Welcome to join us.

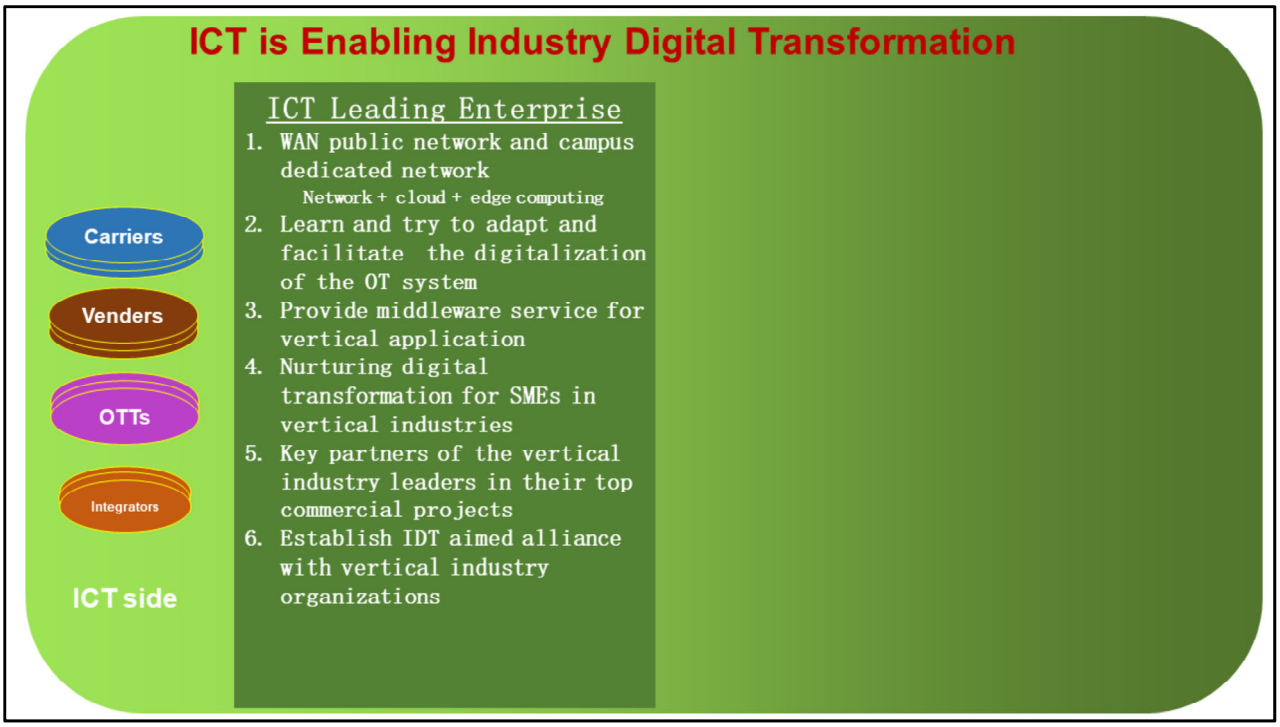
It's a pity that we cannot socialize in person, which is what we badly need. We hope that the workshop can help practitioners of industry digital transformation (IDT) in China and Europe to get to know each other and become partners that will communicate and work together going forward. Let's make full use of the 3 hours' web conference today.

Today, we are at the forefront of industry digital transformation (IDT). The ICT sector has invested heavily in enabling technologies and standards for 5G. Now they are doing their best to commercialize it and maximize returns as quickly as possible. Many vertical enterprises have embarked on the digital transformation. But pioneers are always confronted with tough challenges.

Today, it is far from enough to only talk about challenges. Instead, we should discuss how we carry out transformation and address the challenges. We should share our views on how IDT will play out down the road. Workshops like this give practitioners in China and Europe the big picture of IDT and a variety of case studies, and allow them to share their thoughts and lessons learned based on their practice.
This slide shows China's IDT ecosystem. At the top are leading companies in verticals and the ICT sector, CAICT, a famous Chinese industry think tank, and industry alliances formed by active players in ICT and industry verticals. They lead or play key roles in important IDT commercial projects. Most of the Chinese guests today are leaders or senior experts from these organizations. This slide is also an introduction to them. I know we have with us many senior European IDT experts as well. I hope both parties will have a fruitful discussion.

Some participants may wonder “What is CCSA?”

This slide can answer that question. I want to draw your attention to the highlighted sections. They show that IDT is a top priority for CCSA right now. We have developed targeted strategies and want to bring on board IDT industry alliances and vertical enterprises as special members. We also have the standards development process for industry verticals.



This is the first of a series of workshops. I will brief you on the background of China's ongoing digital transformation and the smart manufacturing sector.

1 . First, the Chinese context. Its huge market has the following impact.

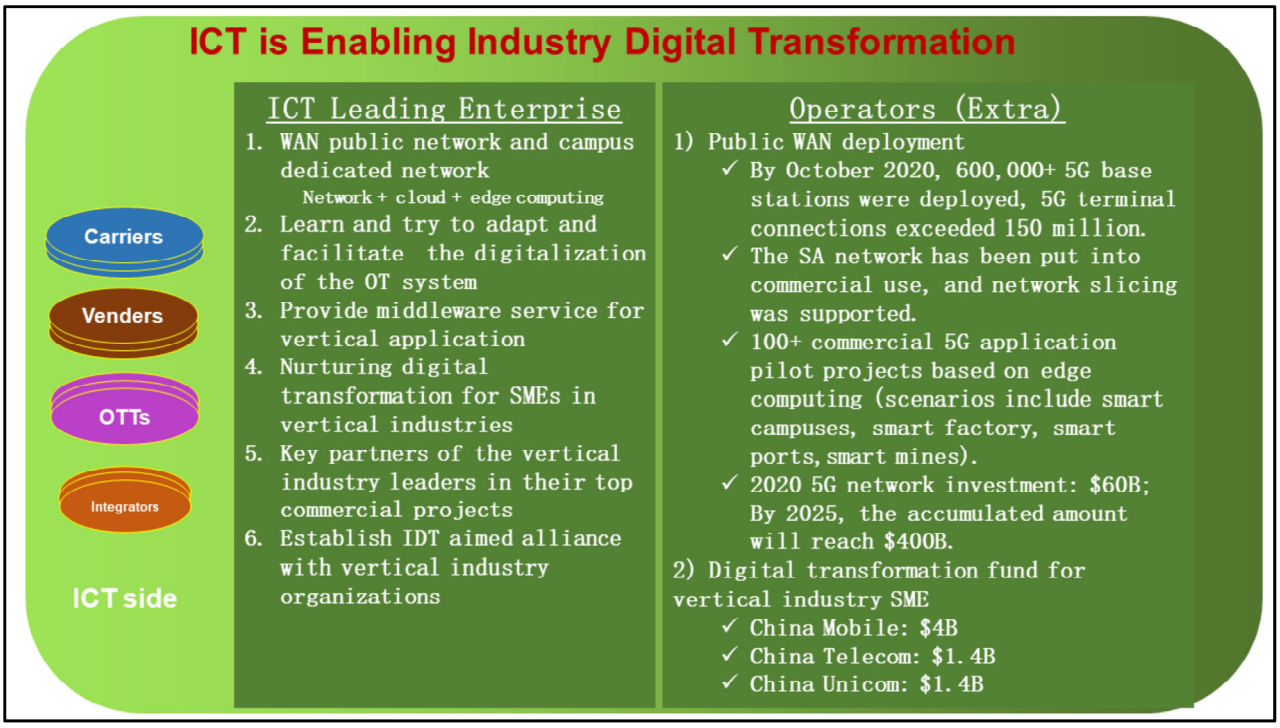
- A big driving force of national economic growth and industry innovation.
- Many industries in China have produced world-class leading companies.
    - The participantes today are the representatives from the ICT and vertical sectors.
    - These leading companies play a decisive role in driving China's IDT.
    - Looking into what they do will help us understand the process of IDT.

2. Secondly, I will share my interpretation of the logic behind the government's economic policies.

The government believes that IDT can improve the national industry and economic structure. So they think:

- The network infrastructure of digital transformation, as with all public goods, has so strong positive externalities that it is worth deploying at scale in advance.
- State-owned operators should make forward-looking investment plans.

This policy logic makes it possible to invest heavily for long-term benefits. It makes it possible to provide the network infrastructure with a variety of capabilities necessary for business development at the early stage of IDT. It is essential to tackling the macro challenges in building infrastructure for IDT.

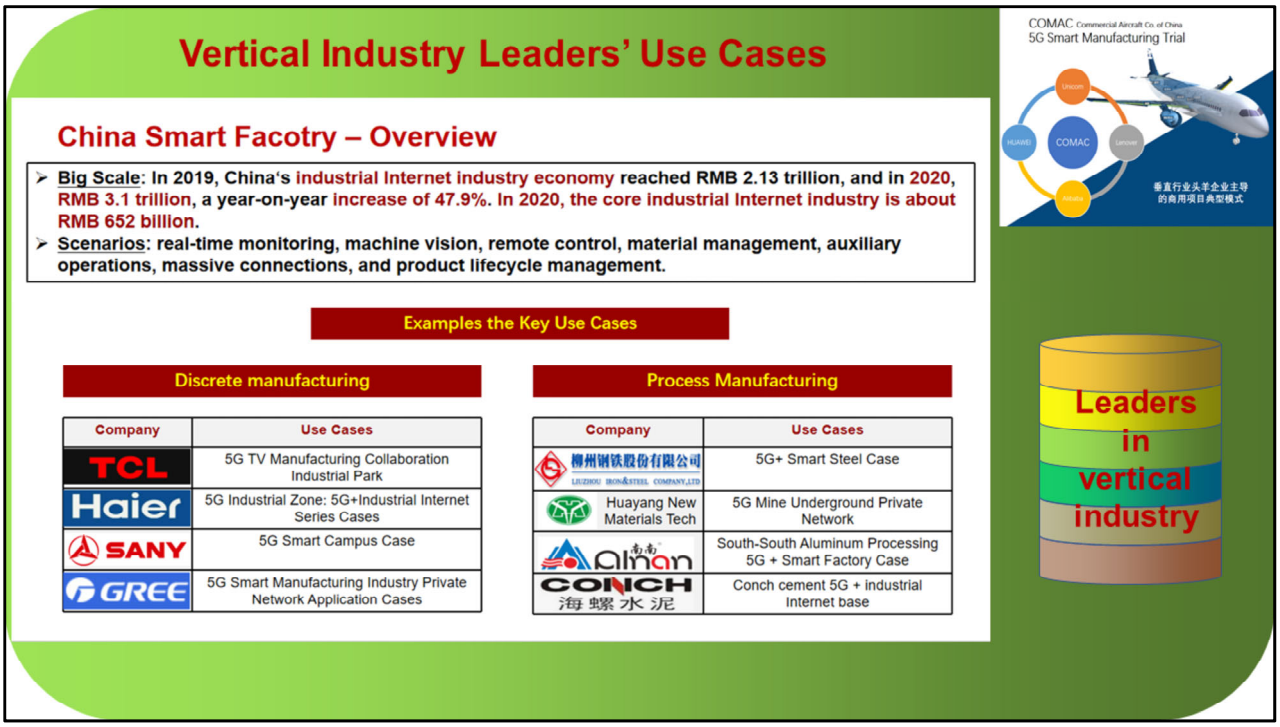


This chart shows what ICT industry players do (carriers/manufacturers/Internet companies/service providers): Pay attention to which things they do in the same way as their European counterparts and which things they do differently. Will this lead to different results?

1. Provide computing infrastructure such as network, cloud, and edge computing for vertical industry applications, including public WAN and private campus networks.
2. Learn about the OT systems and facilitate the transformation of OT systems to DT systems from the perspective of ICT
3. Build a layer of service midware under applications. *But it's a tricky question to draw lines between the midware and the factory's OT systems*
4. Incubate and support the SMEs in vertical markets to undertake IDT projects
5. ICT participates in commercial projects as a partner of leading vertical companies
6. Build alliances with industry verticals to develop the technologies, solutions, and test beds required for IDT

In addition, telcos did the following, to support these objectives:

- Build public WAN with computing power
  By October 2020, more than 600,000 5G base stations had been in use.
  SA (standalone) has been put into commercial use, laying a foundation for end-to-end network slicing
- More than 100 edge computing-based 5G commercial pilots have been rolled out, including smart campuses, smart factories, smart ports, and smart mines
  2020 saw a 5G network investment of US$60billion.
  By 2025, the total investment will reach US$400billion
- Establish IDT funds to support the vertical companies telcos are sponsoring
  China Mobile: US$4billion
  China Telecom: US$1.4billion
  China Unicom: US$1.4billion



Overview of vertical leaders' smart manufacturing projects

China's huge market is strongly propelling the growth of China's economy and industries. The IDT projects listed here are core to the commercial transformations of vertical leaders in China, which are playing central and decisive roles in IDT landscape because of their significance and value. And these projects share some common features.

Common features

- Clear and solid business reasons (for commercial purposes)
- Project essence: transformation and upgrade of core undertakings (addition of new business/higher efficiency and upgrade)/others
- Participation of strong ICT leaders as key business partners
- Project scope: covering all production elements
    - ❖ Manufacturing
    - ❖ Management
    - ❖ Marketing
- Full-spectrum of technologies required by IDT are involved for applications
    - ❖ In-depth coverage of 5G networks in all factory scenarios
    - ❖ 5G MEC (edge computing infrastructure) with AI on the edge provides better performance than CPE
    - ❖ Applications of 5G network slicing in industrial production.
    - ❖ Application scenarios such as 5G+AGV, 5G+remote maintenance, industrial vision, AR/VR-assisted assembly, and intelligent warehousing system

These are the commercial projects of some leading vertical companies. Please note that all of these projects have leading ICT companies as key partners.

Profound changes have been already felt!

In just a few years, China's ongoing IDT has had a profound impact on both ICT and verticals. It is changing, or getting "fused" into business core or a company's DNA. Let's save this topic for another time.

"Blooming Cup" 5G Application Competition-The 3rd in 2020

The theme of this contest is "Leading New Infrastructure, and Creating a New Era".

主办单位: Sponsor 中华人民共和国工业和信息化部

承办单位: Organizers CAICT 中国信息通信研究院 AIA 5G应用产业方阵 IMT-2020 中国通信标准化协会

Overview

- ✓ The contest focuses on industry digitalization, smart living, and digital governance.
- ✓ There are totally **4,289** applications based on **16** application scenarios, from **2,388** enterprises, research institutes, and industry associations in **30** provinces.
- ✓ More than 327 applications from vertical industries participated in the project, an increase of over 60% compared with last year.

Key Progress

- ✓ From the three-year competition projects, we can see the process of 5G applications **from creativity to demonstration and implementation**. In **2018**, **67%** of the projects were **in the initial stages** of creativity, research, and function design. **This percentage dropped to 16% in the third Blooming Cup competition in 2020**, and more **than 31% projects have entered the commercial introduction phase**.
- ✓ **Carriers**: The proportion of projects participating **increase to 72%.**
- ✓ **Vertical industry application companies and solution providers**: 200+ projects in 2019, **900+ in 2020**, increase 300%+.
- ✓ **Private enterprises** account for **58%** of industry application units and **68%** of solution providers respectively.
- ✓ **30 excellent cases were selected, including 10 first prizes and 20 second prizes. industrial IOT accounts for 43%, followed by medical IOT 20%, and multimedia, energy IOT, and intelligent transportation 10% respectively.**

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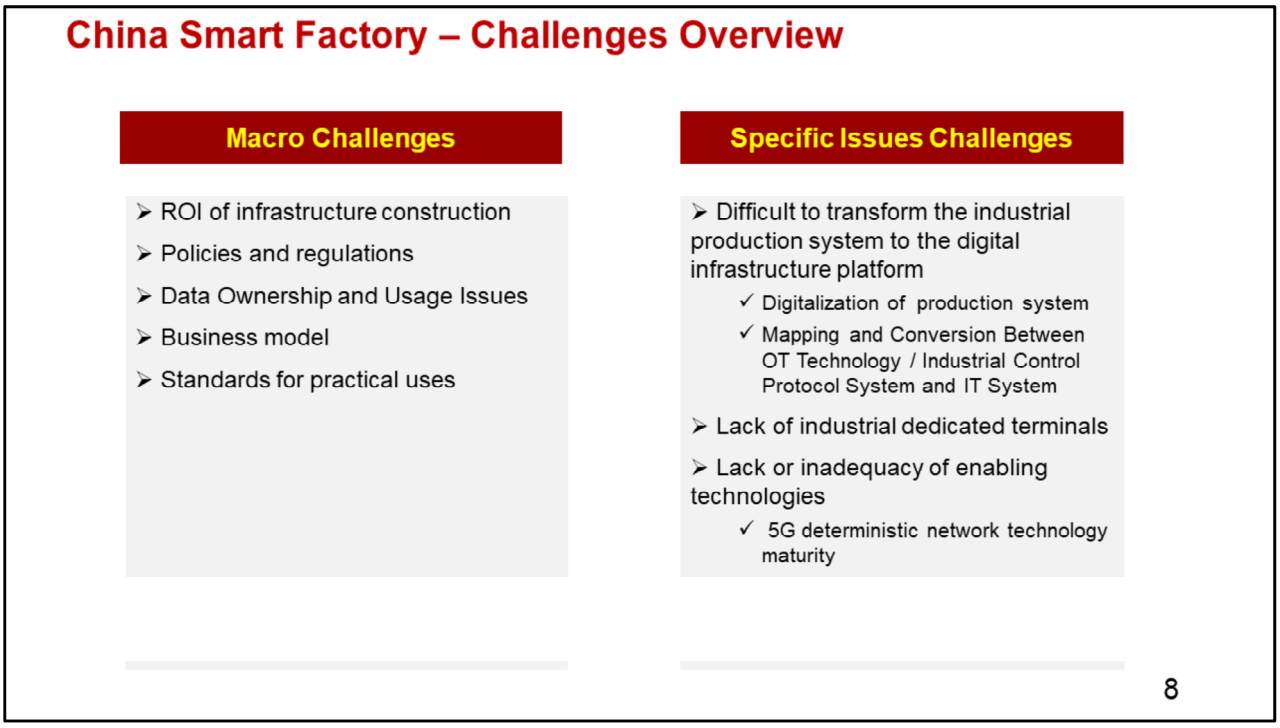
CAICT is an important national-level think tank, and is the director general of some key IDT industry alliances, such as the Alliance of Industrial Internet and the 5G Applications Industry Array.

CCSA, CAICT and the other two institutions have co-organized the 5G Blooming Cup competition for three years. This year, the competition received 4,300 application projects, and 900 of them are from verticals. The competition has provided our workshops rich materials for observing IDT's development in China.



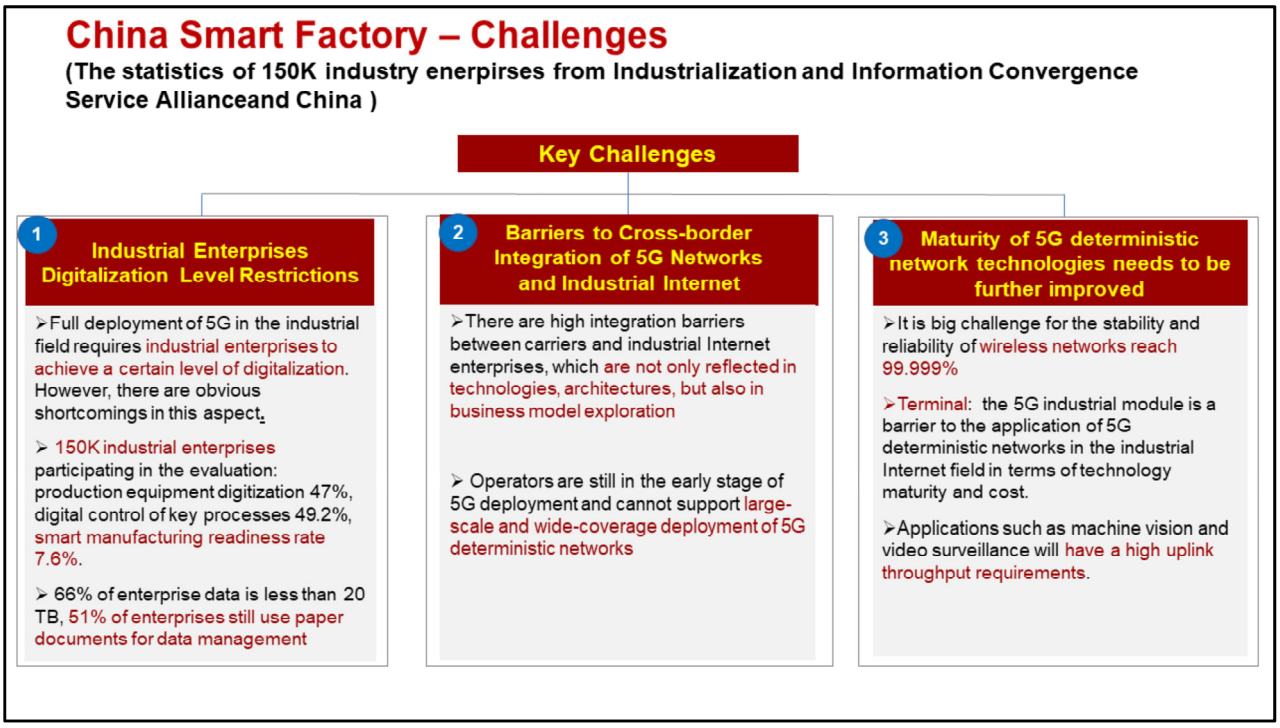
From the above-mentioned cases, especially those joined by vertical leaders and powerful ICT partners, the following challenges can be observed:

1. Global challenges:

- Network infrastructure ROI
    - Disagreement between two most influential industry leaders
- Total ROI of the ICT industry before large-scale commercialization
- Some manufacturing companies, weaker in digitalization, find it difficult to do IDT projects.
- Policies and regulations
- The realization of data ownership and data value
- Business model (electricity provision/partner/large-scale high-value business activities) and return model on ICT services
- Essential standards for real applications

2. Specific Challenges:

- Enormous difficulty lies in migrating the entire industrial production system to the DT platform
    - Digitalization of production systems
    - Mapping and conversions between OT technologies, industrial control protocols and IT systems
- Lack of dedicated industrial terminals
- Lack or shortage of enabling technologies
    - Technical maturity of 5G deterministic networks
- Verticals' low-level digitalization, for example:
    - Numerical control rate of production equipment and key processes
- Readiness of intelligent manufacturing
- Other weaknesses of industry verticals



By now, ICT is a main technical driver for the digitalization of industry verticals. But ICT technology providers don’t fully understand verticals' pain points and bottlenecks during digital transformation, or their business processes and culture.
Verticals' digital transformation requires more than technology enablement. In order to adapt ICT technologies and infrastructure to verticals' business requirements, the transformation of business processes and culture should also be considered.

What’s more, these vertical industries also have their own deep-rooted circles, industry chains, and interest chains. This is why I said earlier that generally speaking, verticals matter most for DT of their core business, and their ideas and practices matter the most.

The above is an overview of IDT today in China, a background for reference.

Thank you for listening. I hope we will have an interesting discussion and a fruitful workshop today.