



**ShangHai Advanced Research Institute, CAS**

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# Digital transformation of urban economy and case study

content

Why Digital Transformation of Urban Economy?

What kind of logical thinking should entrepreneurs have?



# 1

## **PART-01** **Why Digital Transformation** **of Urban Economy?**



# Digital transformation of Shanghai Urban

Goal: By 2035, become an **influential international digital capital**

## Digital transformation of urban governance



Persevere in holistic transformation

## Digital transformation of urban economy



Persevere in all aspects empowerment

## Digital transformation of urban life



Persevere in revolutionary reshaping

## What is the underlying Logic ?

# The Era - Characteristics

## Profound changes unseen in a century

V=Volatility (易变性)

U=Uncertainty (不确定性)

C=Complexity (复杂性)

A=Ambiguity (模糊性)

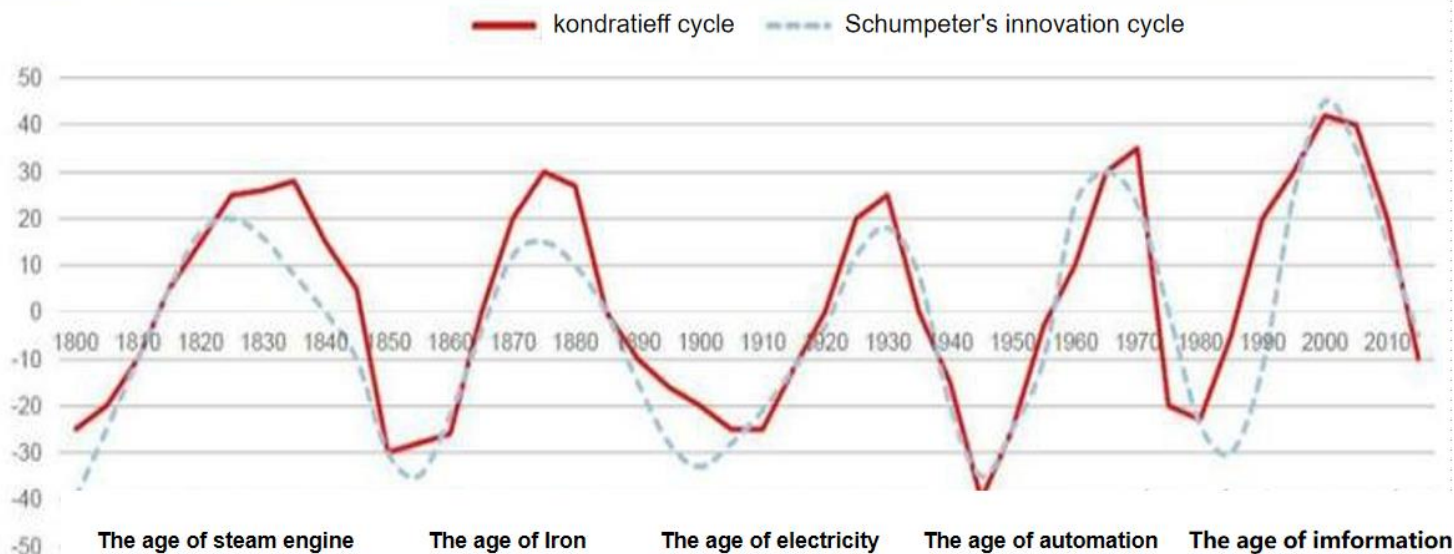
### The Era of VUCA

- ① The international environment has gradually become **complex**, and the **instability** and **uncertainty** have obviously increased;
- ② The world has entered a period of upheaval;
- ③ The impact of COVID-19 is widespread;

# The Era - Economic trends

## The Theory of Kondratieff Cycle

kondratieff cycle division



- ① A new round of scientific and technological revolution and industrial transformation have deeply developed.
- ② The balance of international power has adjusted profoundly
- ③ Economic globalization has encountered a countercurrent

# The Era: Technology trends

## The Era of ABCDEFG+

Vertical integrated and networked intelligent manufacturing system



Horizontal integration through value network (supply chain integration)

### Industrial intelligence link

Optimization and prediction based on industrial mechanism, knowledge map and algorithm

**Industrial data link**  
High quality data sets and domain models

**Industrial object link**  
Application scenario+ digital twin



Blockchain



Artificial intelligence



Edge cloud collaborative computing



Big data



Face recognition



Engineering end-to-end digital integration spans the entire value chain

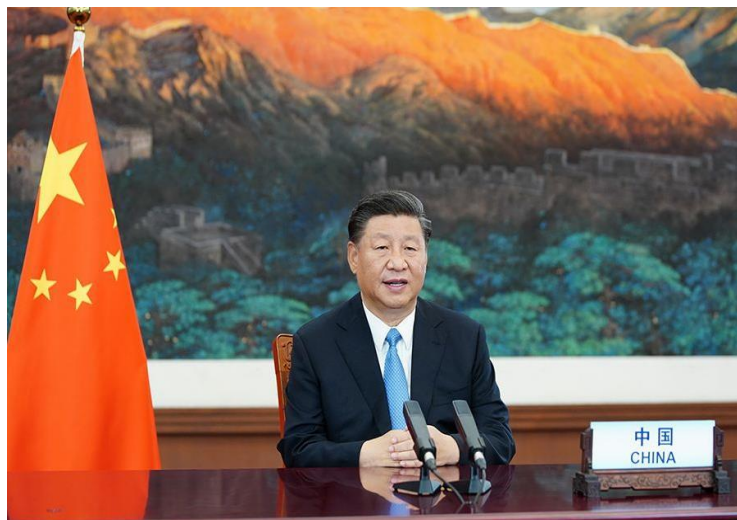


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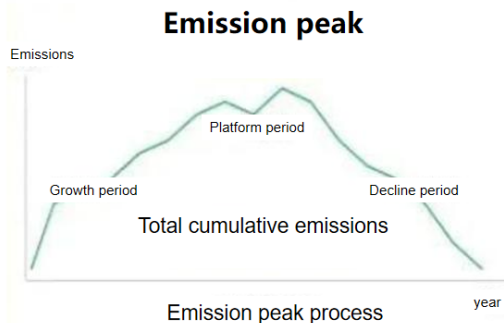
# The Era: 3060 Vision

On September 22, 2020, Jinping Xi announced China's new summit goals and carbon neutral vision at the general debate of the seventy-fifth UN General Assembly.



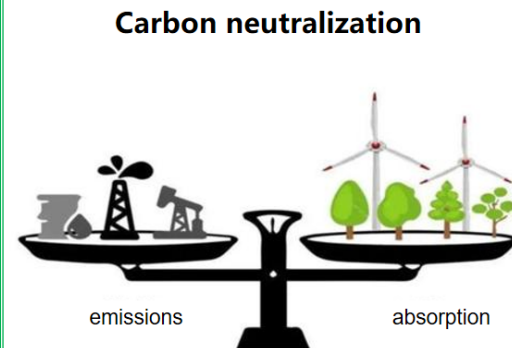
## Carbon emission peak

Graph1 The graph of carbon emission peak



## Carbon neutralization

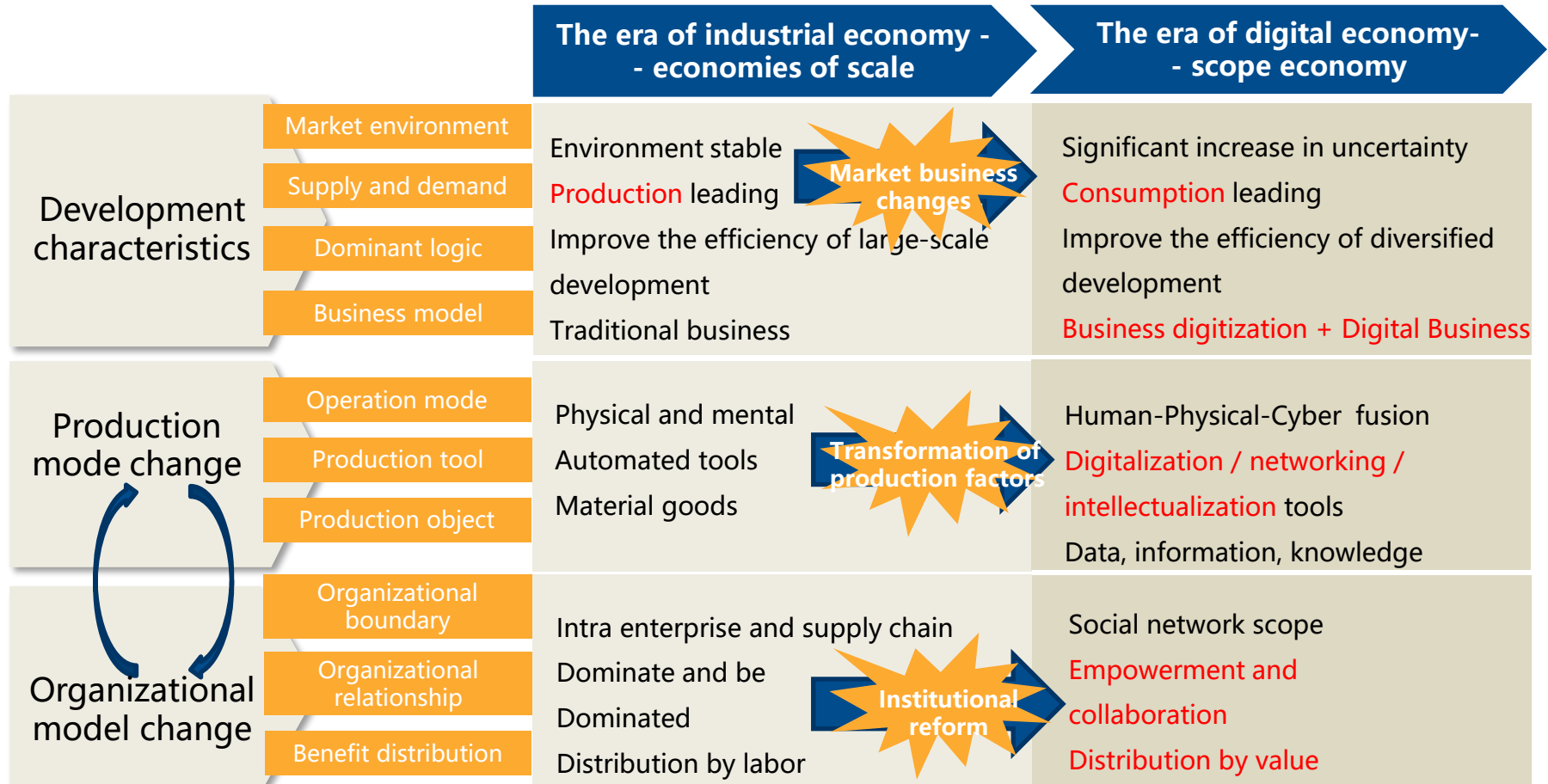
Graph2 The graph of carbon neutralization



“Carbon dioxide emissions will reach the peak by 2030 and strive to achieve carbon neutralization by 2060 ”



# Digital transformation is a systematic change



# The law of digital economy

**The digital economy** presents a new operating law: **with the automation of data flow, resolve the uncertainty of complex systems**, realize the optimal allocation of resources, and **support the new economic state of high-quality development**.



**Every enterprise is a complex system**

# 2

## PART-02

**What kind of logical thinking  
should entrepreneurs have?**



# Explore the essential driving force of enterprise digitization?

**Brainstorm:** the core of economic digital transformation is enterprise digital transformation, so why do we need digital transformation from the perspective of enterprise?



human intelligence



artificial intelligence

## Logical Thinking : Why enterprise digital transformation?

# The fundamental task of digital transformation is the reconstruction of value system

Enterprise opportunities: a critical period of **value oriented** digital transformation



## Technology orientation

Taking the advanced nature of technology / products as the main measurement standard



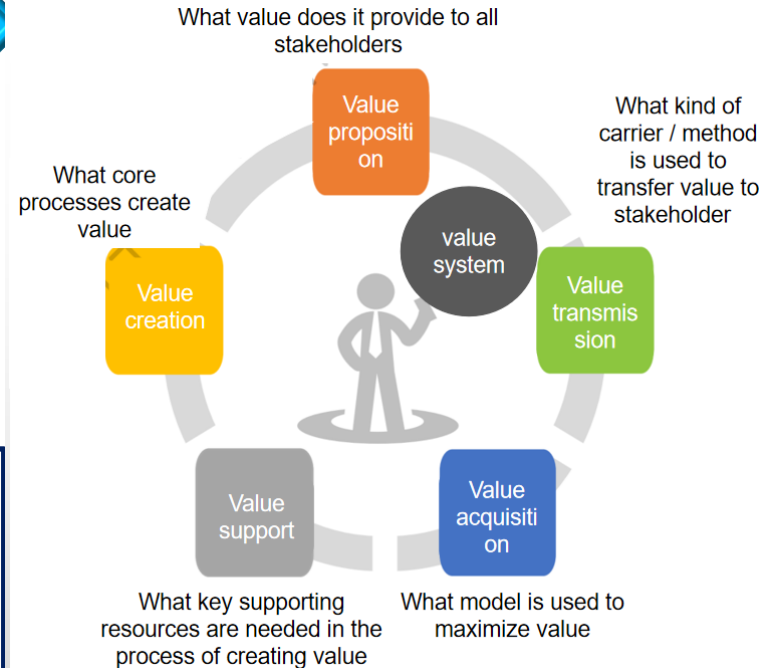
## Business orientation

Taking the satisfaction of business needs and the improvement of business capacity as the main measurement standard

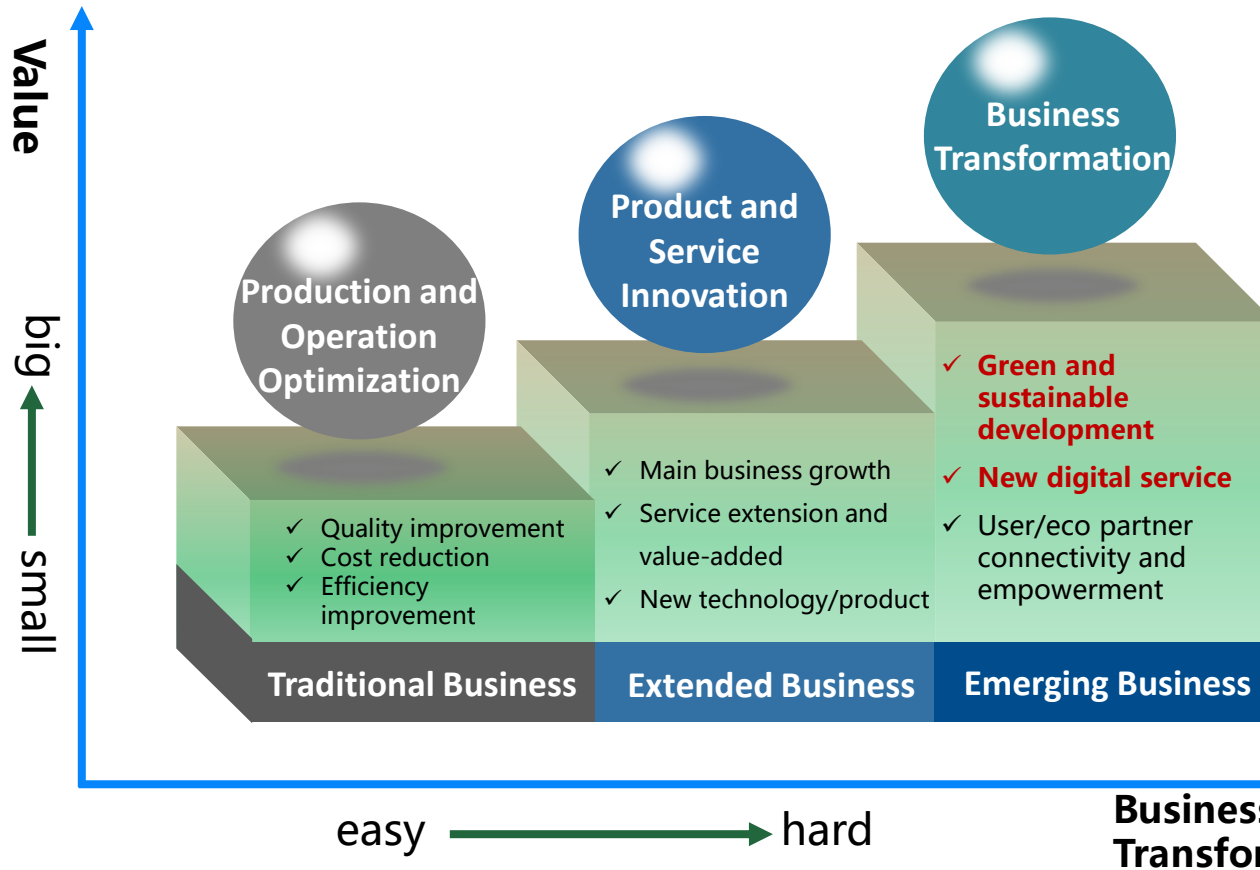


## Value orientation

Obtaining the overall value and benefit of enterprise sustainable development as the main measurement standard



# What value benefits can enterprise digital transformation bring?



**The entry point of Enterprise Digital Transformation?**

Quoted from AITRE "Digital Transformation Workbook"



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# Explore Enterprise Digital Transformation? (What)



**Logical Thinking:** what is  
enterprise digital transformation?



# What is Digital Transformation

**Enterprise digital transformation** refers to a **systematic transformation process** in which enterprises fully integrate with **digital technology** to form **new capabilities**, promote business innovation and transformation, and continuously build a **new value and benefit system**.

## Four Basic Understandings of Digital Transformation



Digital transformation is a **systematic transformation** triggered by information technology



**The basic task** of digital transformation is to **reconstruct the value system** through three integrations

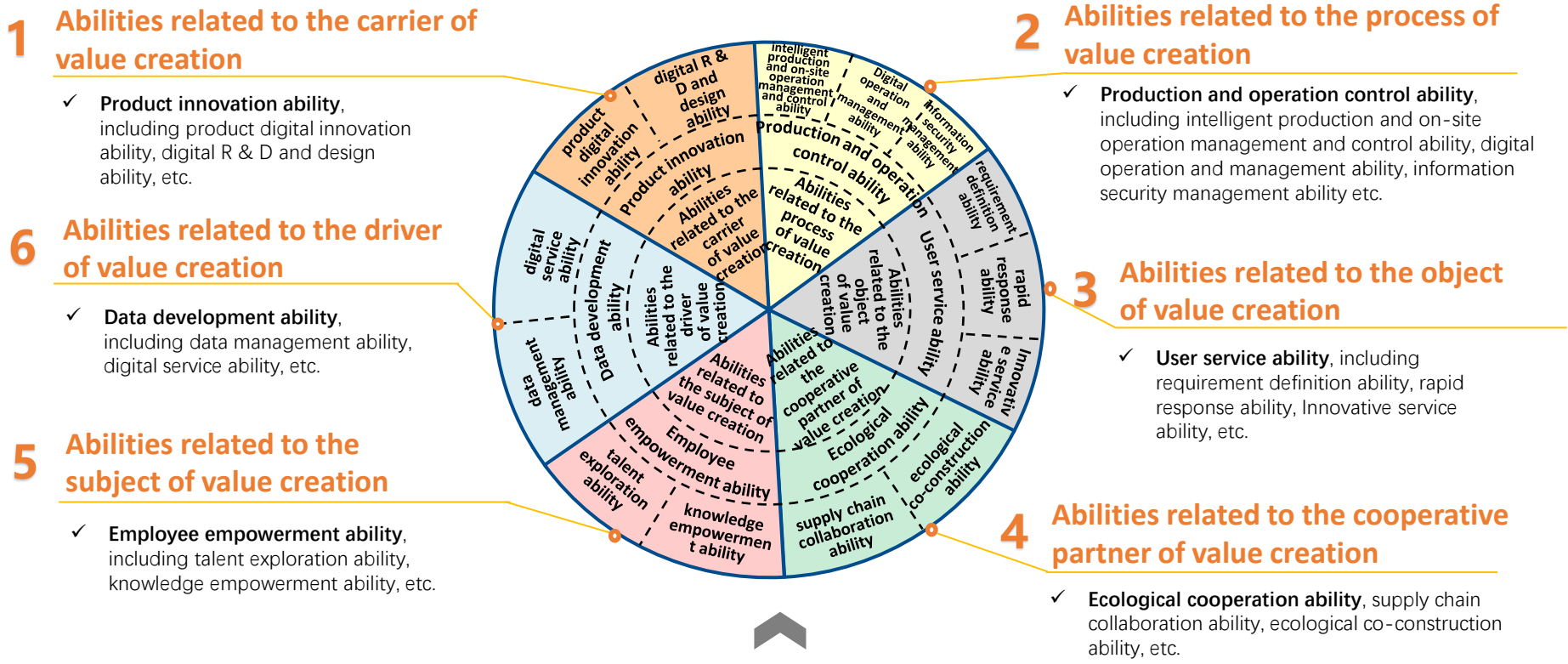


**The critical path** of digital transformation is the construction of **new digital capacity**



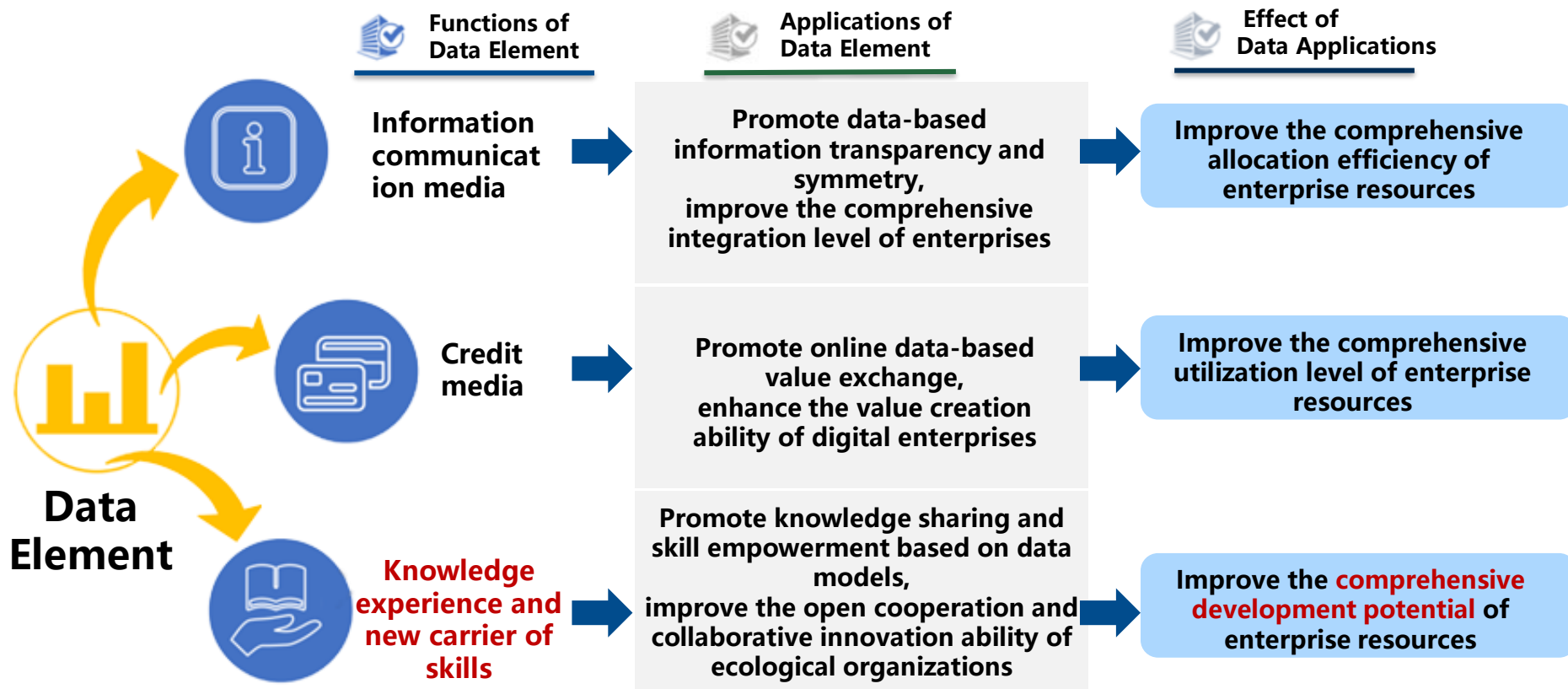
**The key element** of digital transformation is **data element**

# The critical Path of Digital Transformation is to build new Capabilities



Main Perspectives of New capability

# The Key Driver of Digital Transformation Is Data



Quoted from CITIC *Digital Transformation Workbook*

# The Ultimate Goal of Enterprise Digital Transformation

## Smart Enterprises in the Future



Fully aware and  
always online  
"organism"

A "smart body"  
with self evolving  
"brain"

Open ecosystem  
with deep  
integration of  
Human-Cyber-  
Physical



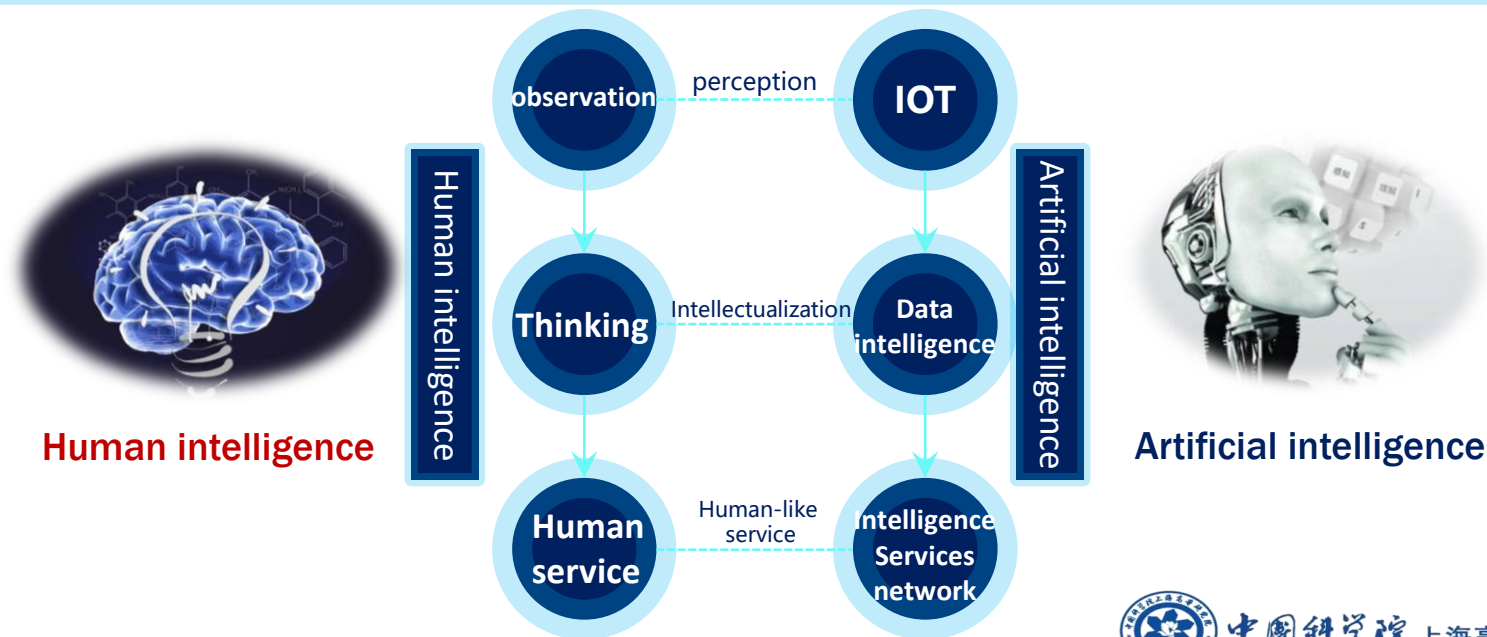
High End Oriented, Intellectualization, Greening

Reference: Alibaba *Smart Building white paper* written by Dejun Ning

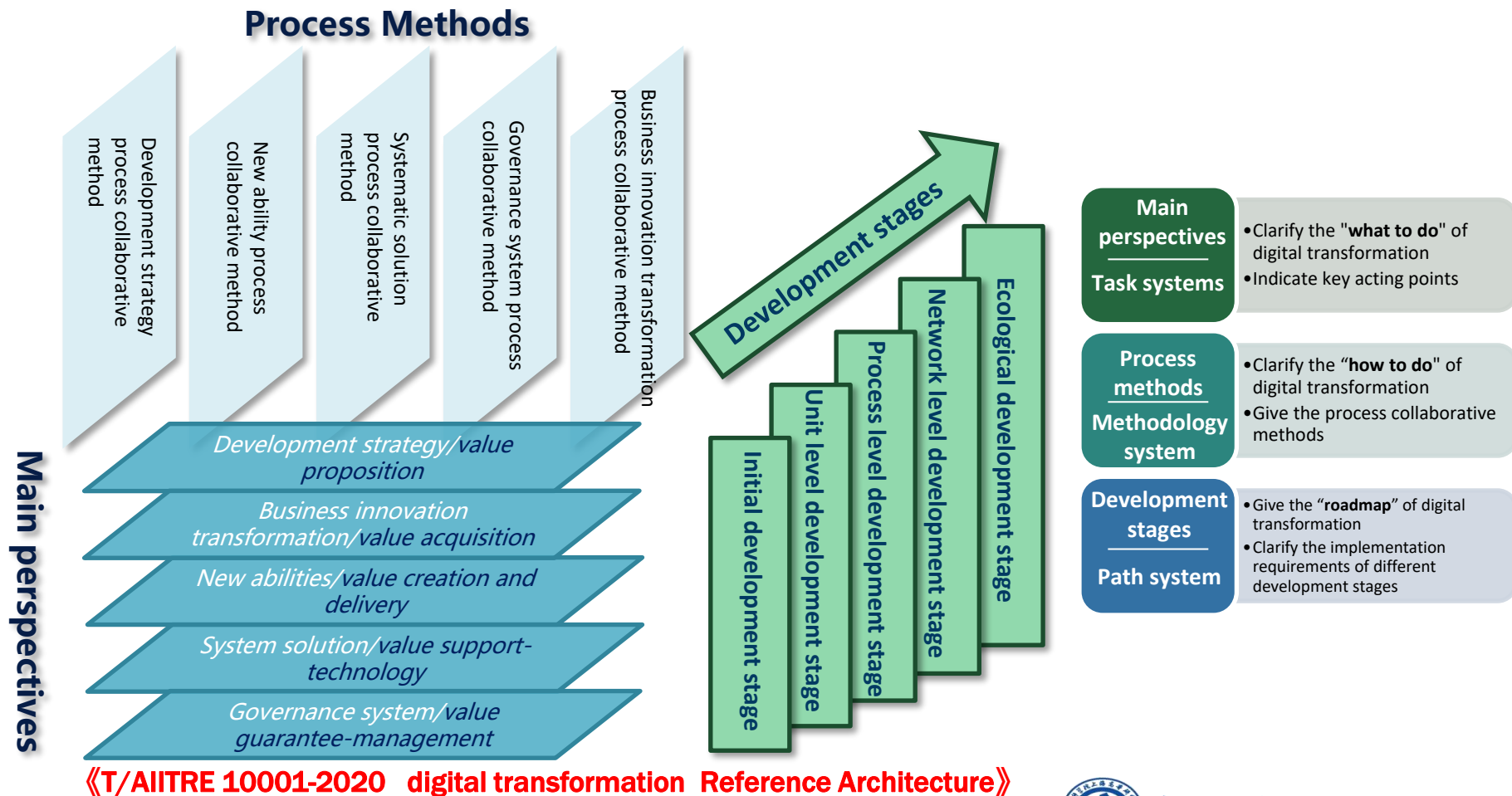
# Explore the Basic Mode of Enterprise Digital Transformation? (How)

**New Value Benefit** = Business Scenario (**New Capabilities**)

New Capabilities = **Application Scenario** ( ( Human Observation+ Human Thinking+ Human Service)  $\cup$  (**IOT + Data intelligence + Intelligence services network**) )



# Methods of Enterprise Digital Transformation





# Methods of Enterprise Digital Transformation

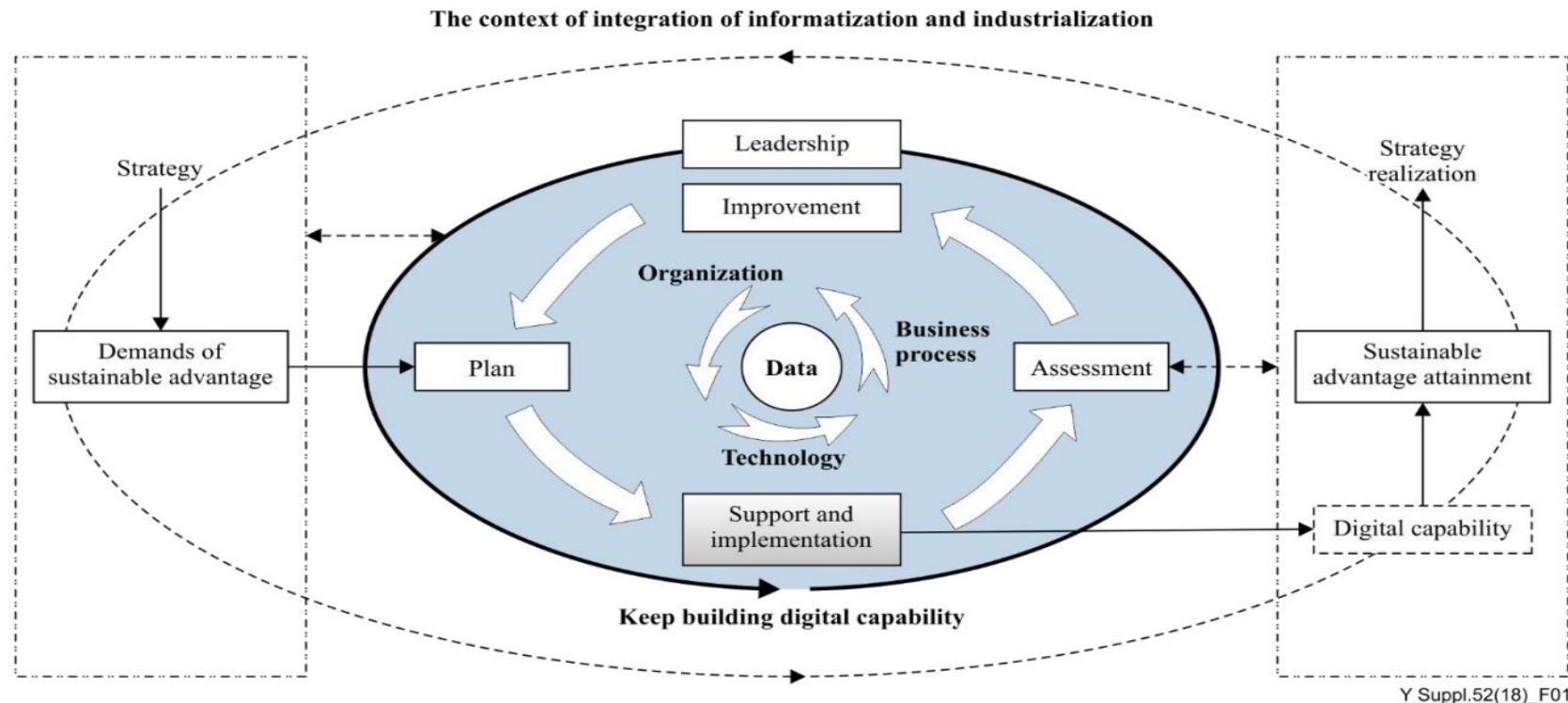


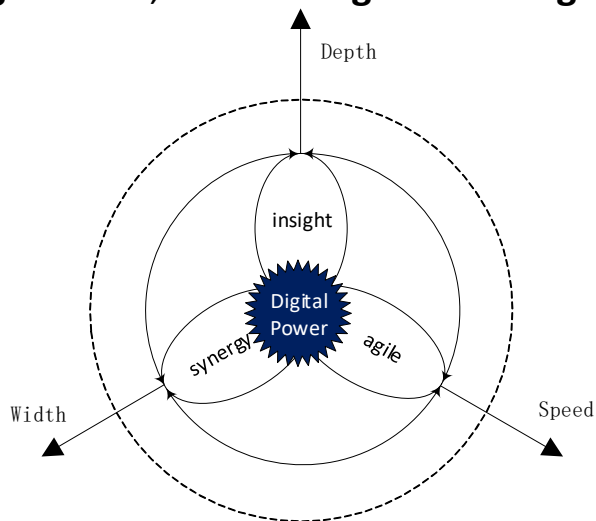
Figure 1 – The framework for building digital capability of enterprises<sup>1</sup>

《ITU-T Y.Sup52 : Methodology for building digital capabilities during enterprises' digital transformation》



# The Core Competitiveness of Enterprises in the Era Of Digital Economy - Digital Power

**Digital power** takes digital information as the key production factor and the continuous developing cutting-edge technology as the driving force to drive mankind develop towards digitization, networking and intelligence.



The leading position of **digital power** is to reduce and eliminate **uncertainty** through timely acquisition, effective control and efficient utilization of digital information, and **convert digital information into material and energy**, so as to build **the driving force of sustainable development, sustainable profit energy and brand influence** for enterprises.

Reference: *Research Report of Institute of information and communications*

# Case Study- intelligent Production mode innovation of digital empowered enterprises



## Enterprise profile

XX is an important thermal power plant, it supplies power to Shanghai power grid , supplies steam and demineralized water to users in the chemical industry park. At the same time, it recovers the user's by-product steam and condensate for recycling after treatment.



## Project overview

In the digital transformation of urban economy, how can enterprises solve the following challenges :

- Real time monitoring and demand prediction of customers' electricity and heat consumption ?
- Production scheduling based on customer power and heat demand prediction ?
- How to ensure heating quality to meet customers' heat demand ?



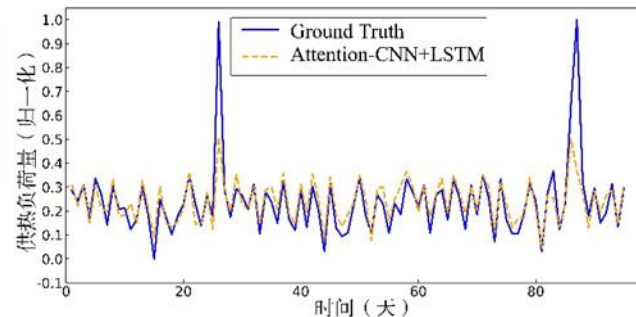
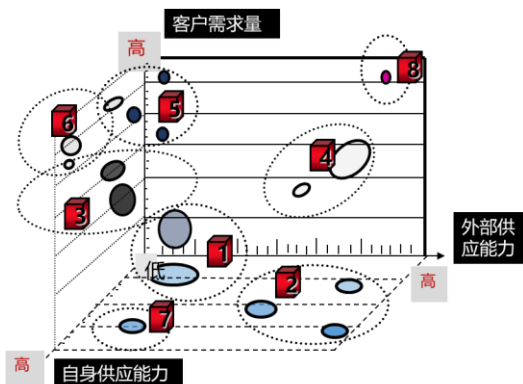
## Thinking

- As an expert of enterprise digital transformation, how do you want to help enterprises solve these problems?

# Application scenario: Gas-steam Combine Cycle Unit --operation optimization

## Action 1

Accurately predict user demand (load side) :  
Attention-CNN+LSTM, the accuracy can reach 89.52%



Optimize operation scheduling according to **energy consumption and heating demand** to ensure heating requirement and increase unit power.

## Action 2

**Intelligent Algorithm + High Quality Dataset = Intelligent Software**

## Survival of The Fittest

1. Why Digital Transformation of Urban Economy?
2. What kind of logical thinking should entrepreneurs have?
3. Q&A

上善若水  
海納百川  
地力創  
同贏未來

白雲飛渡



Thank You!