Several Thoughts on Regulating New Technologies and Services

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Contents

Characters of the New Technologies

1

Deep link of Persons, Organizations and Things

Wearable devices, smart homes etc. to realize intelligent services with high accuracy.



Rudimentary Stage

2

Extension of Human Physiological Functions

Smart devices, such as unmanned cars/aerial vehicles /balloons, will further extend human's senses, limbs and other physiological capabilities to complete complex tasks.


Expansion Stage

3

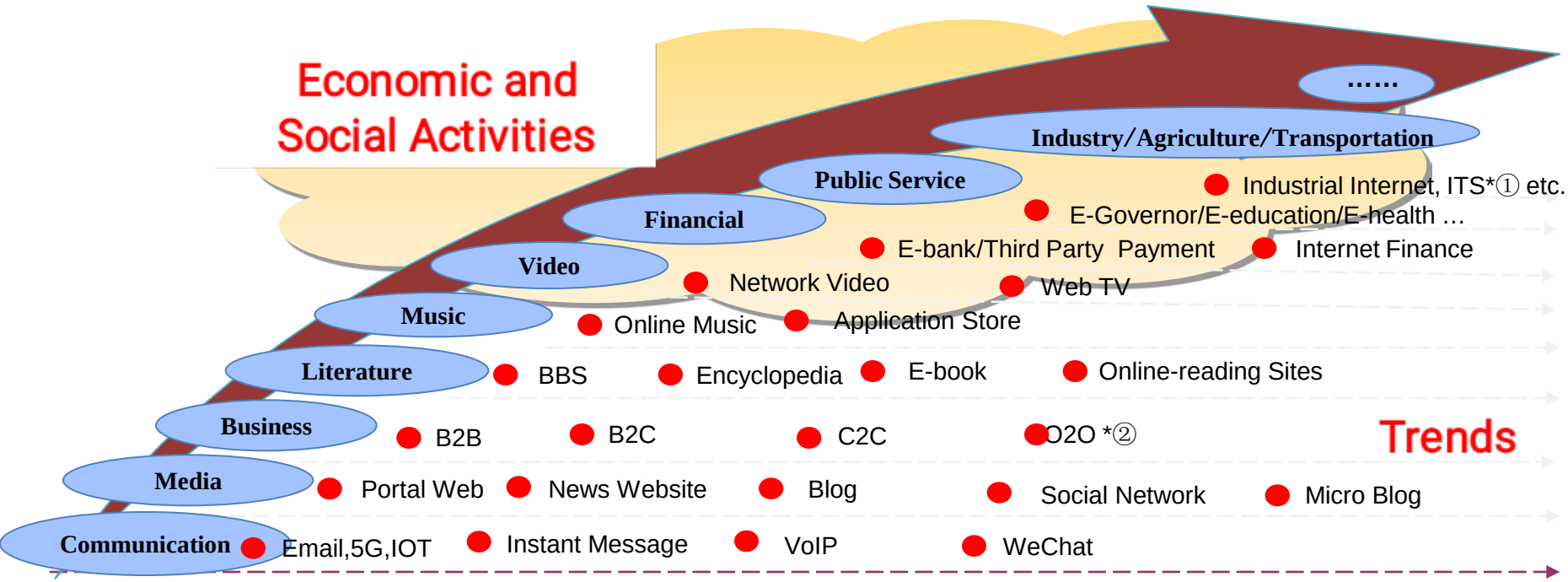
Extension to Intellectual Functions

Artificial intelligence, natural computation, self-adaptive system, big data and other emerging technologies will allow machines to develop their abilities of learning, adaptability and evolution which can help people think and solve the problems that traditional algorithms and machines cannot handle.



Steady Growth Stage

Trends of emerging technologies and services



Rapid iteration

Cross Border Fusion

Features

O2O Linkage

'Platform + Ecology'

Large Uncertainty in Market

*①ITS：Intelligent Telecommunication System *②O2O：Online to Offline

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1.Basic principles and thoughts of making policies and regulations

The Four Relationships:

◆Balance the development and security.

◆Rules should be fault tolerant to promote innovation.

◆Setting bottom line and having risk control plan should be part of the measures.

◆Clarify the boundary between government and market

◆The government focuses on making and creating a fair competitive environment.

◆Develop industries self-regulation and corporate governance.

◆ Online and offline issues are often intertwined and should not be treated separately.

◆ Extending management rules and subjects from offline to online.

◆ Offline management and accountability should be improved taking into consideration the online issues.

◆Keep in mind the national specifics while learning from the international experience.

◆Keep up with the technology development trend and release of standards.

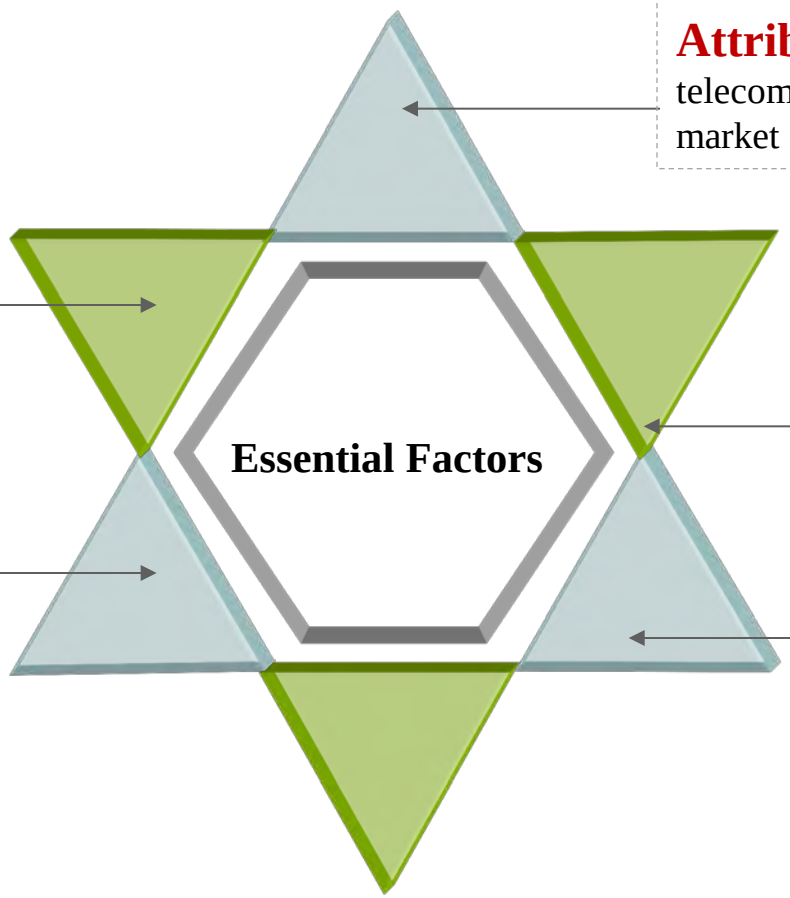
◆Keep in line with the international regulations and standards.

2.Determine the regulatory framework according to the objectives（1/4）

Objective 1: Promote the development of enterprise

Determine the Service Attribution: is it the telecommunication business? Is it for market access or filing only?

Resource Allocation: The planning and management of numbers or spectrum resources.



Tariff management: Adopt market regulation or set the cap?

Infrastructure Construction: The stimulants for infrastructure construction.

Standard: The standardization of terminals and the achievement of international interoperability.

2.Determine the regulatory framework according to regulatory objectives (2/4)

Objective 2: network and information security

National Security

- Cyberspace security
- Adopt the international rules
- Content security

Industry security

- key technologies
- open market
- Secure critical infrastructure

Network security

- System security
- Information security
- Data security

Operation Security

- Personal safety
- physical security
- Environmental protection and energy conservation

2.Determine the regulatory framework according to regulatory objectives (3/4)

Objective 3: Mantain the market order

Offline

Business

Network

- Impact of new technologies and services on traditional business
- Establishment of market rules (regulation of the improper competition in markets)
- set up the corporate responsibility
- The Network Neutrality Rules
- The impact on telecommunication operators

2.Determine the regulatory framework according to regulatory objectives (4/4)

Objective 4: Protect the lawful rights of consumer

Complaint Handling

Dealing with the complaints from consumers is an long-term and important task for all regulators.

Content Control

With the surge of the information content of Internet, great challenges have come up with content regulation and control, especially children's online protection.

Privacy Protection

Privacy protection is critical when all people and things are connected to the network; it is getting difficult with the cross border flow of data.

Intellectual Property

Broadband service makes the copyright infringement "easier", and disputes over IP are not limited to text.

Contents

1.Policies supporting new technologies in China

- **The Chinese government attaches great importance to the development of ICT industry.** Many policies have been issued since 2013.

In 2013

1.Guiding Opinions of the State Council on Promoting the Orderly and Healthy Development of the Internet of Things.

2.The State Council, "Broadband China" Strategy and Implementation Plan.

In 2015

1.The State Council, Opinions on Promoting Innovation and Development of Cloud Computing and Cultivating New Commercial Activities in the IT Industry.

2.General Office of the State Council, Guiding Opinions on Development of Group Innovation Space and Promotion of Public Innovation and Entrepreneurship.

3.The State Council, Opinions on Vigorously Developing E-Commerce to Speed up the Nurturing of New Economic Drivers.

4. General Office of the State Council, Guiding Opinions on Accelerating the Construction of High-speed Broadband Network to Increase Internet Speed and Cut Service Charges.

5.The State Council, Made in China 2025.

6.The State Council,Guiding Opinions on Actively Promoting the "Internet Plus" Action Plan.

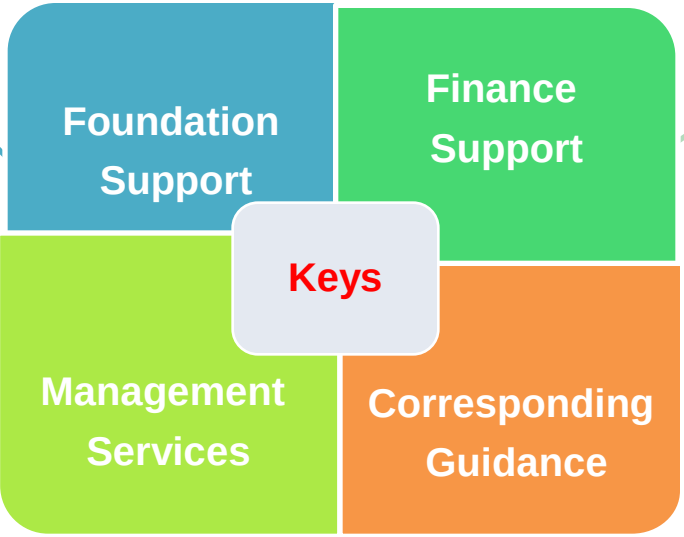
7.The 10 ministries and commissions, Guiding Opinions on Promoting the Healthy Development of the Internet Finance.

8.The State Council, Action Outline on Promoting the Development of Big Data.

2. Key points of the government policies

✓Implement the strategy of "Broadband China"
✓Promote universal services
✓Implement infrastructure sharing (Establish the China Tower company).

✓Support finance and taxation. Such as direct subsidy, credit, equity investment, risk compensation.
✓Adopt model of PPP.



✓Improve the efficiency of examination and approval.
✓Reduce the requirements for access.
✓Establish or coordinate the industry standards.

✓Promote the establish of industry alliance.
✓Build the public and functional technology R&D platform.
✓Increase application demos.
✓Encourage talents introduction.

3. Regulatory Practices in China (1/4)

- **The new ICT technologies and services are mainly the integrated and cross-border ones. There is no uniform regulatory paradigm in place. Therefore coordinated management and supervision of relevant regulatory authorities are required.**

- **As the regulator of network security and ICT applications, Cyberspace Administration of China recently issued a series of regulations aiming at WeChat and other mobile APPs, such as:** Interim Provisions on the Administration of the Development of the Public Information Services of Instant Messaging Tools, Provisions on the Administration of Internet Information Search Services, Mobile Internet Application Information Service Management Regulations, etc.

- Ministry of Industry and Information Technology, being the Chinese telecommunication administration, has released The Guidance of Telecom and Internet Industries Security Work, Measures for the Administration of New Technologies Records, Regulations on Personal Information Protection of Telecom and Internet Users,as well as the management regulations of mobile instant messaging service, cloud services and other new services.

3. Regulatory Practices in China (2/4)

➢In July 2015, the People's Bank of China and other nine ministries issued **Guiding Opinions on Promoting the Healthy Development of the Internet Finance .**

➢ **The "Guiding Opinions"** has clearly defined online finance as the important strategic direction of future financial information services.

Guiding Opinions

1.Clarify the business nature of various types of Internet finance;

2.Clarify the businesses which the financial enterprises should not do;

3.Clarify the assignment of regulatory responsibilities of various functional departments for different Internet financial business;

4.Clarify the positive attitude of the state to encourage innovation and support the development of online finance .

For example：

To prevent the financial security risks

In 2014, 275 P2P enterprises closed with their owners escaping with money, accounting for more than 17% of the total platforms.

Aiming at these problems,Guiding Opinions set a bottom line for P2P operation.

➢No illegal fund raising and no establishment of funding pools

➢No platform can be used to provide guarantee, credit service

Thus reducing the risk of P2P financial security.

✓Internet payment (The People's Bank assumes responsibility)

✓Internet lending and consumer finance (CBRC assumes responsibility)

✓Internet fund sales and equity-based crowd-funding (CSRC assumes responsibility)

✓Internet insurance (CIRC assumes responsibility)

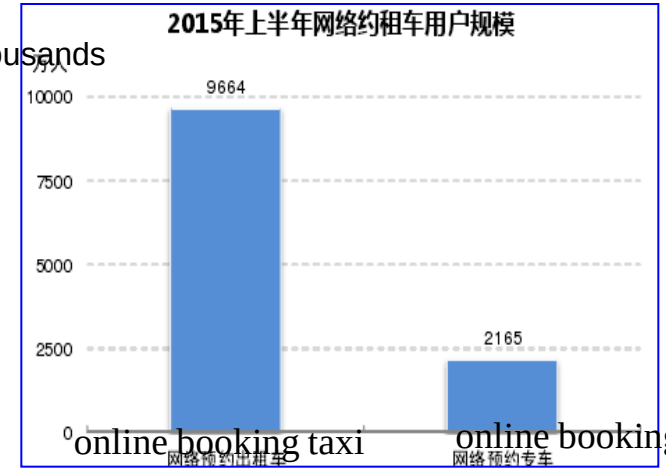
3. Regulatory Practices in China (3/4)

➢New applications are developing rapidly in China in the field of Internet and transportation, such as booking taxi, limo by mobile phone, and carpooling.

➢ In the first half of 2015, the customer base of online booking taxi is the largest in network car rental market, up to 96.64 million people, which accounted for 84.8% of the total using online car booking applications. The customer base of online booking of limo is 21.65 million, 19% of the total using online car booking applications.

Didi and Kuaidi merged in February 2015, and renamed as Didi travel in September 2015.

the customer base of online booking taxi in the first half of 2015



□On October 10, 2015, the Ministry of Transportation issued Interim Measures for the administration of online taxi booking operation service (Draft for comments), which put forward the regulatory framework with mandatory requirements for certificates of platforms, vehicles and drivers.

Contents

1.Unmanned cars

Technology features: driver assistance technology and unmanned technology.

Regulatory concerns: legislation and regulations, technology standards and security test and assessment.

Unmanned cars:

——**Legislation and regulations:** traffic rules, disposal of the accident liability and insurance mechanism;

——**Technology standards:** advanced driver assistance systems(ADAS), unmanned technology, situation awareness and sensor technology;

——**Security assessment:** the security of vehicle information control system, data interaction and privacy protection, personal safety and anti radio interferences.

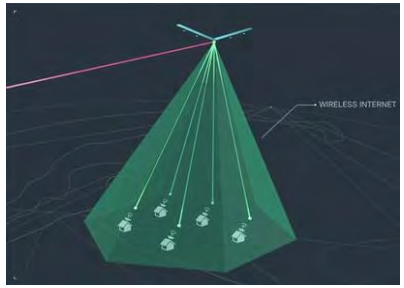
2.New Technologies of aeronautical telecommunication

Technology features: using aircrafts and satellites to deploy space network and provide broadband access services.

Regulatory concerns: management of spectrum and orbit resource, network and information security and coordination of cross border radio interference.

The balloon communication: the "aerial signal tower" operating in the stratosphere adopts LTE technology standards to fill the blind area of global network coverage.

Regulatory focuses: control of airspace security and frequency, cross border radio interference and information security.



Unmanned Aerial Vehicle (UAV): for example, the UAV "Aquila" developed by Facebook is used to provide Internet access in remote area worldwide; Google has carried out "Skybender" program to deploy new communications network through UAVs.

Management of airworthiness and spectrum, network information security and prevention of cross border radio interference are included in regulatory concerns.

Small satellite of low and middle earth orbits : The world has already begun to deploy the small satellite broadband communication network.

Regulatory issues: frequency orbit resource planning, network information security, landing license, etc.

3.NB-IOT, Live video platform,Wearable devices,AR/VR

NB-IOT :

——Standards

- **Proprietary protocol standardization of Internet of things.**

——Industry planning

- **Spectrum license, network basic construction, large-scale utilization of industrial.**

——Network security

- **Public services are in wide connection.**

Live video platform

——Content regulation

——Privacy protection

——Platform rules

——Property protection

——Market competition

Wearable devices:

——Applicable scenarios

——Privacy protection

——Technological innovation

——Personal safety protection

AR/VR :

—Content regulation :

- **Prevent illegal content appearing, such as: pornographic, violent, horrible content.**

——Personal safety:

- **harm to human body (vision, nerves)**

——Property protection

4. IMT — 2020 (5G)

-----Eight Capacities defined by ITU

Peak data rate (Gbps)
Note:
General requirement :10Gbps
Particular scenario: 20Gbps

User experience data rate(Mbps)
Note:
Some scenarios: 1Gbps

Traffic volume density
(Mbps/m^2)

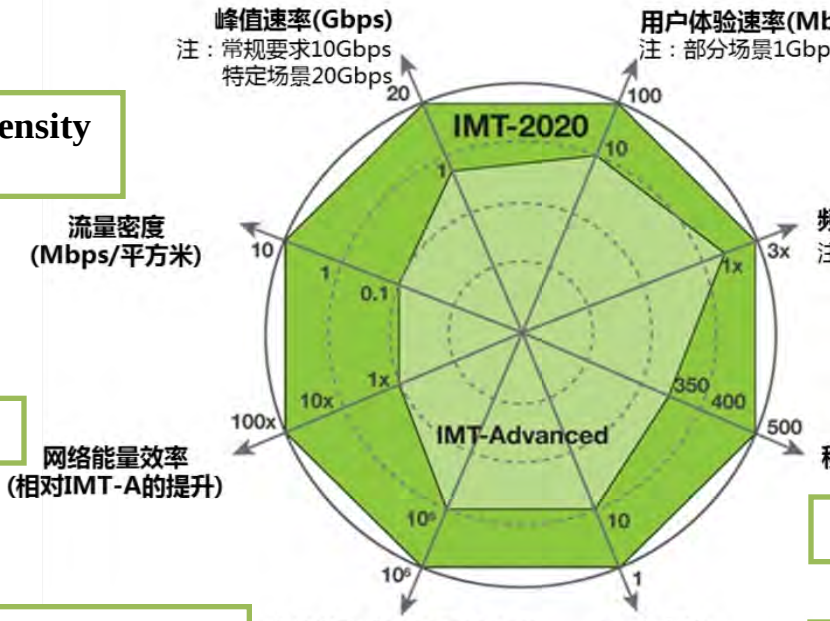
Spectrum efficiency
Note: 3 times increase; more than 3 times (e.g. 5 times) in some scenarios

Energy efficiency

Mobility (km/h)

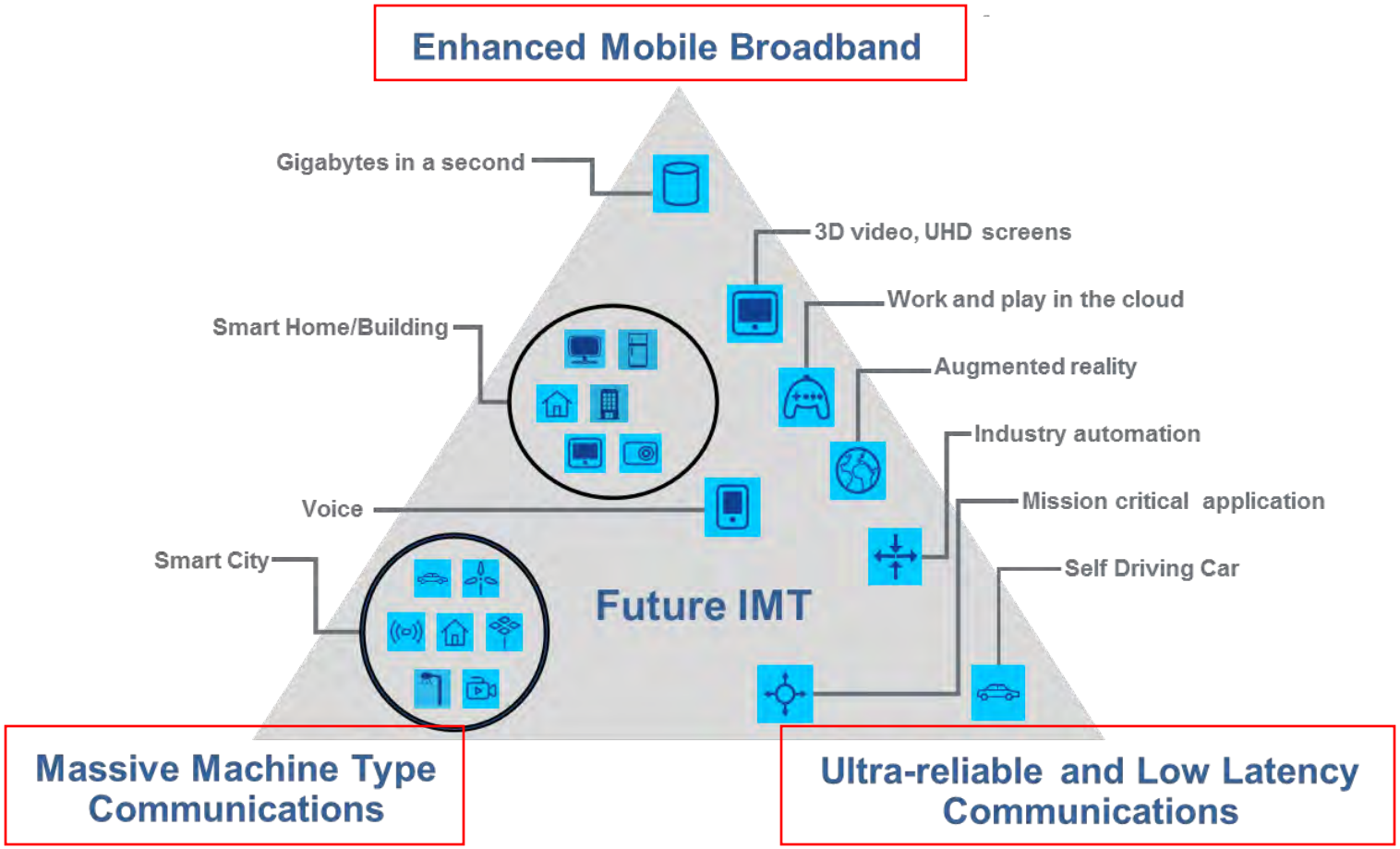
Connection density (/Km2)

Latency (ms)
Note: air interface



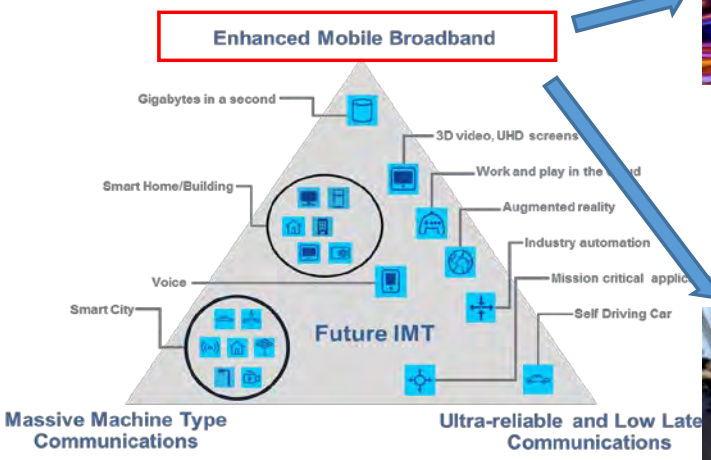
IMT Vision – "Framework and overall objectives of the future development of IMT for 2020 and beyond"

Usage scenarios for IMT for 2020 and beyond*



*Recommendation ITU-R M.2083-0, "IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond".

- **eMBB —— human-centric multi-media content, services and data**



wide-area coverage

- improved user data rate
- seamless coverage
- medium to high mobility

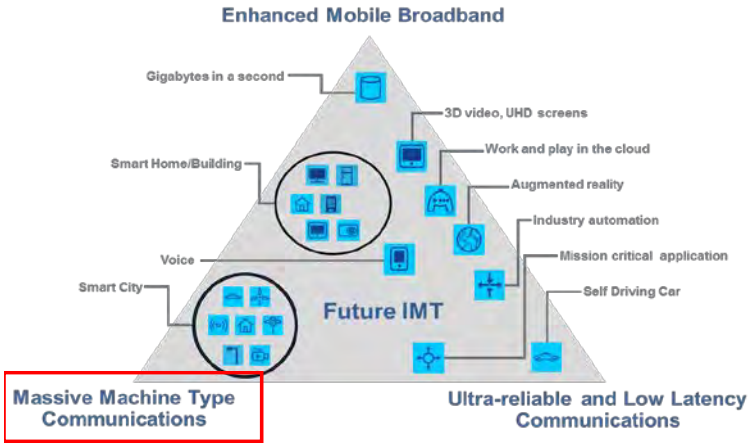
Prefer lower bands (e.g. <6GHz)

hotspot

- high user density
- very high traffic capacity
- low mobility

- Preferable higher bands
- WRC-19 AI 1.13 bands (24.25-86GHz)

● mMTC massive machine-type communication

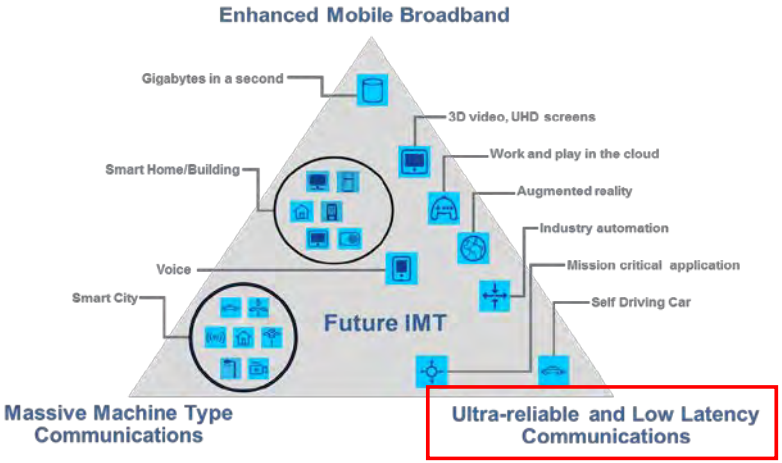


Massive machine type communications

- a very large number of connected devices
- transmitting a low volume
- non-delay-sensitive
- a very long battery life and low cost
- **NB-IOT is one possible solution**

- Possibly using 2G/3G/4G re-farming
- Preferable bands <1GHz

● URLLC Ultra-reliable and low latency communication



Ultra-reliable and low latency communications

- stringent requirements for capabilities such as throughput, latency and availability.

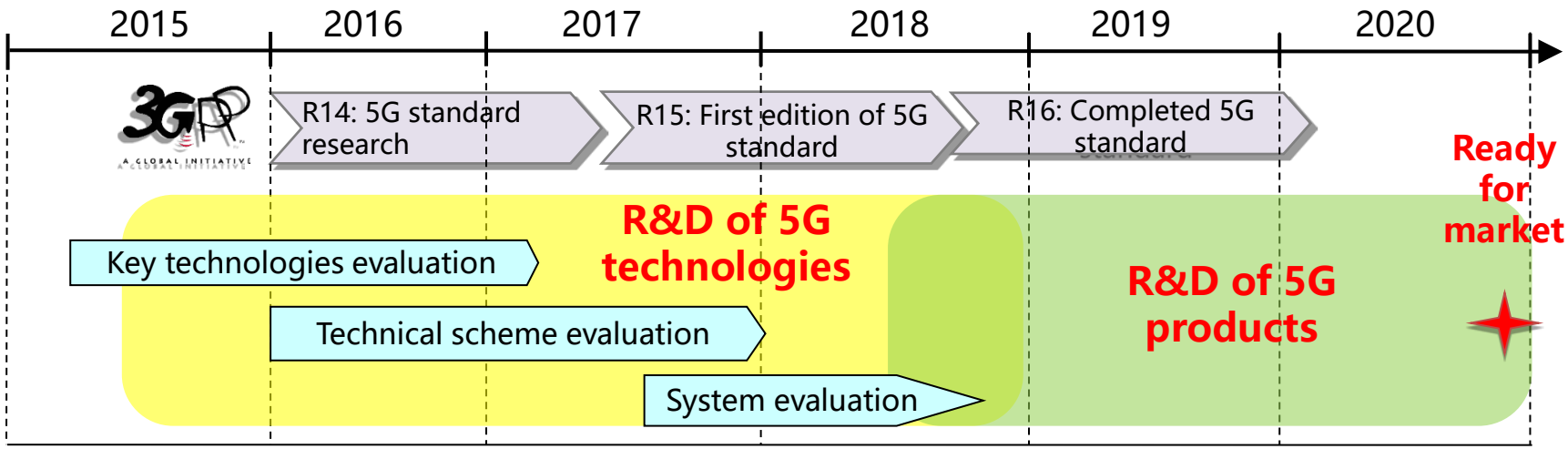
- Preferable dedicated bands

Principles for IMT Frequency Planning

- In accordance with "radio regulation", “Regulations on the frequency allocation" and so on. Consider international harmonization.
- Implement an overall consideration on the development of domestic and international radio service and technology. Carry out frequency planning research based on actual situation.
- Comprehensive consideration of all kinds of spectrum demand and EMC between different systems, to promote sustainable development of all radio services concerned .
  - Currently, 5G features (both for base stations and terminals) are not defined yet, which bring challenges for EMC studies.
- Support and encourage the development and operation of new services and technologies to improve spectrum efficiency.

4. 5G Technology Research and Development Test

- On January 7, 2016，China started the 5G technology R&D test, organized by IMT-2020 (5G) promotion group.
- Goal: to build an international test platform and support the development of global 5G standards.
- IMT-2020 (5G) promotion group has completed the first phase of specification of 5G key wireless technologies test, and part of the test project has also been completed.



4. Key Regulatory Points for 5G

Low frequency band (lower than 6GHz) is the basic frequency band for 5G

- Satisfy the user experience and allow massive equipment connection under large coverage and high mobility scenarios

High frequency band (higher than 6GHz) can meet the very high rate and large capacity requirements for 5G

- Meet the requirements of very high experience rate and large capacity for users in hot zone

- **Regulation key points:**

Aallocate different radio frequency spectrum for 5G. Release 5G commercial licenses. Network and information security. Technology standards. Global roaming of terminals,etc.

Thank you !