



# AI Use cases and Requirements for telecom network

China Mobile  
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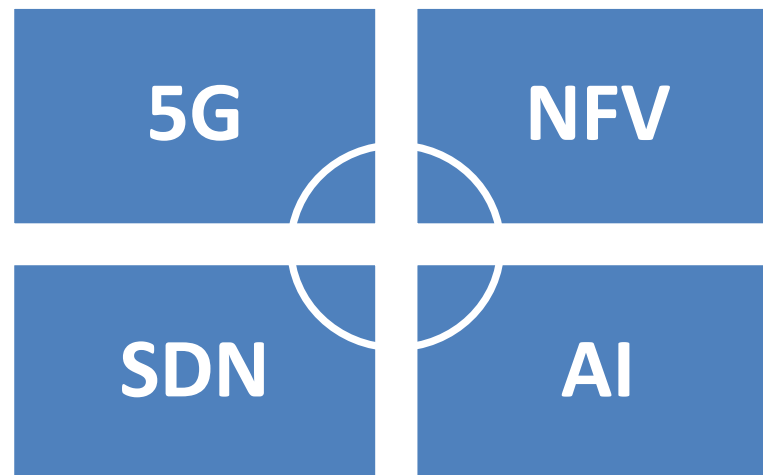
- Motivation to introduce AI
- Use cases in telecom network
- Requirements

CMCC Big  
Connect  
Strategy

To the future



Ovum observation:  
The future of the communication industry



Operators need to provide intelligent and dynamic on-demand services.

Smart decisions is necessary to manage complex resources and dynamic traffic.

In order to cope with the increasing complexity, improve the performance of network and reduce costs, Intelligent and automatic network operating is important.

## The four key factors of AI development: data, algorithm, computing and scenarios.

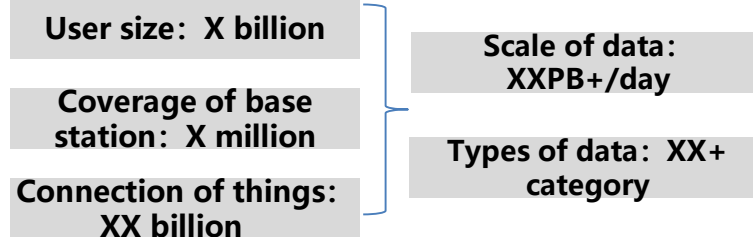
### Scenarios



- **Large Number of AI application scenarios in network operation, marketing, customer services, etc.**
- **5G, edge intelligent infrastructure and vertical industries** need AI technology.



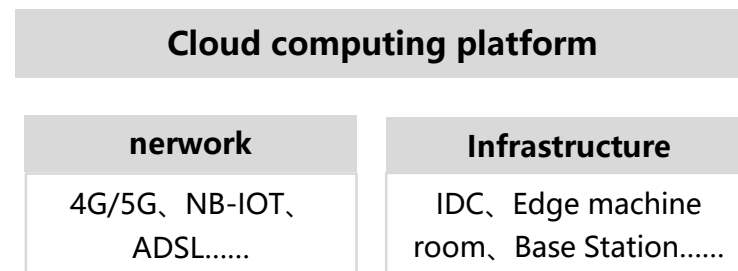
### Data



- **Multiple and high-quality big data**, such as real-time Internet logs, customer service corpora, will help the development of AI technology.



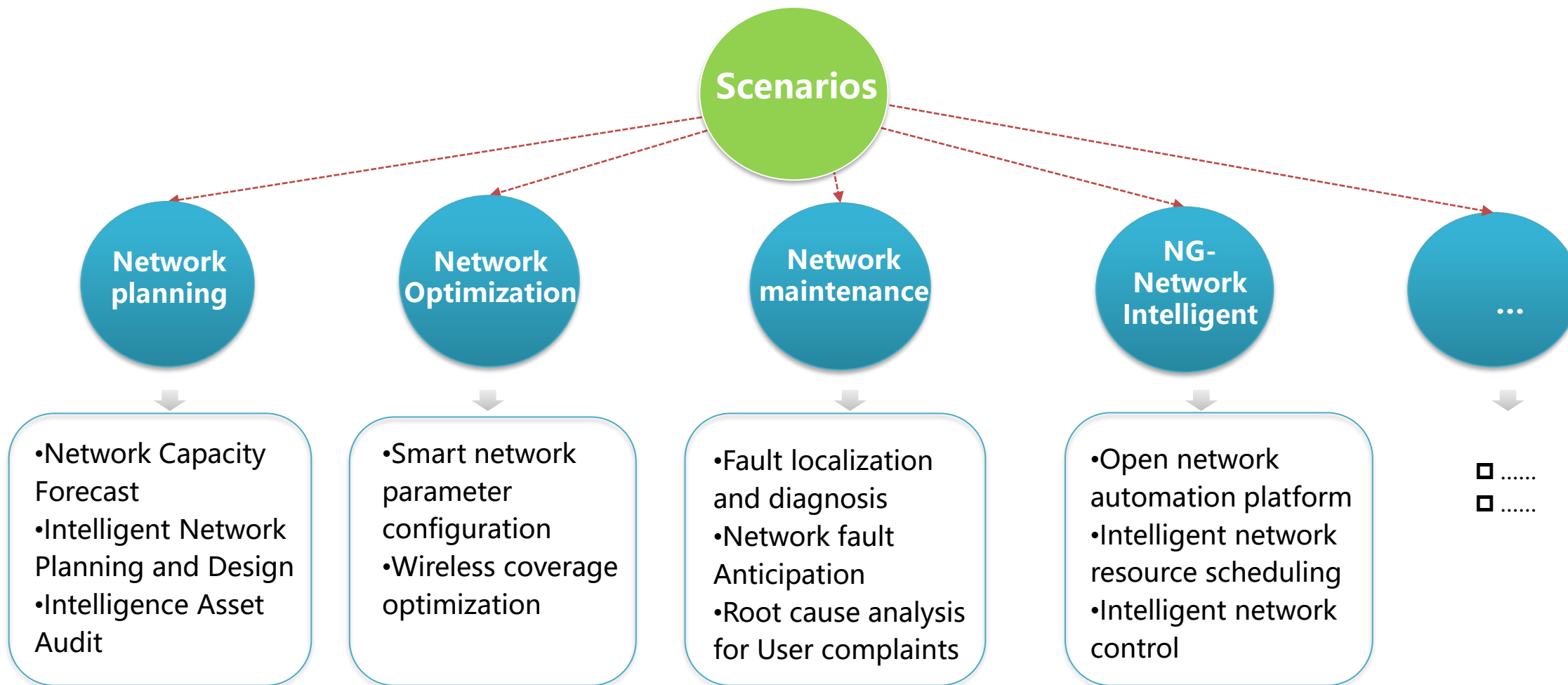
### Computing



- The large-scale "**cloudy**" infrastructure provides a powerful computing capabilities for AI development.
- **Edge computing** will accelerate the application of artificial intelligence in telecom network.



For Telecom operators, Artificial Intelligence technology is utilized to provide intelligent, efficient and dynamic telecommunication network operation capabilities.



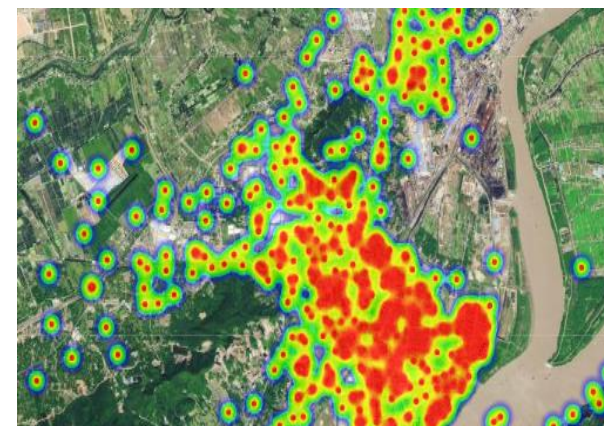
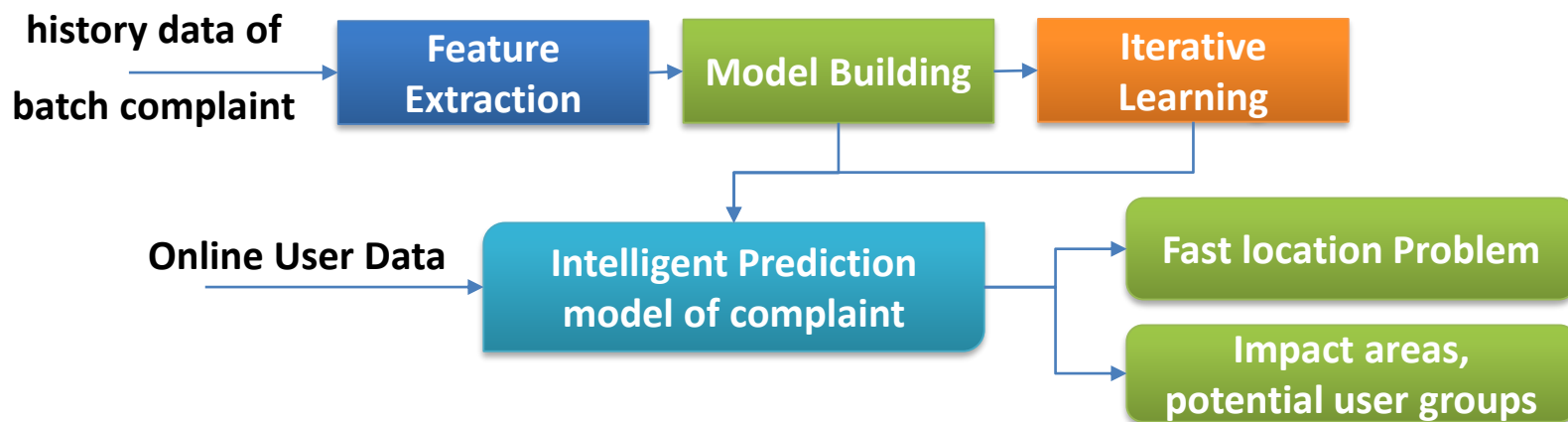
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Low timeliness efficiency of batch complaint handling

2

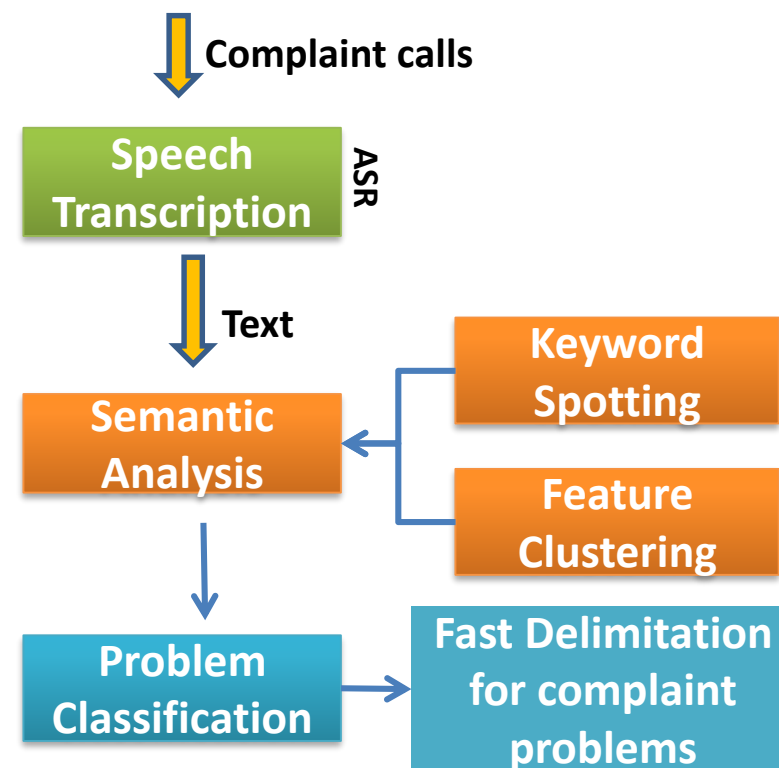
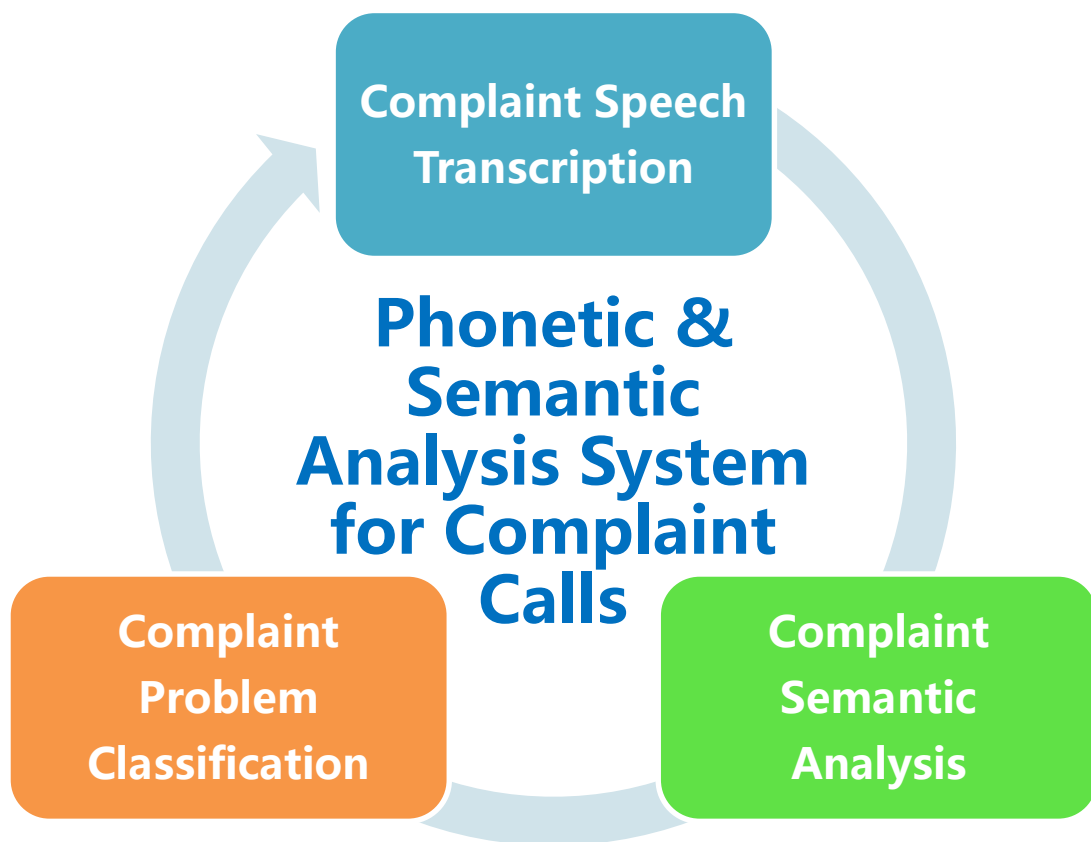
Low accuracy of batch complaint handling

It is necessary to introduce artificial intelligence algorithm in batch complaint handling. Through extracting the characteristics of control-plane signaling and user-plane data of complaint user, based-on machine learning complaint problem can be located rapidly, and the potential impact area, user groups will be obtained in time. Customer care will be done ahead of complaint to improve user experience.



## 2. Phonetic & Semantic Analysis for Complaint Calls

- In order to support complaints root cause analysis, an automatic classification system is constructed based on the full amount of complaint calls, through the deep learning based speech transcription and language understanding techniques.



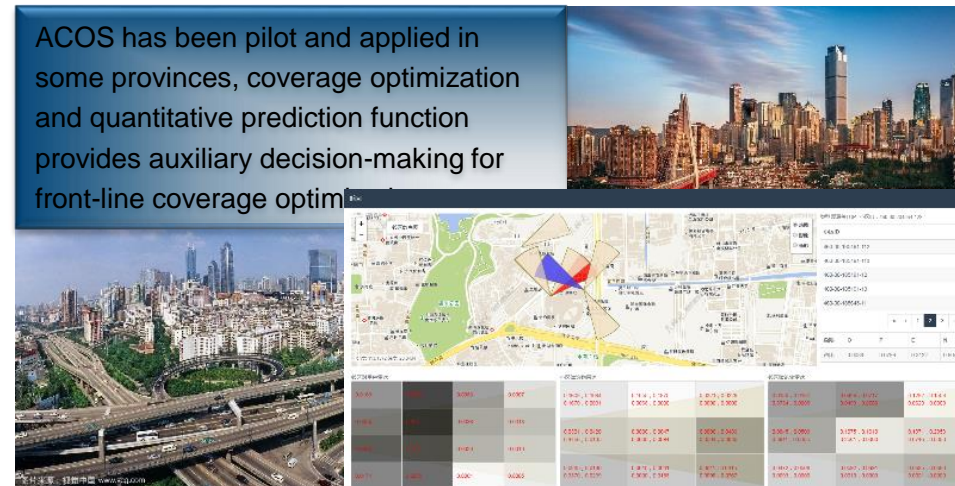
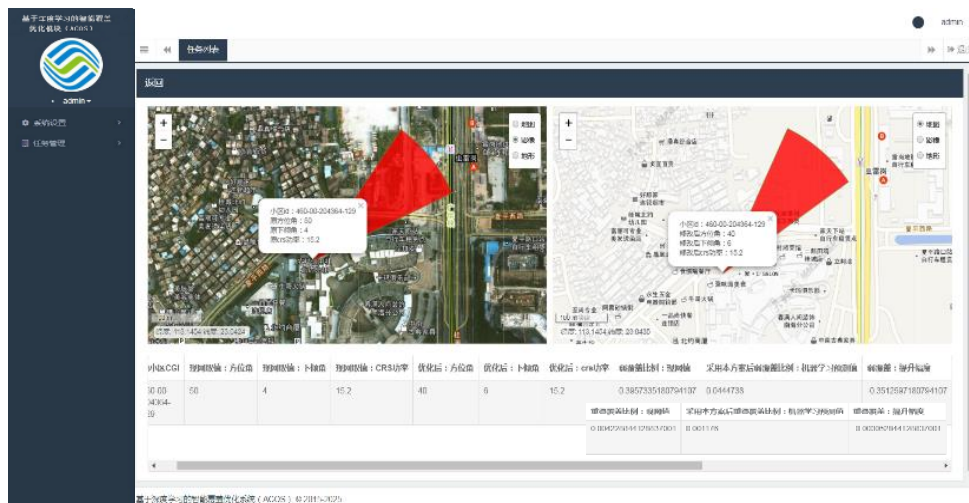
# 3、Wireless coverage optimization

**background:** Weak coverage and over coverage are the major causes of poor network quality. It takes a large amount of manpower and material to optimize them. Timeliness cannot be guaranteed.

ACOS: AI-based Coverage Optimization System.

Output: Optimization suggestions, effect prediction.

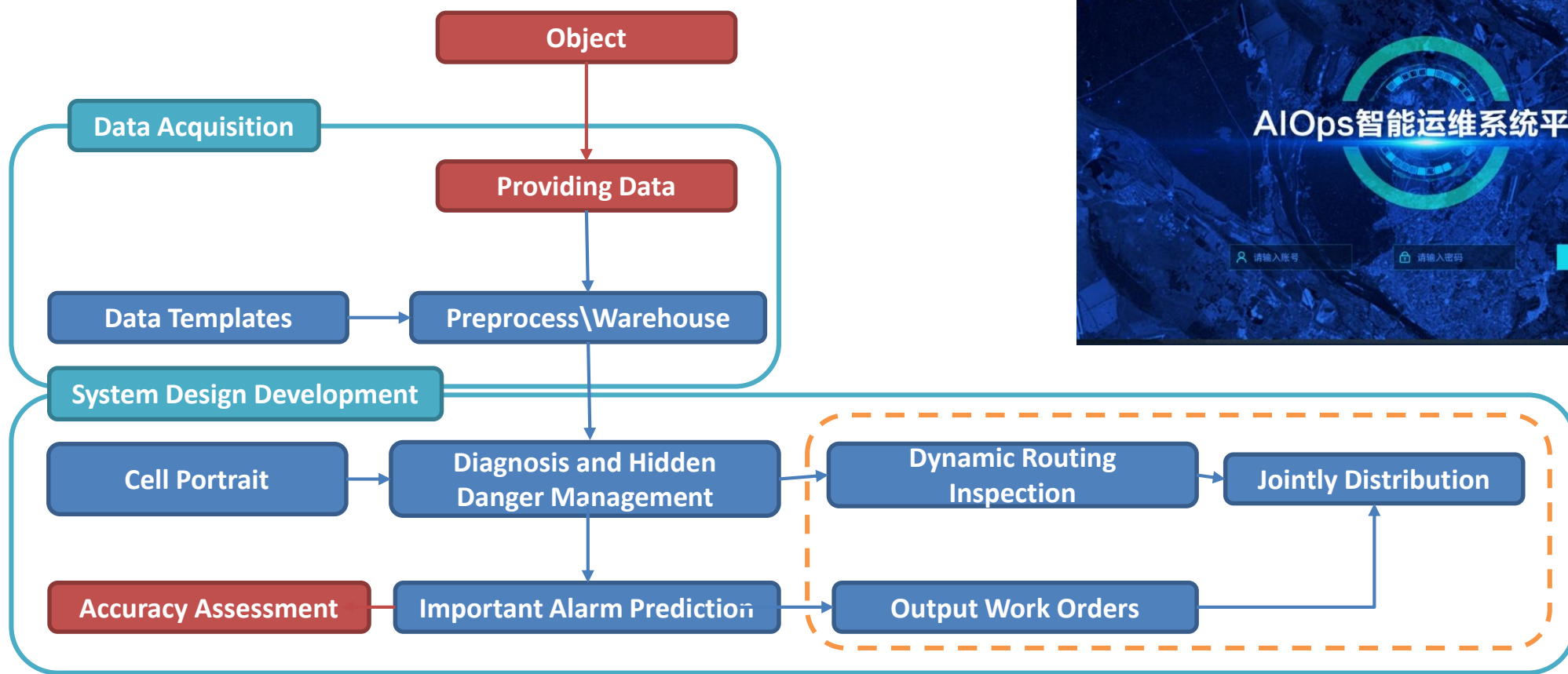
- **Step1 Top N cells coverage analysis:** Analysis of the problem cell, Give qualitative suggestion
- **Step 2 coverage index predict:** Dynamic input power, direction angle and tilt angle adjustment to realize quantitative prediction of coverage index (based on depth learning)





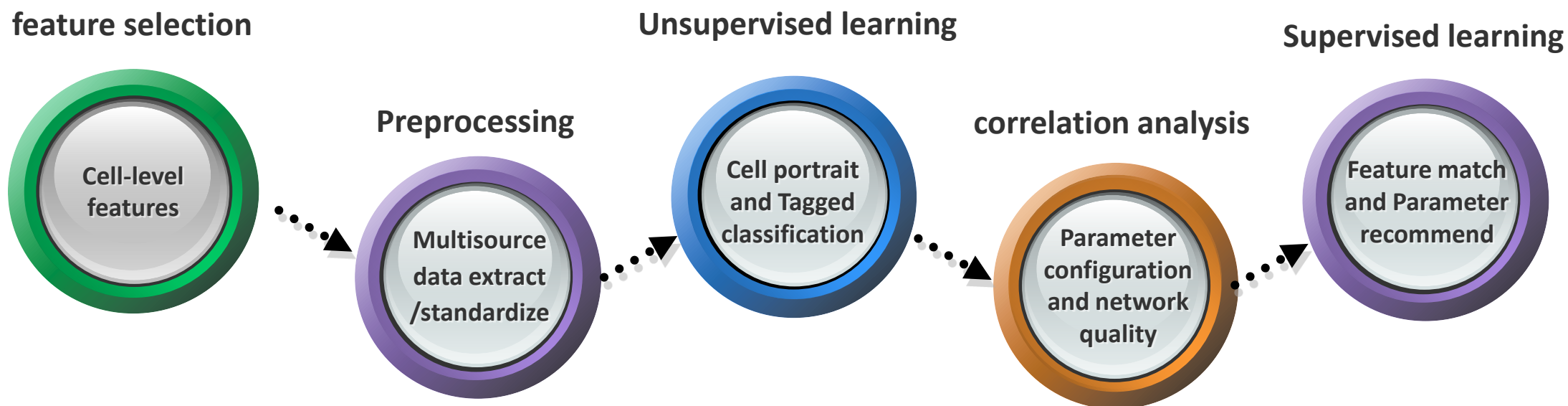
# 4、 Intelligent operation of wireless sites

Through the realization of site portrait and performance-related alarm mining, Network failure point can be discovered as soon as possible to maximize the ability to settle problems in advance.



# 5、 Intelligent network parameter configuration

- **background** : Parameters Configuration is the most frequently modified content of daily network optimization. How to obtain the proper configuration parameters is pretty important to improve network performance and user perception.
- **system function**:
  - 1. Preprocessing and feature analysis on massive network data.
  - 2. Quantitative Scene Recognition based on Fine Features.
  - 3. Automatic configuration of network optimal parameters.



# 6、Machine learning based intelligent network service identification

- This ML based intelligent system can identify the network service categories **efficiently, actively and accurately**, even when the services/applications use **HTTPS** protocol or **private protocol**
- **Joint test** with the DPI system **is already completed**, **field trial** will first start in Zhejiang at the end of **April**, and trials in Beijing, Jiangsu, Fujian ,etc., will be finished by the end of **September**

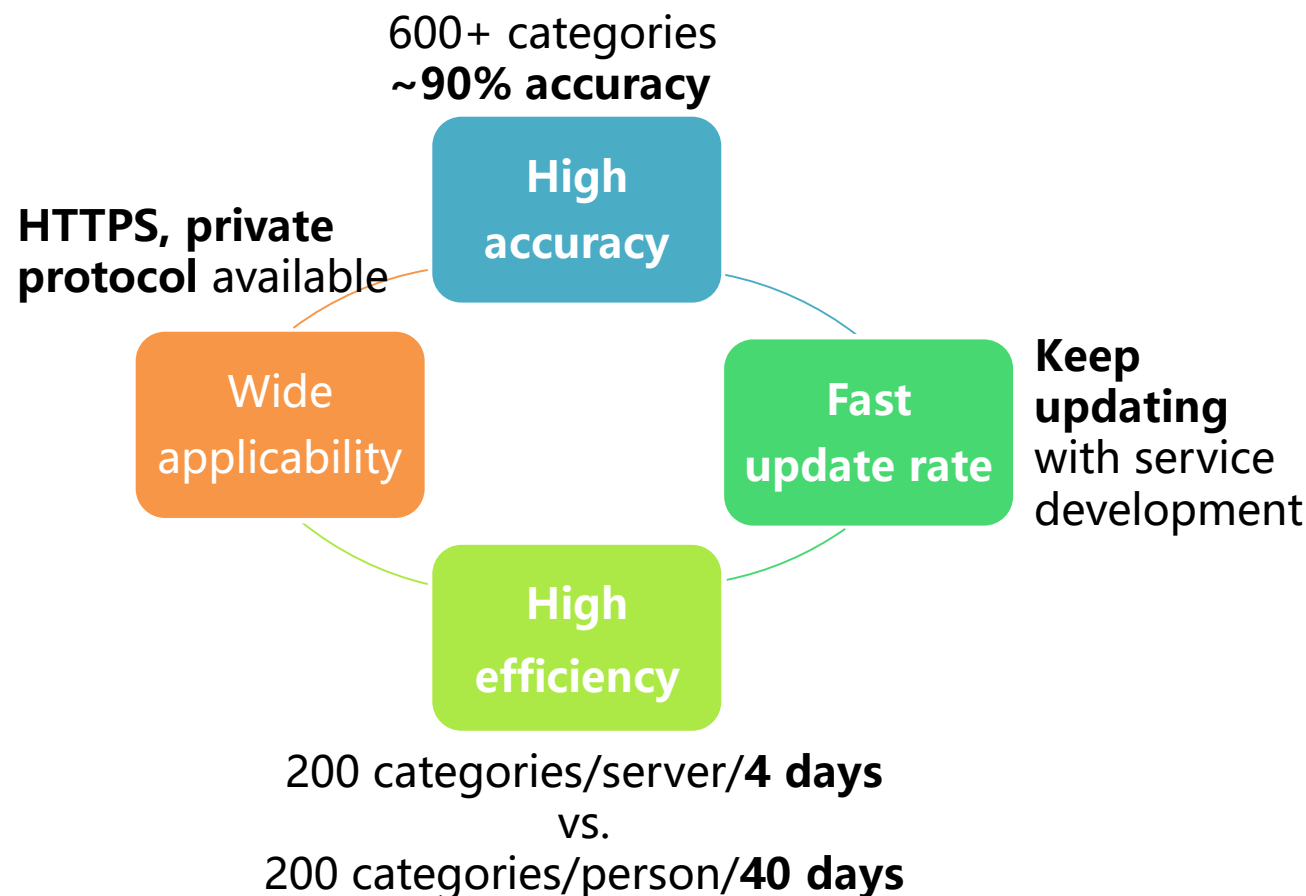
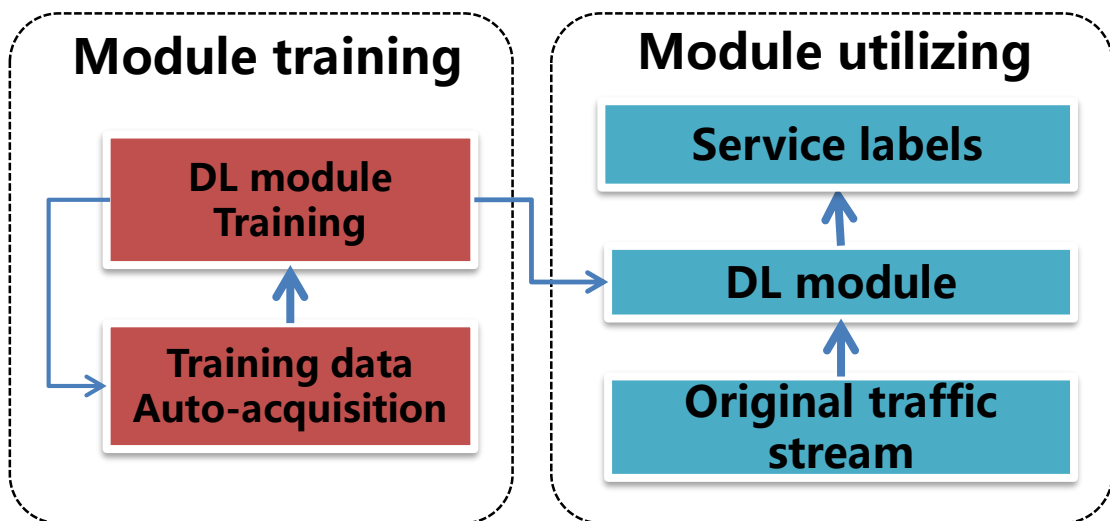
## Characteristics build manually

- Low efficiency
- Low update rate
- Limited usability

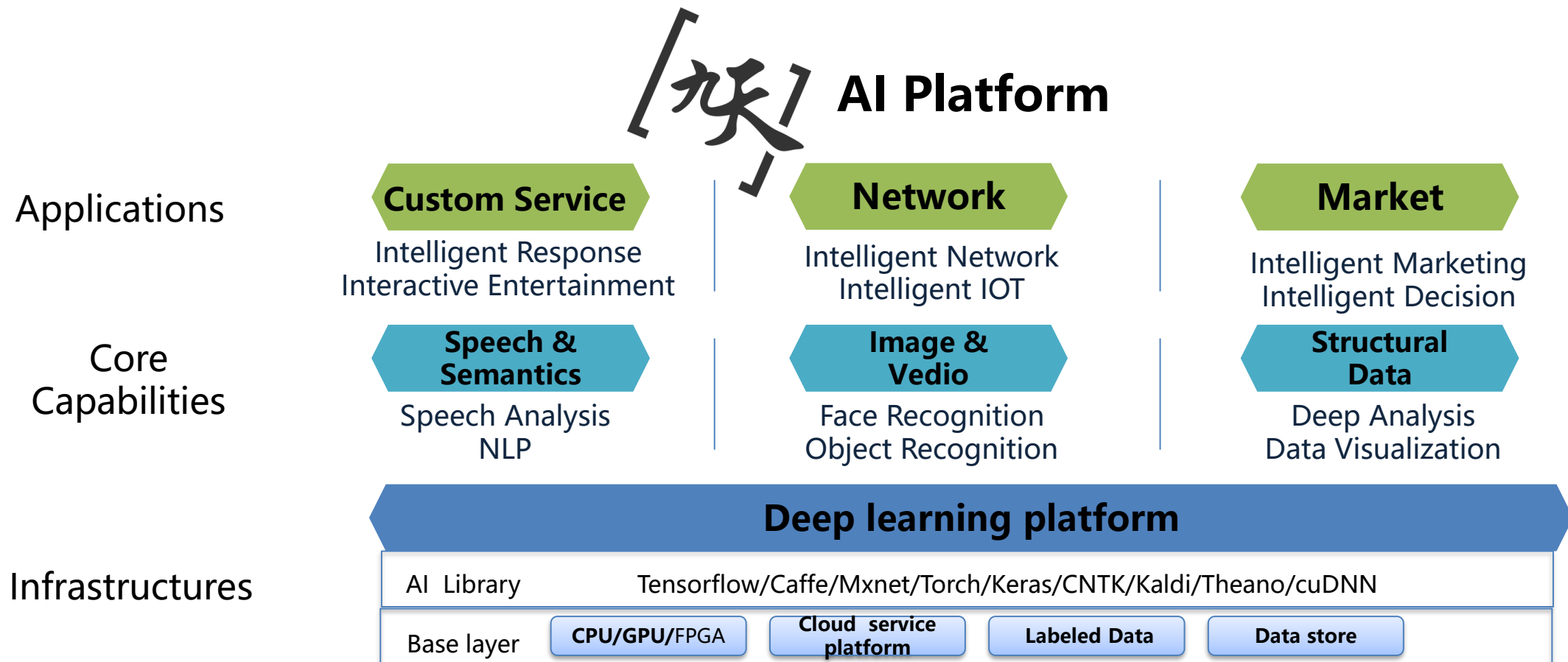
VS

## ML based identification

- **Active learning**
- **Intelligent identify**
- **Efficient & accurate**

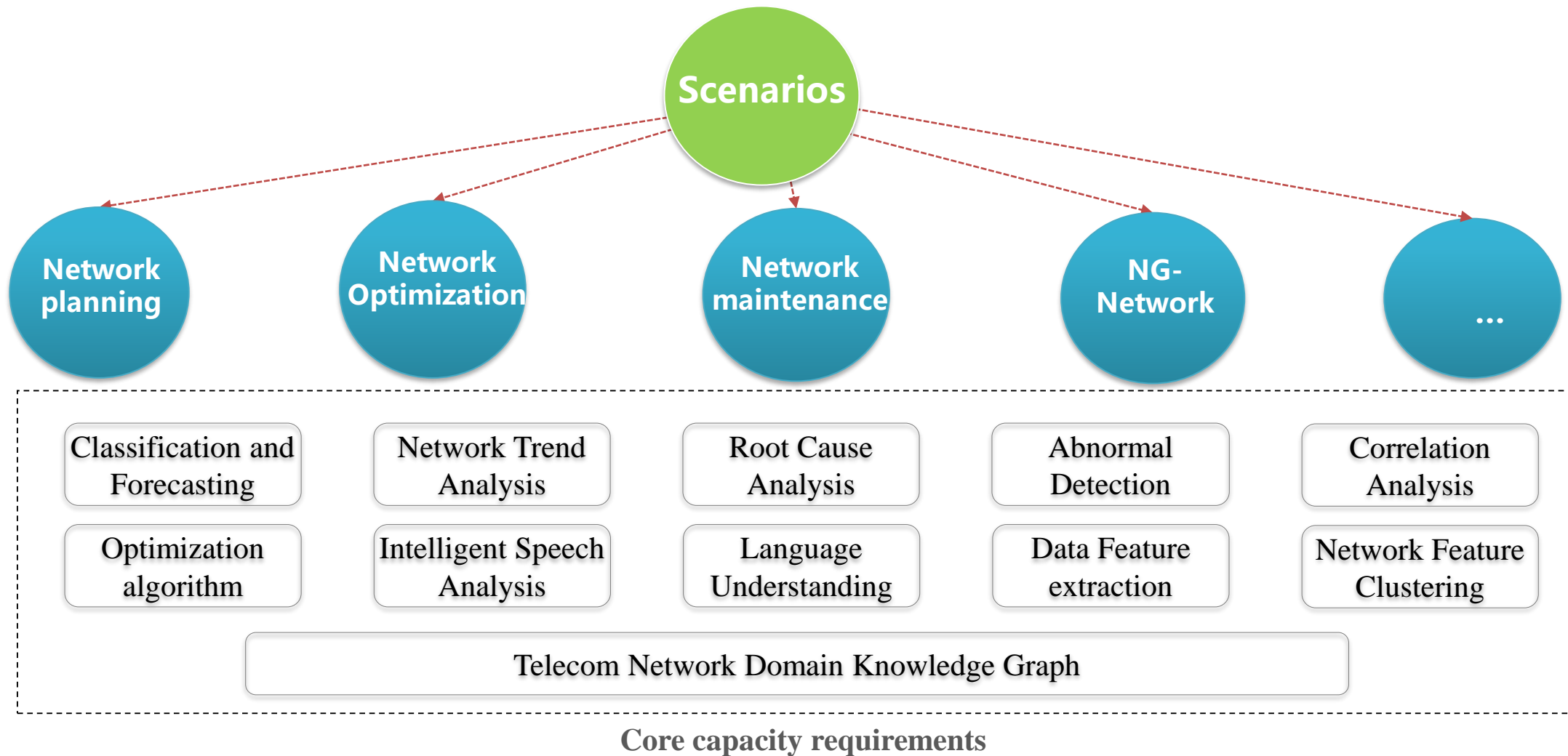


Focus on Telecom scenarios, open AI services are provided from basic platform to core capabilities



AI core capabilities API, SDK services and AI infrastructure are provided to China Mobile R & D institutions, vertical industries and eco-industrial chain.

There are large number of AI applications in telecom scenario, and the value of “telecom + AI” is huge. But it is still in its infancy, General capabilities and models for the telecom industry are needed to develop.





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**Thank you!**

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