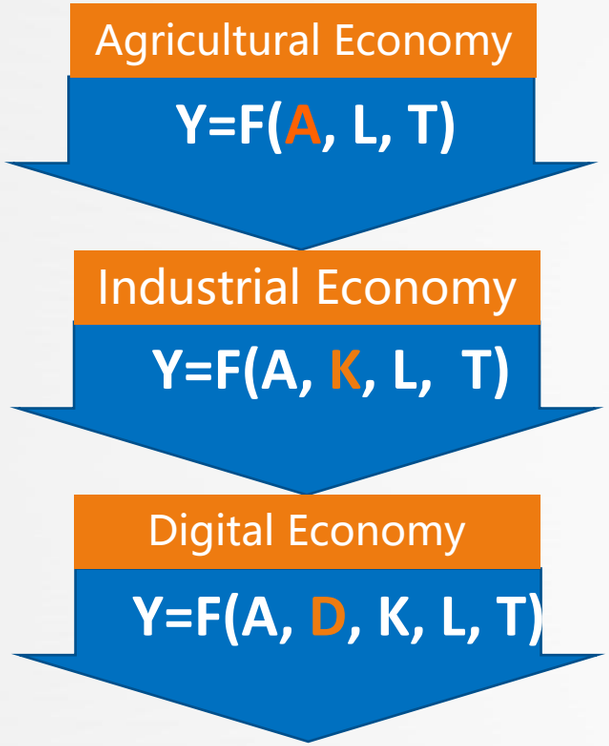
01 The Rise of Digital Economy

1 Digital Economy Is Here

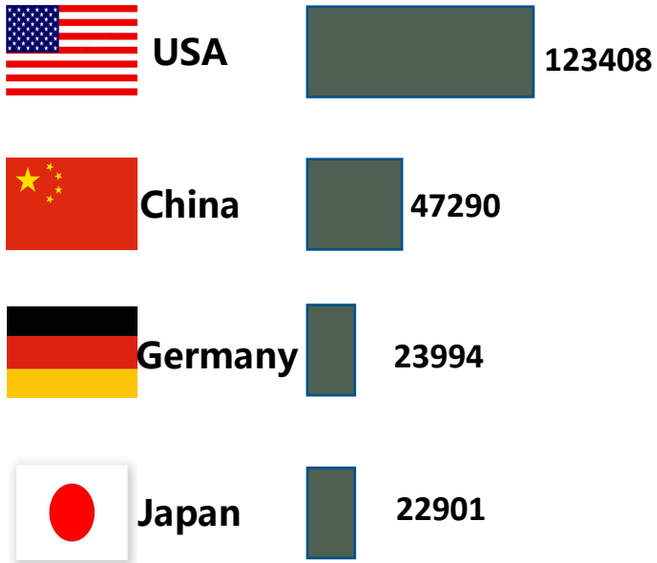


Y: Yield F: Production Function
A: Advanced technology L: Labour
T: Territory K: Capital D: Data

- Data is the new driver of economic growth.
- Data is the core asset of the future competition amony enterprises.

1 Global Industrial Digitalization is Growing

Global Digital Economy Volume

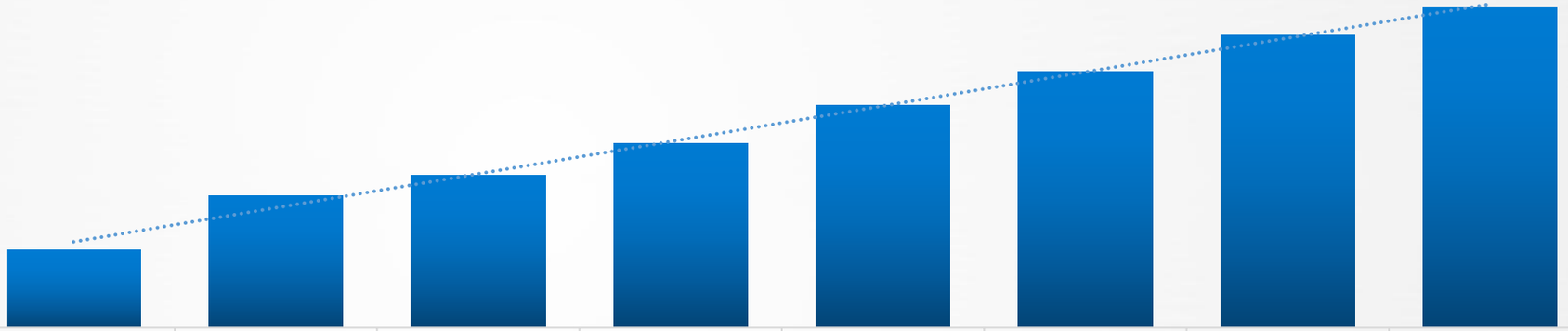


Top 20 global digital companies Forbes, 2020

Microsoft
The Walt Disney Company
SAMSUNG
amazon
Alphabet
AT&T
中国移动 China Mobile
verizon
intel
阿里巴巴 Alibaba.com
IBM
SoftBank
CISCO
Tencent 腾讯
NTT
ORACLE
tsmc 台积电
Deutsche Telekom
Tomorrow, Together KDDI

➢ Digital economy is the new opportunity of international cooperation.

1 China Leads the World in Digital Economy Growth



	2011年	2014年	2015年	2016年	2017年	2018年	2019年	2020年
Total Vol (tns of yuan)	9.49	16.16	18.63	22.58	27.2	31.3	35.8	39.2
% of GDP	20.30%	26.10%	27.50%	30.30%	32.90%	34.80%	36.20%	38.60%

15% YoY growth in the past 10 years.

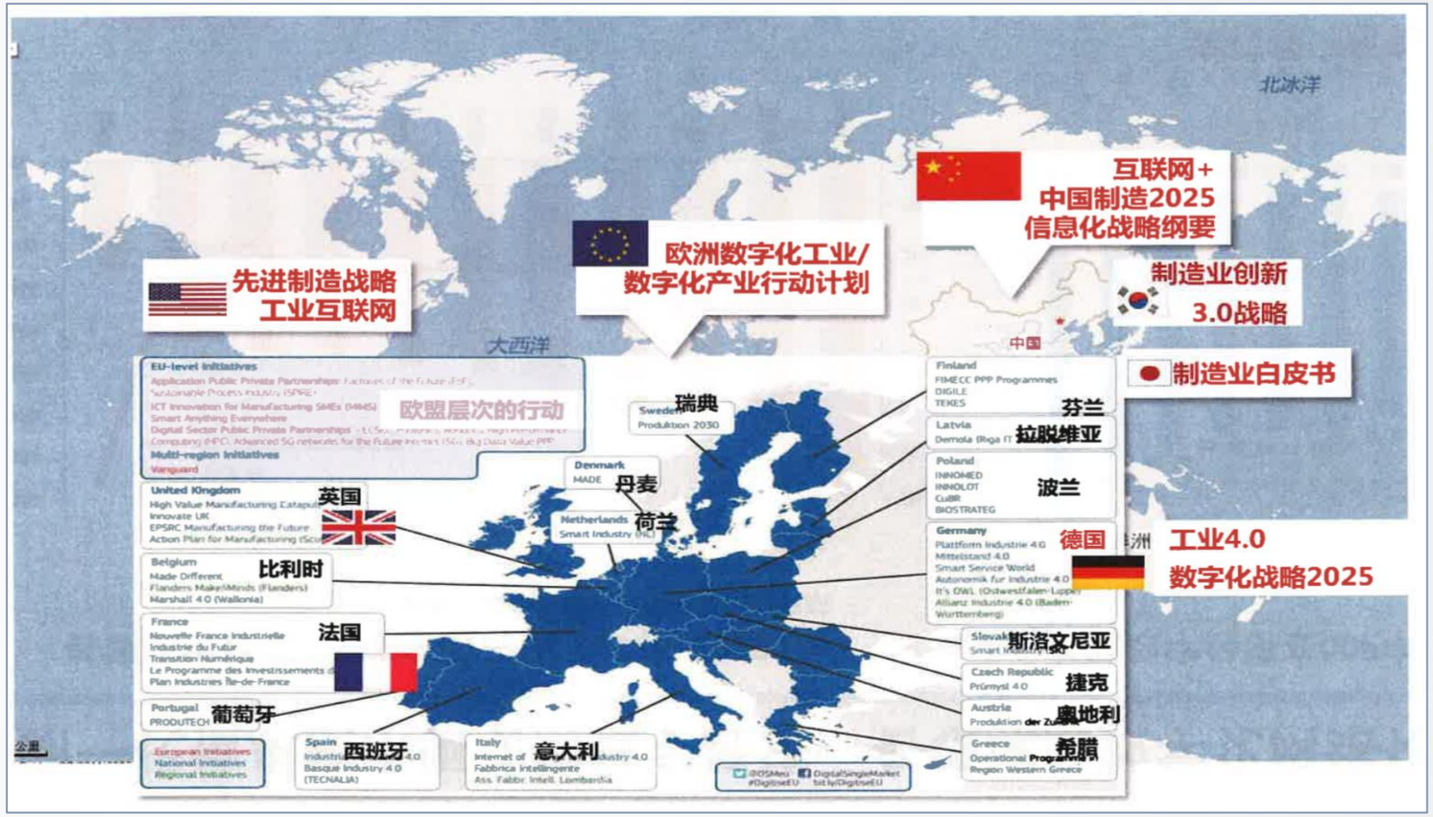
02 Manufacturing Digitalization Powered by CASICloud

2 Government Policies

- U.S. : Digital Engineering Strategy to build end-to-end digital capabilities, and the Industrial Internet is the key Factor.

- Germany National Industrial Strategy 2030 ensures the leading position of manufacturing, Industrial Internet as focus.

- China: Industrial Internet as a New Infrastructure



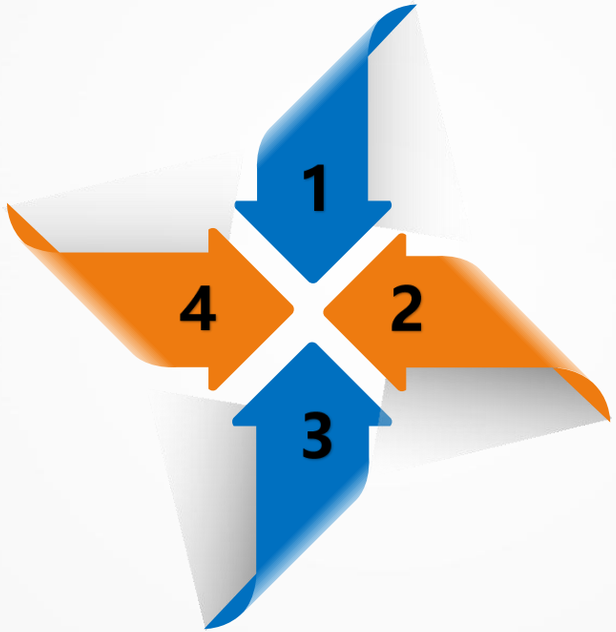
Core points of the strategies: deeply integrates information technology and manufacturing technology.

Industrial internet becomes the new engine of manufacturing transformation

2 Challenges of Digitalization

Lack of motivation among business

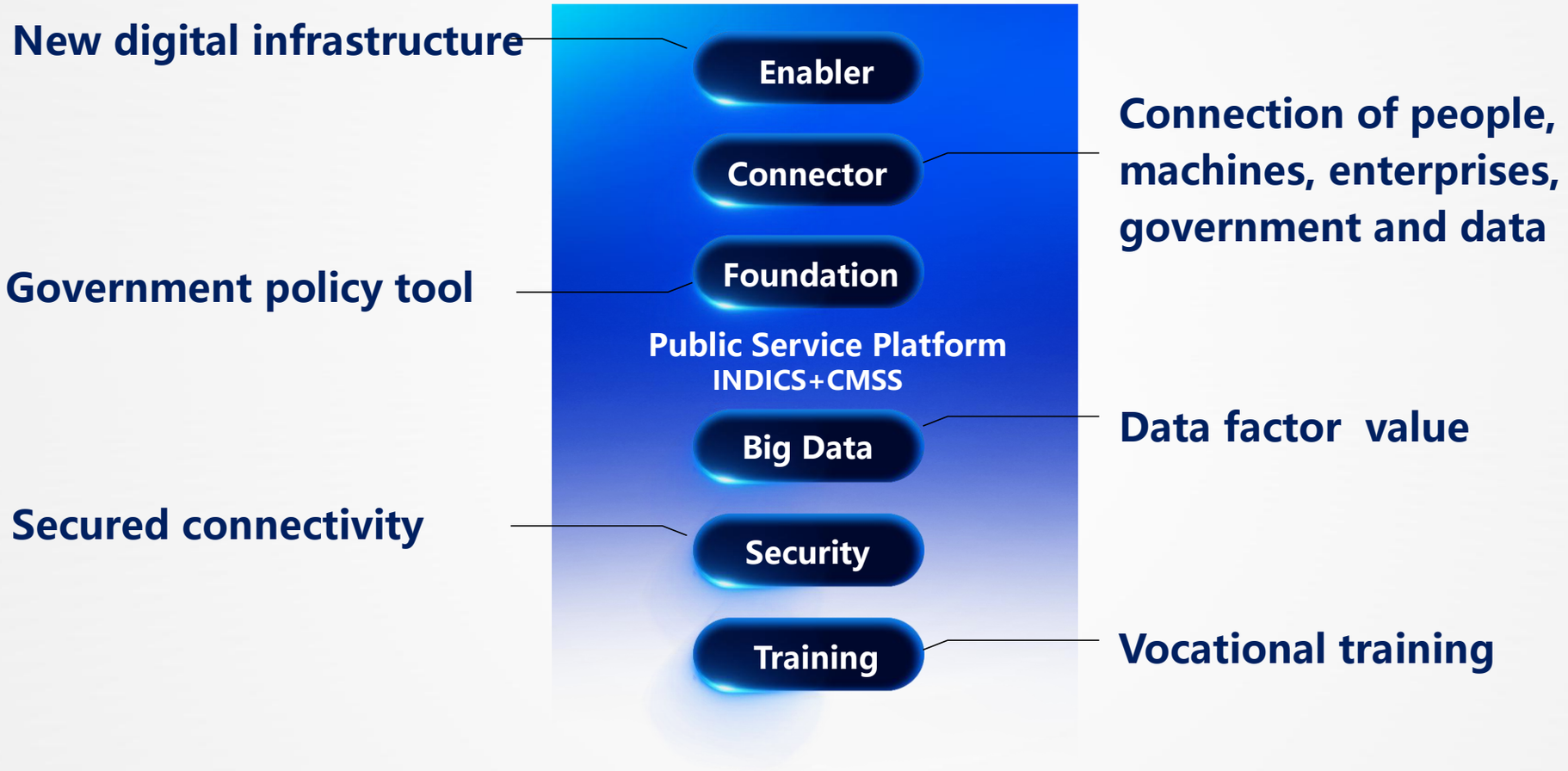
Lack of trained professionals and technical personnel



Lack of coordination between upstream and downstream enterprises in the industrial chain

Lack of digital solutions for all businesses

2 Industrial Internet is the Digital Infrastructure



2 Industrial Internet Application Scenarios

Scenarios		Use case distribution	Application results		
设备及产品管理	状态监测	80%	成本节约	降低用工量	减少故障损失
	故障诊断	29%		降低运维成本	降低能耗
	预测性维护	26%		减少资源浪费	减少安全事故
	远程运维	19%	效率提升	优化业务流程	减少故障损失
业务和运营优化	生产制造优化	37%		提高资源（设备、物料）利用效率	缩短交付周期
	资源调度优化	17%		提高员工工作效率	提高供应链运作效率
	能耗优化	16%	产品与服务提升	缩短研发周期	降低次品率
	质量优化	12%		降低产品故障率	产品可追溯
	安全管理	8%		加速产品/服务更新迭代	提升客户满意度
	设计优化	8%	业务和模式创新	带动投资	数据即服务
	库存优化	5%		增加客户生命周期价值	增加客户数量和范围
	物流优化	5%		新的市场营销策略	新商业模式获得的收入增长
	知识管理	4%			
	员工赋能/作业指导	4%			
	采购/销售决策优化	3%			
新模式新业态	数字化产品	6%			
	产品即服务转型	6%			
	按需制造	3%			
	分享制造	3%			
	协同制造	2%			
	创新定价模式	2%			
	产融合作创新	1%			
	网络化协同研发	1%			

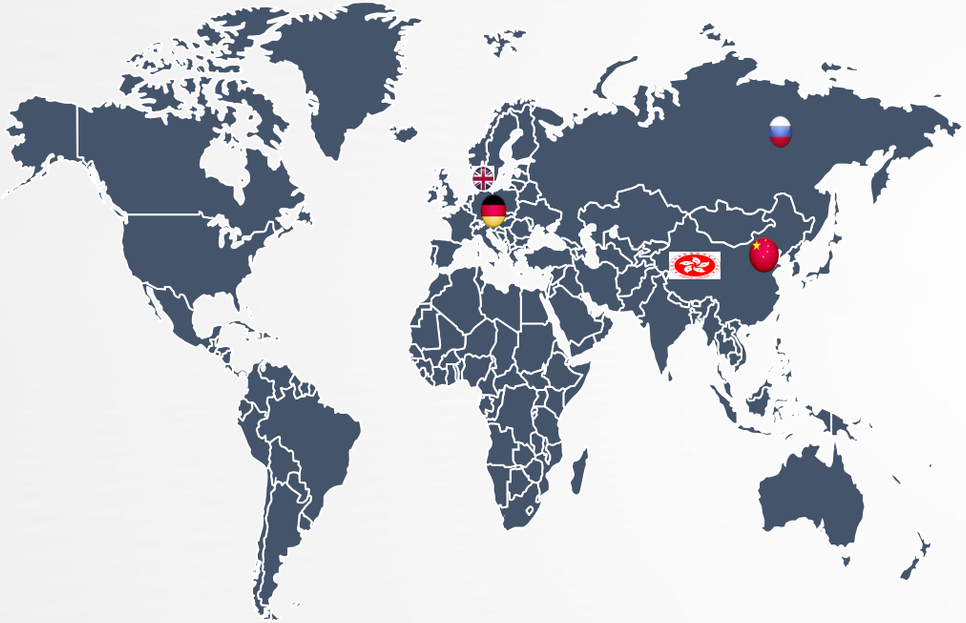
2 CASICloud: 1st Industrial Internet Company in China

- Founded in 2015 as the first industrial internet platform in China.
- National industrial internet platform
  - 22 provincial level industial internet platforms
  - 13 vertical and park platforms covering 4 industries including Machinery manufacturing, aerospace, automotive, electronics
  - 2000 intelligent projects and services.
- National Engineering Laboratory of Industrial Big Data application
- Extensive international cooperation: Siemens, SAP, FESTO, APEC

2 航天云网工业互联网发展路径

Deployment in Germany

Europe and North Africa



China Domestic ecosystem

domestic and international collabration

China • Hongkong

Main platform launched for international business

Asia Pacific, ASEAN and "One belt, one road" area

2 CASICloud Platforms

INDICS+CMSS
Built the industrial internet based cloud manufacturing industrial eco-system

Compatible:
Intelligent manufacturing、Collaborative manufacturing and cloud manufacturing

Service:
Innovation of technology,business mode and management

2 CASICloud Operating System

INDICS-OS is a distributed industrial operating system based on cloud

System Integrater

Industrial Enterprise

Eco-system Partner

Developer support

Data Mangement

Equipment and System Connectivity

- **Downward: improve the ability of equipment resource connectivity service.**
- **Upward: support the development and operation of industrial application of new generation**

03 CASICloud Case Studies

3 Case Study: 5G+ Industrial Internet

Remote maintenance of heat treatment plant based on "5G+VR+digital twin"

Issues

- ✓ Poor process stability
- ✓ High scrap rate of finished products
- ✓ High operational security risk

Key Features

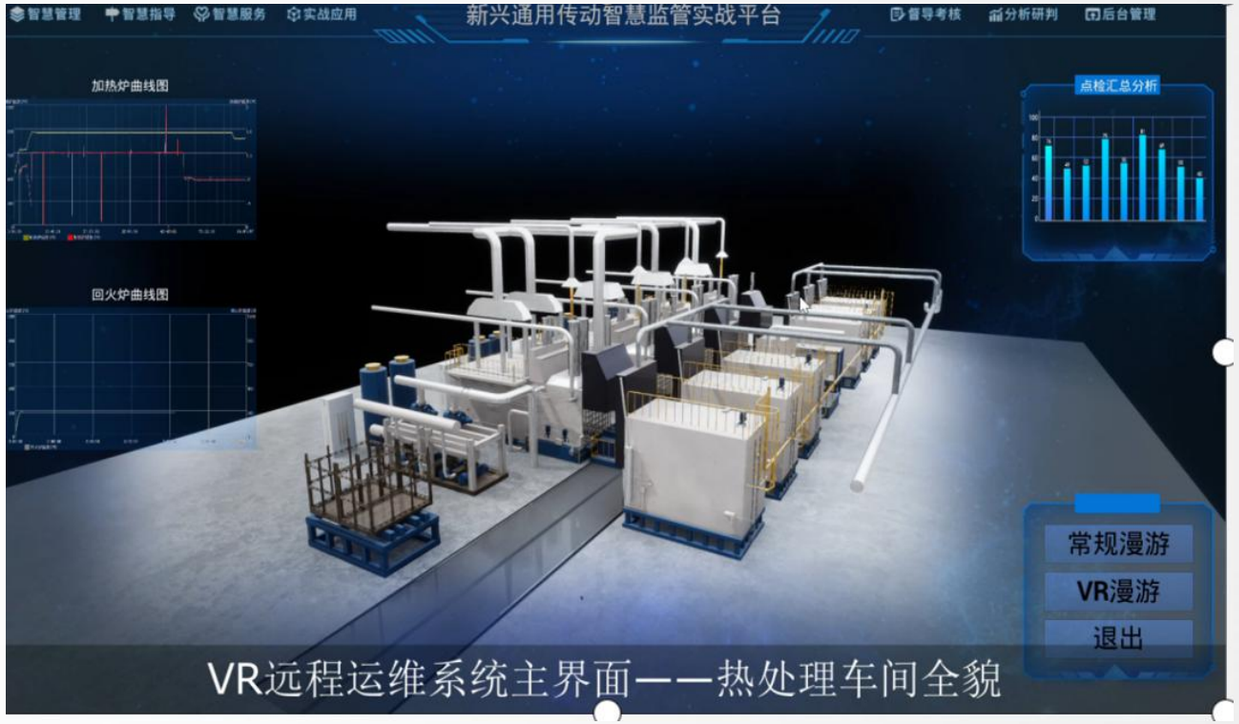
- ✓ Optimize the heat treatment process
- ✓ Improve product quality and safety
- ✓ New mode of remote maintenance

- ■ 500 data collection points; 20 key indicators, such as, temperature, gas concentration, temperature and carbon concentration.
- ■ **5G+VR remote inspection:** temperature field distribution, carburizing process; reduce the risk of manual operation.
- ■ **Digital twin (device level):** carbon potential prediction, adjust parameters in real time, improve process stability reduce product rejection rate.

3 Case Study: 5G+ Industrial Internet

Remote maintenance of heat treatment plant based on "5G+VR+digital twin"

Remote inspection, Digital Twin, Real-time Rendering of 3D Models, Inspection at Any Time



5G+VR realizes immersive observation in the furnace

Application Effect: efficiency ↑ 20%; Qualified products ↑ 5%; accident ↓ 95%

3 Case Study: Smart Factory

Electric Connector Smart Factory

Key Features

- Combination of virtual and real world through digital twins
- Cross-enterprise and mixed-line production manufacturing mode
- CRP intelligent scheduling plan
- Data-driven, flexible production to meet customized orders.

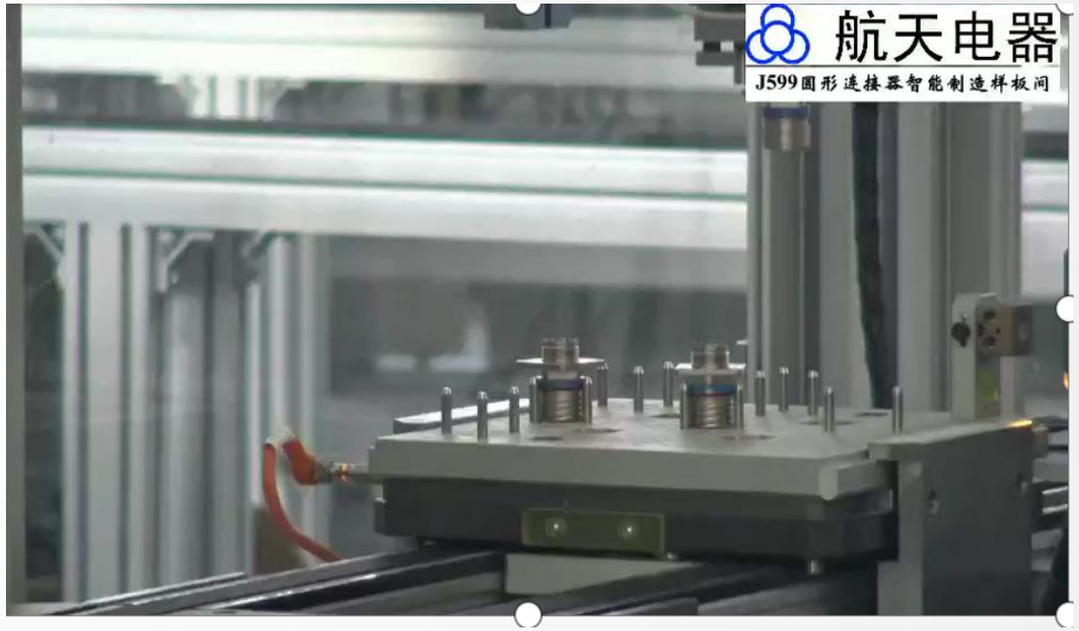
- AGV automatic distribution, logistics automation.
- Integrate robots, visual inspection systems, etc.; Flexible processing and inspection of products.
- Data collection and uploading, Intelligent production line construction.

3 Case Study: Smart Factory

Electric Connector Smart Factory

Application Results

Productivity	Operation cost	Time to market	Defect rate
+50%	−21%	−30%	−56%



Workshop workers ↓ 75%

Production cycle ↓ 66.67%

Annual production capacity 500,000 ↑ 400%

3 Case Study: Smart Workshop/Production Line

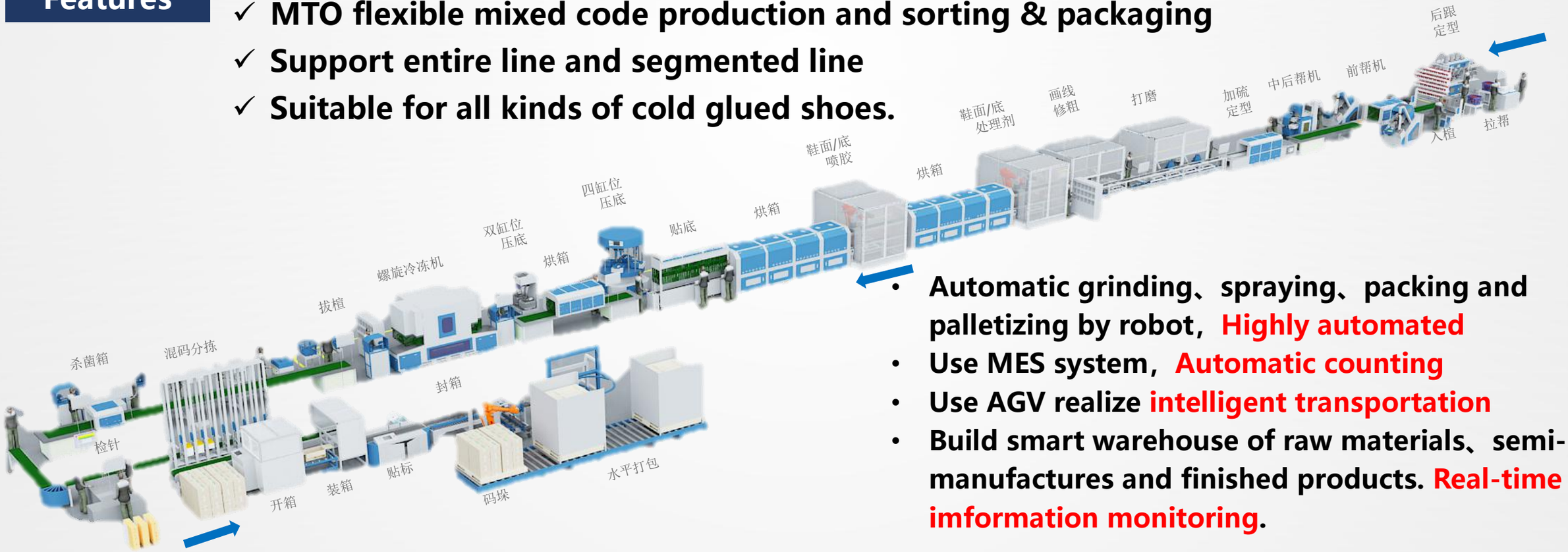
Smart Shoe Production Line

Issues

- ✓ Information transmission relies on paper documents
- ✓ Manual loading low efficiency and potential safety problem
- ✓ Production capacity of shoes, cutting and sewing machines is insufficient

Features

- ✓ MTO flexible mixed code production and sorting & packaging
- ✓ Support entire line and segmented line
- ✓ Suitable for all kinds of cold glued shoes.



- Automatic grinding、spraying、packing and palletizing by robot, **Highly automated**
- Use MES system, **Automatic counting**
- Use AGV realize **intelligent transportation**
- Build smart warehouse of raw materials、semi-manufactures and finished products. **Real-time imformation monitoring**.

3 Case Study: Smart Workshop/Production Line

Smart Shoe Production Line

Application Results

Transparent production process, Data traceability;
Productivity ↑200%, Cutting ↑30%, Sewing ↑66.7%。

04

International Innovation & Cooperation

4 New Opportunities Under New Development Pattern

Dual Circulation New development pattern

New development pattern

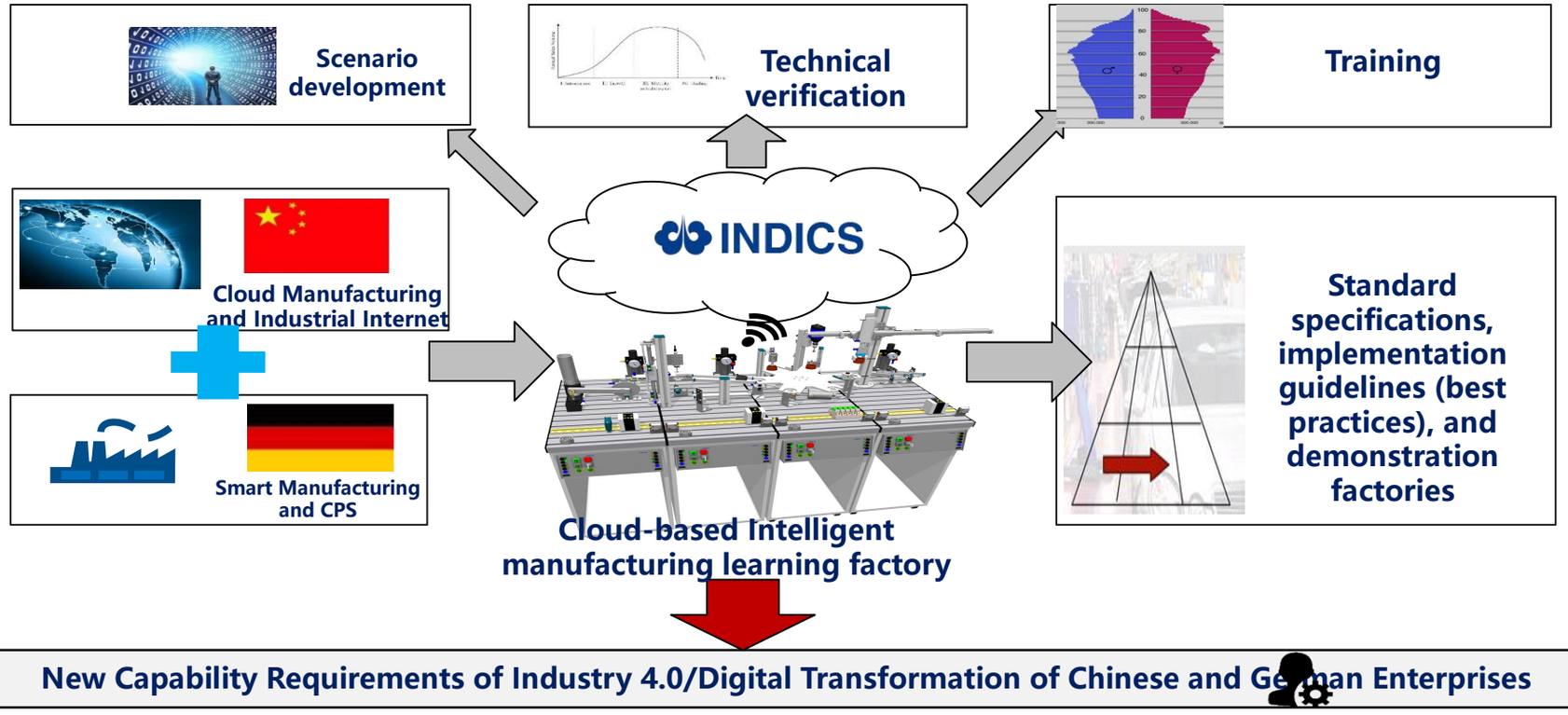
- Accelerate the formation of a new development pattern with the domestic cycle as the main body and the domestic and international Dual Circulation mutually promoting each other.
- Open door policy to a higher degree

- 21 pilot Free Trade Zones
- Industrial Internet Park
  - Transformation and upgrading of SMEs,
  - Provides online service of cross-border supply chains
  - Builds an international supply chain online ecosystem innovatively.

INDICS International Industrial Internet Platform Enabling high-quality development in pilot free trade zones

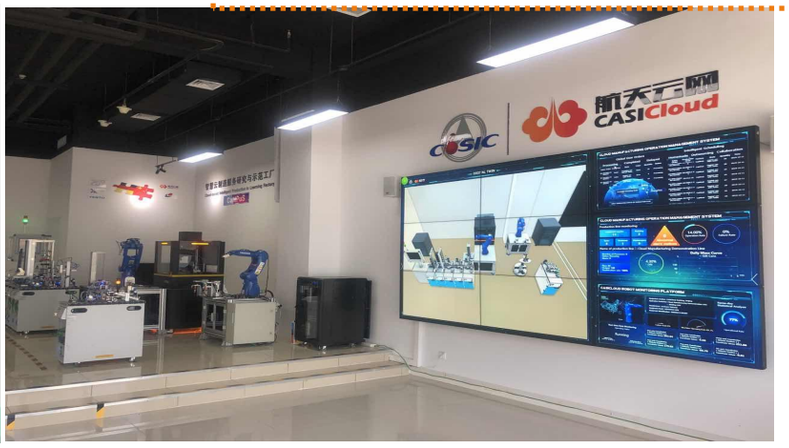
Coordinate and guide a new development pattern and implement a high-level opening to the world

4 Sino-German Government Science and Technology cooperation



Smart Cloud Manufacturing Service Research and Demonstration Factory Project ("2+2" project)

Based on the needs of Sino-German manufacturing industry transformation, fully integrate Chinese smart cloud manufacturing technology and German smart factory technology to create smart manufacturing and smart service based on the concept of cloud manufacturing. Project results of both parties have achieved incubation in Guangdong, Chongqing, Changzhou and other places, and landed in the Industrial Internet Empowerment Center to help industry talent training and technological innovation.



4 Cooperation with German Companies

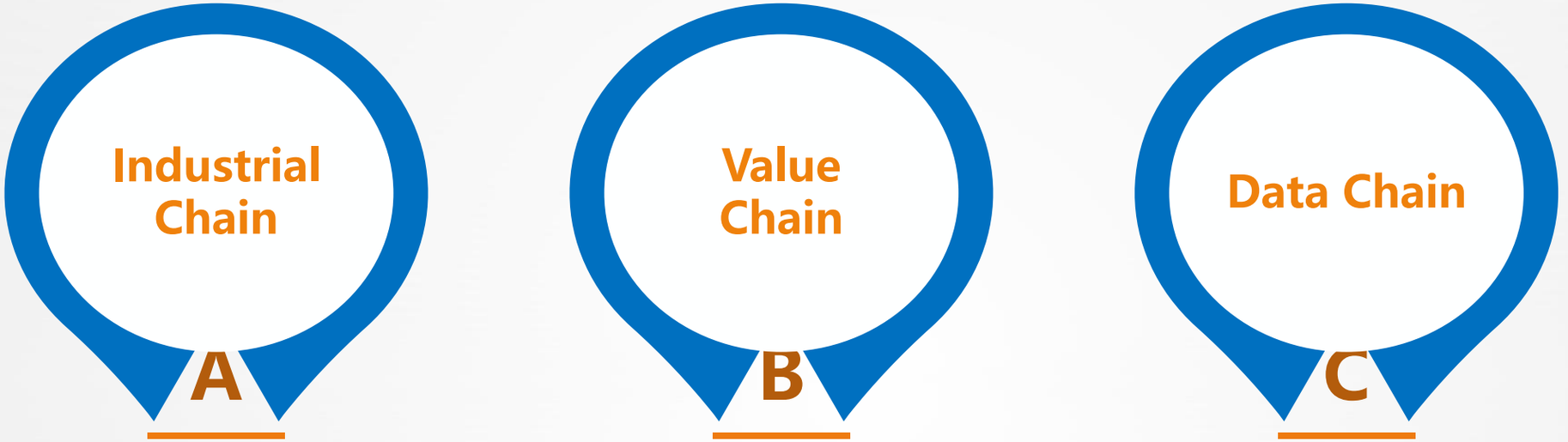
Siemens:
- Eco-system partners, products, research
- Sino-German smart manufacturing pilot projects,
- Regional industrial Internet empowerment center

FORCAM:
- High-end edge intelligent all-in-one products and solutions
- Integration of Forcam IIoT products, SAP ERP products and CASICloud CPDM products.

FESTO:
- Industrial Internet vocational education overall solutions and standard.

L&M: Supplies used to pandemic fighting
Kohl24.de: Introduction of high-end equipment
Yaband Media: Cross-border payments and online stores
Darmstadt Technical University: Sino-German technical exchanges and resource sharing.

4 APEC Industrial Internet Innovation Cooperation Ecosystem



- APEC SME Center for IT Promoting cloud service platform
- Lan-Mekong cross-border integrated service integration platform for the ASEAN countries
- Industrial Internet innovation cooperation platform in the Guangdong-Hong Kong-Macau Greater Bay Area

APEC中小企业信息化促进中心
APEC SME Center for IT Promotion

4 Suggestions

- Continue cooperation in industrial Internet with global partners to promote global industrial integration

- Build APEC SMEs Digital Transformation and Innovation Platform for manufactures in the Asia-Pacific region

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