

认知物联网 助力工业智能化发展

Cognitive IoT(CIoT) A Smart Future for Industry

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工业互联网发展三阶段

Three Period of Industrial Development

- **智能制造?** INTELLIGENT MANUFACTURING

将传统工业软件应用到制造业，强调机器的自动化功能

Emphasis on the automation of the machine

- **互联网+工业** INTERNET+INDUSTRY

将互联网工具应用到制造业，强调供需系统的对接

Emphasis on the docking of supply and demand systems

- **人工智能+制造** AI+INDUSTRY

将人工智能技术应用到工业，核心在于机器是否自动反馈和调整

Machine feeds back and adjusts automatically



企业智能化水平仍需提升

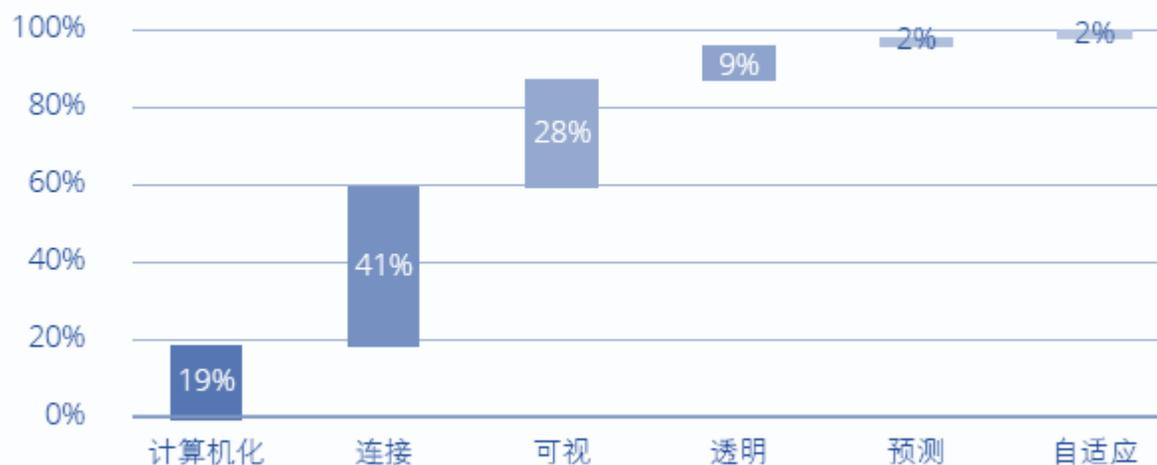
The level of enterprise intelligence still needs to be improved

企业智能化成熟度分为六个阶段：计算机化、连接、可视、透明、预测和自适应。随着中国两化融合和工业物联网建设等举措推进，制造型企业数字化能力素质显著提升，但预测和自适应阶段的企业仅各占2%。

Enterprise intelligence maturity is divided into six phases: computerization, connectivity, visualization, transparency, prediction, and adaptation. Recently, the digital capabilities of manufacturing enterprises have improved significantly, but only 2% of enterprises in the forecasting and adaptive stages.

图1.2 受访企业所处阶段（基于企业自我评估）

受访企业工业4.0所处阶段



数据来源：德勤智能制造企业调研 2018

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如何实现智能化？

HOW TO BE INTELLIGENT?

连接

CONNECTION

管理

MANAGEMENT

智能
管理

INTELLIGENT
MANAGEMENT

连接是基础

STEP ONE: CONNECTON



移动互联

MOBILE INTERNET



万物互联

INTERNET OF EVERYTHING



万物智联

INTELLIGENT CONNECTION

5G高并发、实时、高可靠、带宽高、终端容量大，提供更强网络性能
5G产业生态与各行各业开展联合创新，探索新机遇、新模式、新商业

5G WILL HELP TO DISCOVER NEW OPPORTUNITIES, NEW MODELS, NEW BUSINESSES

数据是资产财富

STEP TWO: MANAGEMENT



实现设备的实时监控、可视化管理

MANAGEMENT



数据采集与存储

DATA COLLECITON
& STORAGE



TERMINAL



China
unicom 中国联通
创新·改变世界

人工智能是发展新引擎

STEP THREE: INTELLIGENT MANAGEMENT

AI+IoT

转变为数据驱动的平台应用新范式

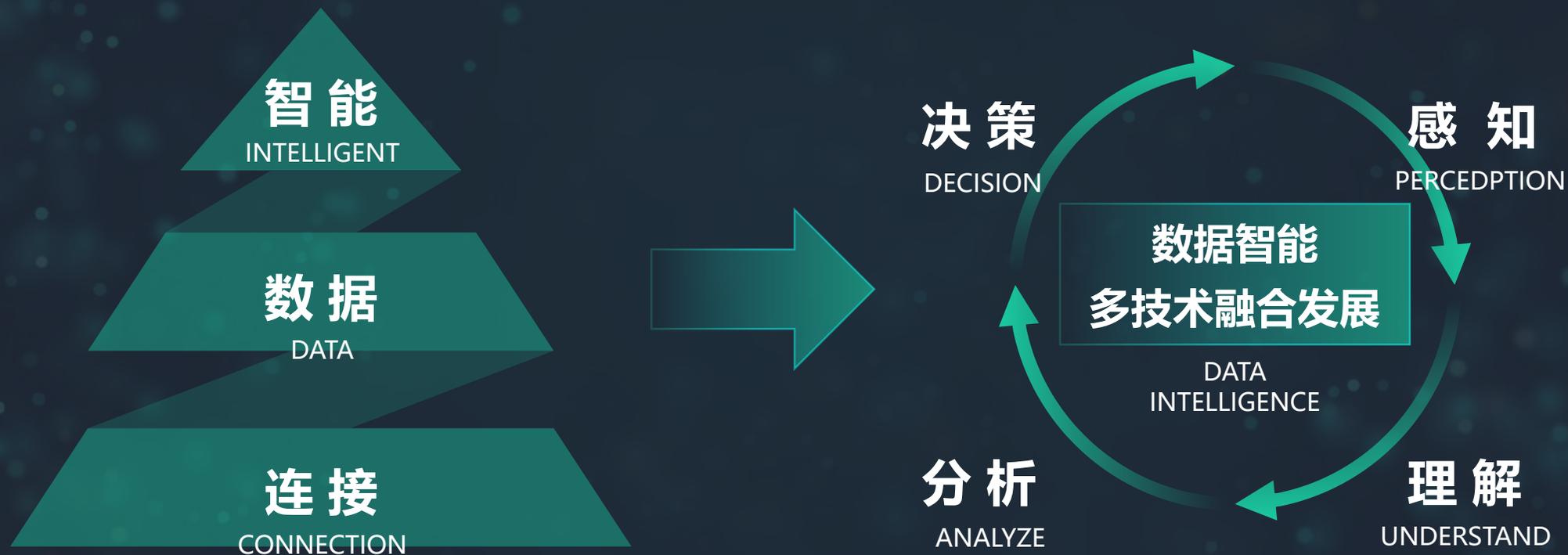
为工业企业提供基于数据的新技术、新方法、新服务、新价值

智能
管理

INTELLIGENT
MANAGEMENT

实现设备的智能管理

INTELLIGENT MANAGEMENT





China unicom 中国联通
创新·改变世界

联通认知物联网整体布局

CU IoT PLATFORM

应用

数据中台

资源基础

网络

终端



云计算能力

- 身份识别
- 证书管理
- 区块链
- 负载均衡
- CDN
- DevOps

云：夯实万物互联基础 Cloud

“M+1+N” 云数据中心体系

Cloud data center system

覆盖全国335个数据中心

Data Center Resources

- 12个国家级数据中心
- 总面积 > 200万平米
- 全国总机架 > 32万架
- 总出口带宽 > 60T
- 覆盖38个资源池节点
- 12 national data centers
- Total area > 2 million square meters
- National total rack > 320,000
- Total export bandwidth > 60T
- Covering 38 resource pool nodes

M: 集团级战略/核心基地

1: 省级DC (省会/重点城市)

N: 综合业务承载节点

L: Group-level strategy / core base

1: Provincial DC (provincial/key city)

N: Integrated service bearer node

多云服务

Multi-Cloud Service



- 公有云、私有云、混合云
- 支持主流云服务

Public cloud, private cloud, hybrid cloud
Support for mainstream cloud services

网：构建万物互联桥梁

Internet

全网部署成熟商用

2/3/4G、全光网络

Full network deployment & mature commercial

大力推进商用部署
积极开展业务测试

NB-IoT (覆盖全国)
eMTC、5G

Commercial deployment & business testing

开通试验网

上海等7特大城市 (城区连续覆盖) 7 Megacities

+

33大城市 (热点区域覆盖) 33 Metropolis

+

N行业应用 (定制5G网中专网) Industry application



平台：行业领先 全面使能

CU IoT PLATFORM

连接管理平台

Connection management platform

连接管理能力更新迭代，满足多种运营需求的统一平台、支持“全球连接”。

Update and iteration of connection management ability to meet the unified platform of multiple operational requirements and support "global connection"

新一代物联网连接管理平台全面支持5G大带宽业务

New generation of connection management systems fully support 5G services.



蜂窝连接管理通用子系统

Cellular connection management common subsystem



蜂窝连接管理安全子系统

Cellular connection management security subsystem



非蜂窝连接管理

Non-cellular connection management



自动化
生命周期

Automated life
cycle



可靠
安全防护

Reliable safety
protection



可视化
便捷管理

Visual and convenient
management



轻松
全球部署

Global
deployment



无缝
后端集成

Seamless
integration

平台：行业领先 全面使能

CU IoT PLATFORM

设备管理平台

Device Management

Telit



arm

Ayla Networks

工业设备

Industrial equipment

公共事业

Public utilities

端到端安全

End-to-end security

智能家居

Smart home

设备
管理

Device Management

规则
引擎

Business Rules engine

API
开放能力

API Exposure

安全
能力

Security capability

工业网关
边缘计算

edge computing

平台：行业领先 全面使能 CU IoT PLATFORM



设备管理平台 Device Management

Telit 工业设备

Industrial Equipment

工业设备快速接入、强大的第三方交互能力、丰富的多种PLC接入、高速现场数据处理能力

Industrial equipment quickly, Rich PLC Access, High-speed field data processing

arm 端到端安全

End to end Security

便捷部署、从设备到数据的安全及大规模创新

Convenient Deployment, Device and data security, large scale innovation

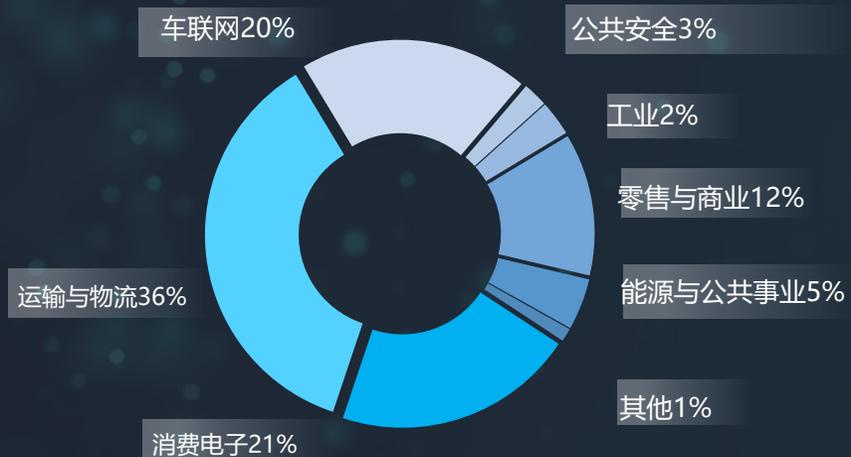
联网上云、效率需求、成本压力是客户迫切解决的核心痛点

设备管理能力为客户提供设备连接管理、应用开发，协助客户开发高价值的物联网应用，实现物联网设备快速部署。

The equipment management ability provides equipment connection management and application development for customers, assists customers in the development of high-value iot applications, and enables rapid deployment of iot devices.

中国联通物联网业务飞速发展

Business Development



1.2亿连接

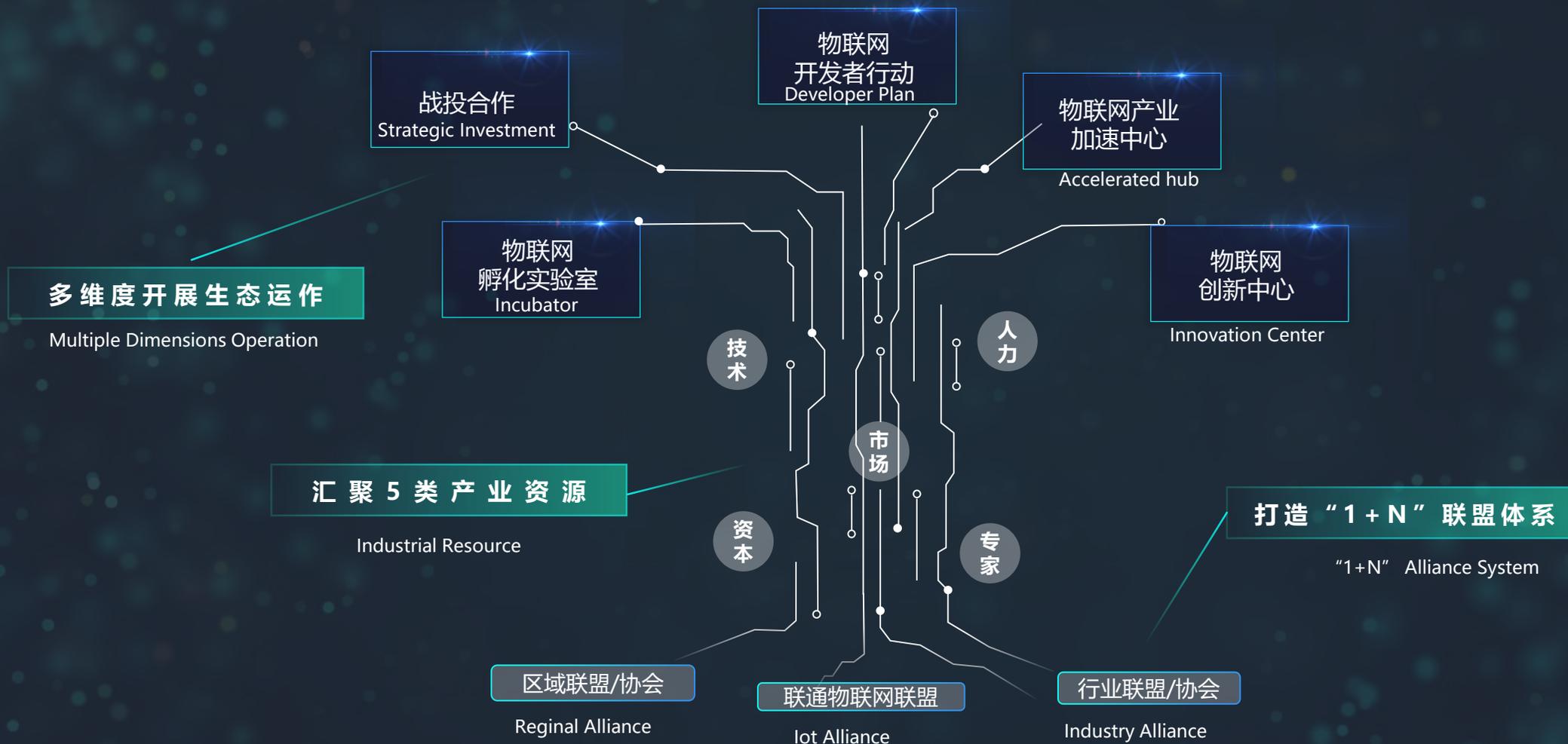
120 million connections

2万户行业用户

20,000 industry customers



生态：打造联通物联网智慧大生态 Ecology



以联盟为载体、汇聚产业各方资源，多维度开展生态运作，打造认知物联网大生态！

打造智慧工业服务平台

Create a Smart Industrial Service Platform



未来物联网大会——物联网不仅仅是连接

共建工业物联产业 助力企业数字化转型

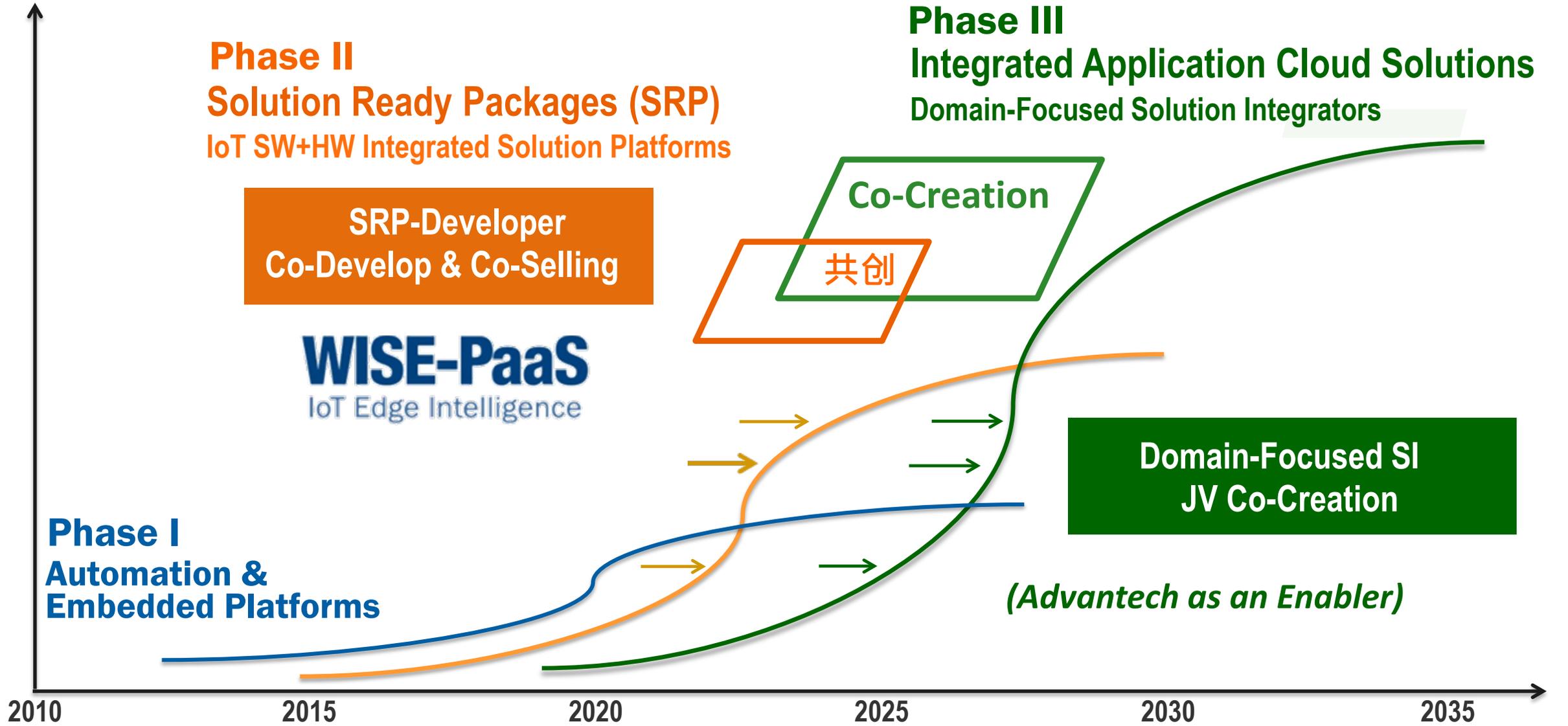
许杰弘

研华（中国）IoT嵌入式平台事业群 总经理

2019.6.26



Advantech AIoT Long Term Co-Creation Business Model



WISE-PaaS 3.0 AIoT Edge-to-Cloud Architecture

Integrated Application Cloud Solutions
(SaaS Partners & DFSI)



Co-Creation

End To End Security: SSL/TLS

AIoT.SRPs	SR Situation Room	PHM Prognostic Health Management	AOI AI-based AOI	IVA Video Analytics
	OEE Overall Equipment Effectiveness	EQM Environmental Monitoring	EMS Energy Management	More More SRP co-created

PaaS Cloud Services

WISE-PaaS/ EnSaaS

RESTful API

Node-RED

<p>Visualization - Dashboard</p> <p>WISE-PaaS/SaaS Composer HTML5 Canvas WISE-PaaS/Dashboard Streaming Data 3D Visualization Grafana</p>	<p>Asset Performance Management</p> <p>WISE-PaaS/APM Asset Models Asset Statistics & Analytics Workflow Integration</p>	<p>AI Framework Service</p> <p>WISE-PaaS/AFS Online Code IDE Online Flow IDE Model Training & Deploy TensorFlow GPU Caffe ONNX</p>
<p>Compute Resource Management</p> <p>kubernetes CLOUD FOUNDRY Micro-services Elastic Scaling High Availability</p>	<p>Database & Storage Services</p> <p>PostgreSQL mongoDB influxdb ceph IoT Hub RabbitMQ kafka</p>	<p>Customer Management</p> <p>Multi-tenancy Metering & Billing Single Sign-on</p>
<p>Public Cloud</p> <p>腾讯云 WeCloud Azure aws 阿里云</p>		<p>Private Cloud</p> <p>openstack.</p>

MQTT/AMQP

<p>Industrial SCADA</p> <p>WebAccess/SCADA</p> <p>WebAccess/CNC WebAccess/HMI WebAccess/NMS</p>	<p>Machine to Intelligence</p> <p>WISE-PaaS/DeviceM+ WISE-PaaS/EdgeLink</p> <p>Protocol Conversion Sensor Management Device Model</p>	<p>Remote Device Management</p> <p>WISE-PaaS/DeviceOn WISE-PaaS/EdgeSense</p> <p>WISE-PaaS/RMM WISE-PaaS/OTA WISE-PaaS/Security</p>	<p>Video Management</p> <p>WISE-PaaS/VideoSense</p> <p>WISE-PaaS/VideoService WISE-PaaS/SignageCMS WISE-PaaS/HumanDetectAI</p>	<p>Embedded Android & Linux</p> <p>AIM-Android/AIM-Linux</p> <p>Device Service API Industrial Peripherals Multi-SOC</p>	<p>EDGE X FOUNDRY</p> <p>Edge Analytics Microservices Edge Connectivity</p>
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携手中国联通共创工业互联网新未来

Co-Creation a new future of industrial IoT with China unicom

云

Cloud Service



管

Network Service



4G/5G CPE/Router



SD-WAN

Edge Intelligence



边缘计算/网关类 系列产品
Gateway/Edge computing

端

IoT sensing Device



充电桩

Charging pile



电梯

elevator



马达

motor



发电机

generator



空压机

Air compressor



CNC数控机床

CNC



工业空调

Industrial air conditioning



风电

wind electricity



特种车

Special vehicle



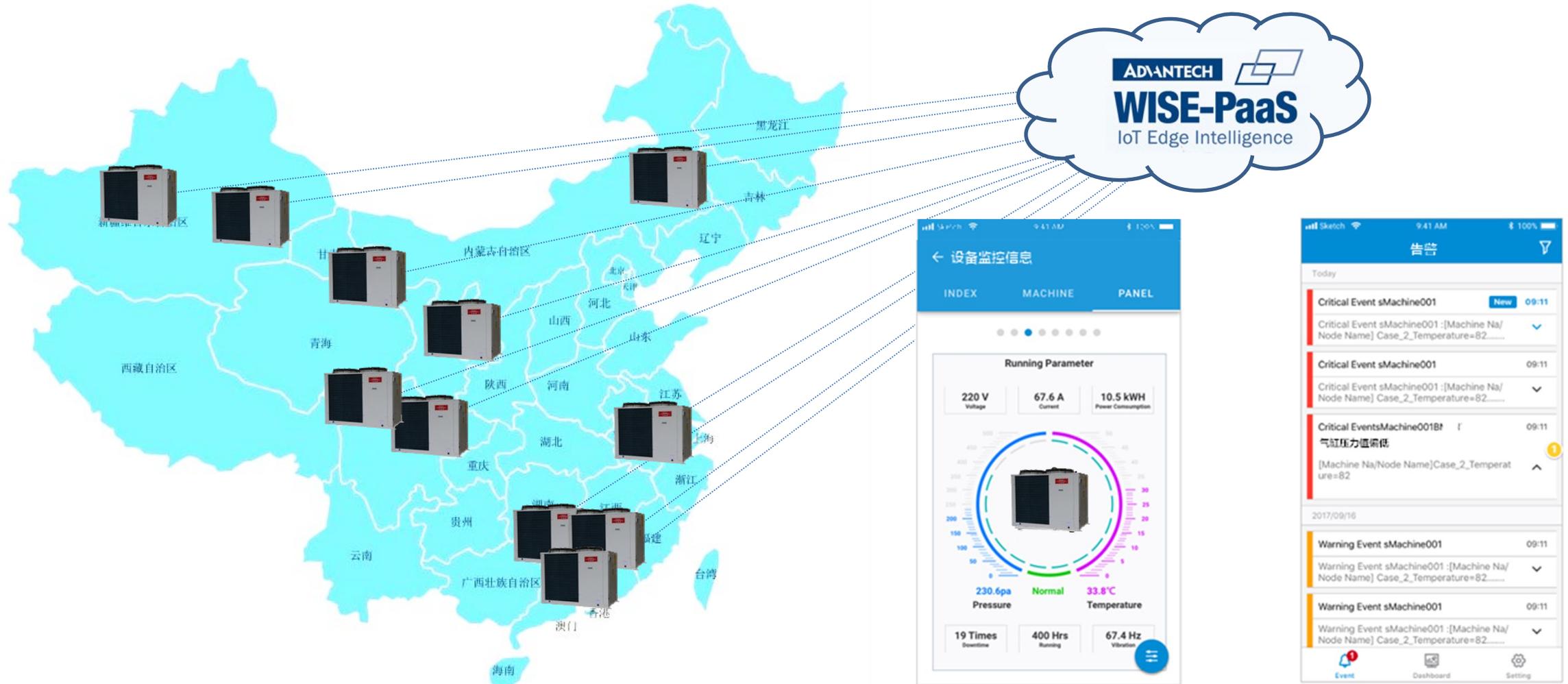
光伏

Solar

ADVANTECH

案例1：中央空调远程运维系统项目

Central air conditioning remote operation and maintenance system



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Central air conditioning remote operation and maintenance system

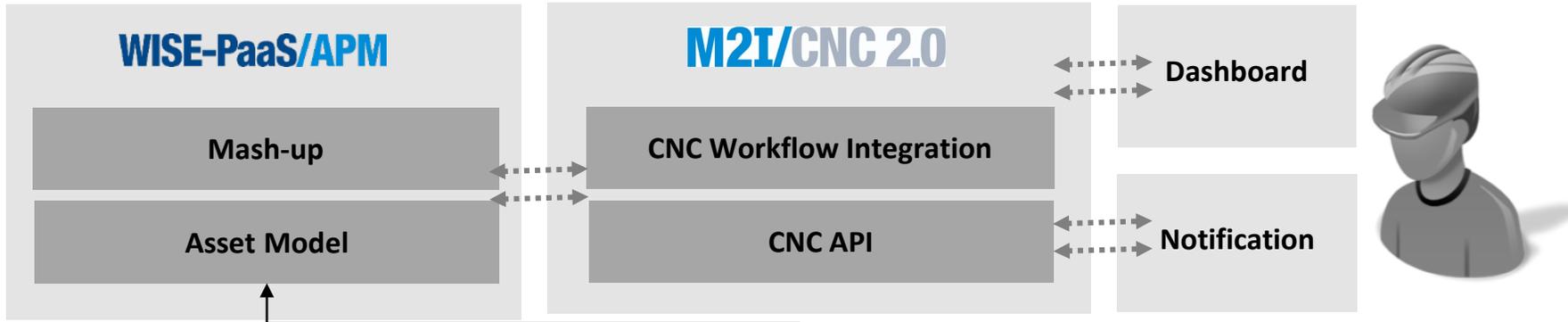


案例2：CNC设备5G联网解决方案

5G networking solutions of CNC

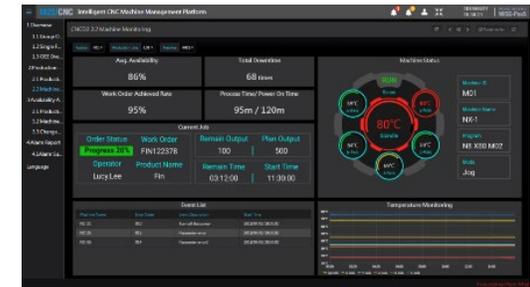
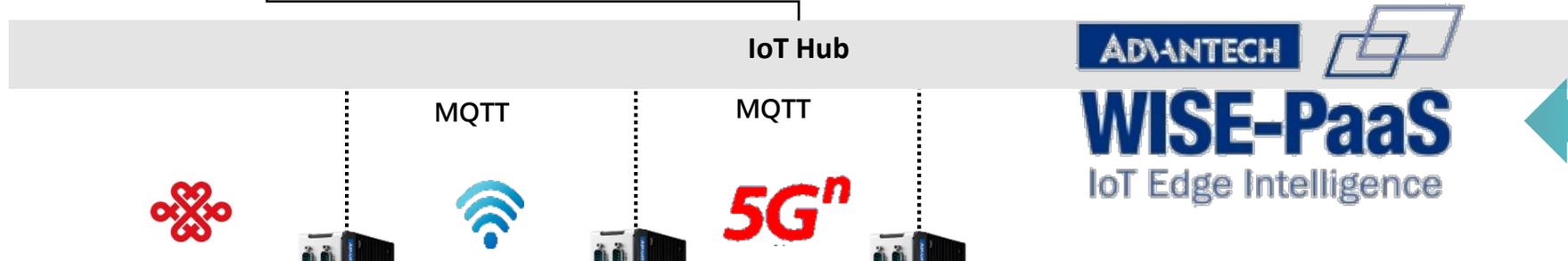
Real-time production line process monitoring

即时产线加工监控



Real-time machine processing monitoring

即时机台加工监控



警报统计

Alarm statistics



CNC机台：2000台



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