Empowering Verticals with Low Carbon, Shaping a Greener future together

ZTE DigitalNebula®

ZTE Corporation

2024.12.11

Four Pillars of ZTE Green and Sustainability Strategy

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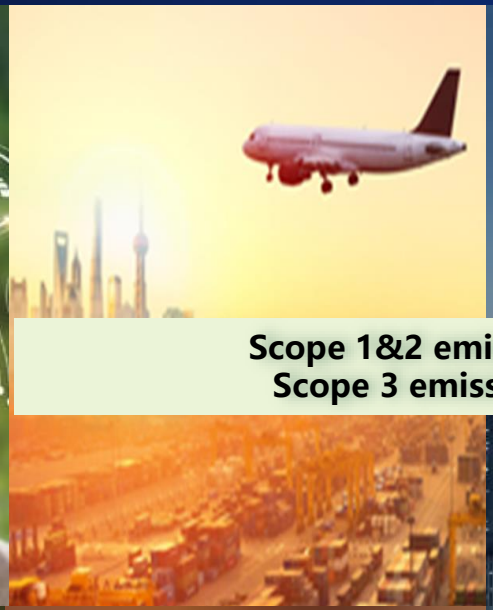

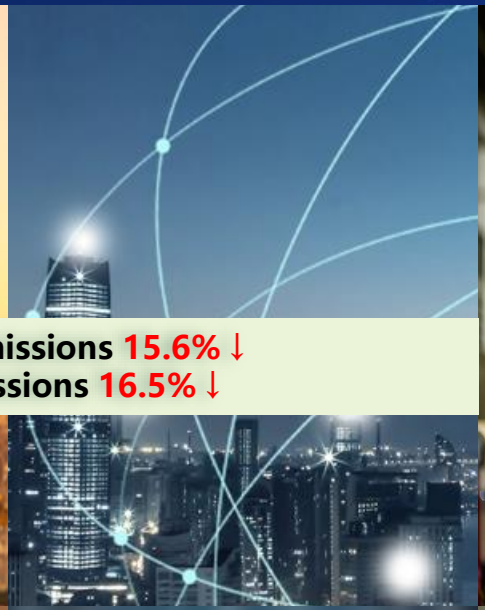

Scope 1&2 emissions 15.6% ↓
Scope 3 emissions 16.5% ↓

Green campus
Green manufacturing, office and R&D
Green ecology

Green Operation

Green procurement
Green logistics & recycling

Green Supply Chain

E2E green solution
Energy saving in RAN
and data centers

Green ICT Infrastructure

15 typical verticals
100+ innovative 5G application scenarios

Green Empowerment

Green Empowerment: ZTE Digital Nebula

Steel, Metallurgy, Chemical, Cement, Urban rail, Port, Railway, Electricity, Mining, Education, Medical ...

Top Level Design on Digitalization

Business

Smart green park | Digital workplace | Digital production | Digital operation | Dgital R&D

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Studio

InOne

Enabler

Market

Integrated Operation and Maintenance Solution

Internet and data security

Precise cloud & network

Cloud Network Co-Cabinet | NodeEngine | 5G chip | Electricity CPE | Vedio AI gateway | 5G industry gateway | 5G TAU | Edge computing gateway

Analysis on vertical sectors

Challenges faced by verticals

Technical barrier

- High complexity and diversity of digital technologies requires more human and financial resources.

Inherit and reuse difficulties

- Huge amount of applications deployed in informatization stage are left unused, which is a waste of investment and will affect existing business.
- New applications can not match with the original frameworks.

Connectivity difficulties

- The original data is scattered in various isolated systems, with unclear ownership and inconsistent standards, making it difficult to utilize.

Four function of digitalization

Enabler	Modular design of digital technologies, lower the technical barrier.
Studio	Merging business and digital development, solving the developing efficiency, and lower the technocal barrier.
Market	Build up digital market, enabling trade between digital technologies, solving the inherit and reuse difficulties.
InOne	Grouping all infomations together, eliminating information gap, enhancing connectivity.

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Enabler: Full-stack ICT technology enables industry transformation

Difficulties

- AI, Big data, Cloud XR technologies are widely used in industrial operation and manufacture.However most enterprises and their application developers do not have the abilities to fully cover all new technologies, which makes digitalization limited by technical capabilities.

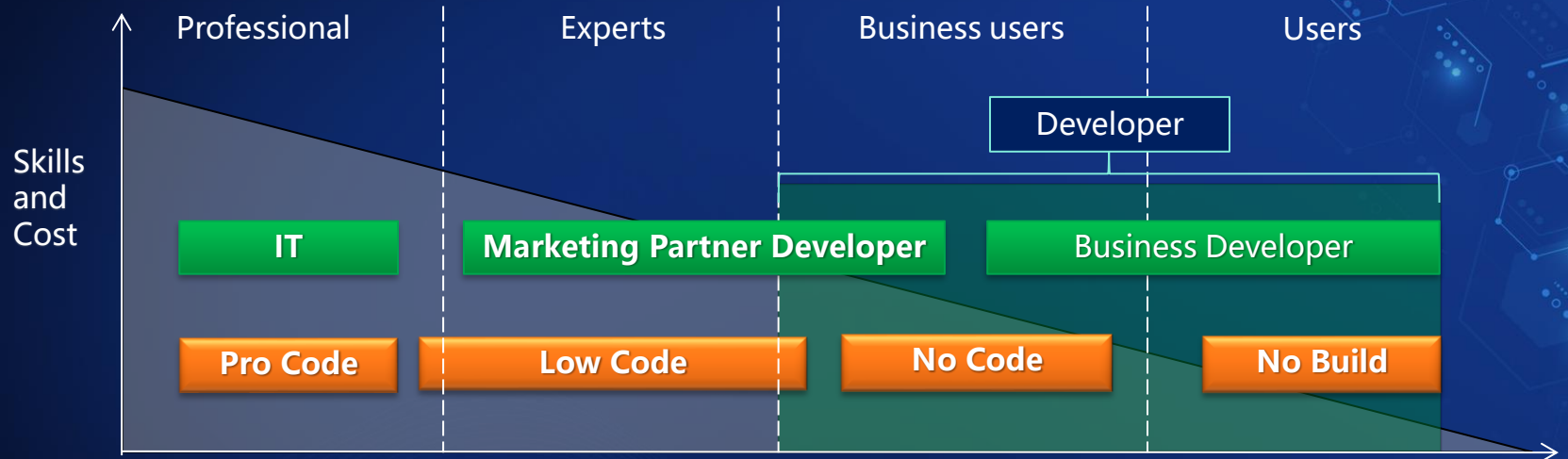
Module	Detailed Explanation
Video Cloud	Provide a full set of capabilities for video stream access, forwarding, processing and storage, lower the barrier for video applications.
Big data	Provide a high quality, high security and massive storage big data platform.
Data engine	Realize data governance and form data assets.
AI	Provide a cross-hardware platform inference engine that orchestrates AI services and implements cloud-edge collaboration.
GIS engine	Provide modular and microservice-based GIS engine.
Cloud XR	Provide the core capabilities of the metaverse: 3D reconstruction, spatial recognition, point cloud orchestration, relocation, and cloud rendering.
3D rendering engine	Realize the mapping of digital space and physical space.
GoldenDB	Provide a stable and reliable financial distributed database.
Unified communication	Provide basic capabilities such as voice, video, cluster, and Internet access.
Blockchain	A blockchain platform that supports high-performance consensus algorithms and privacy computing

Studio：Lower the development complexity

- Digital transformation requires a quick response for customized business applications, which is relying on professional coding experts.

Difficulties

- Data governance and labelize are closely related to business, which requires in-depth participant of business personnel.

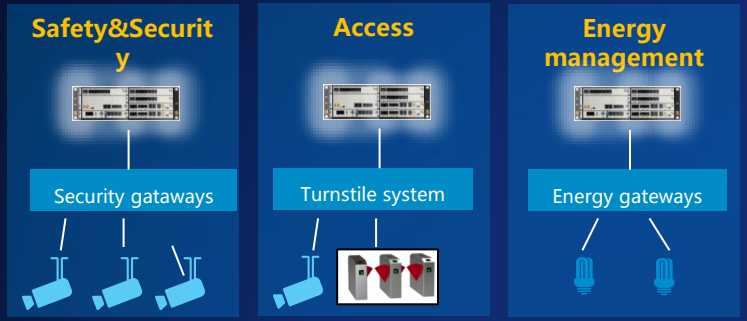


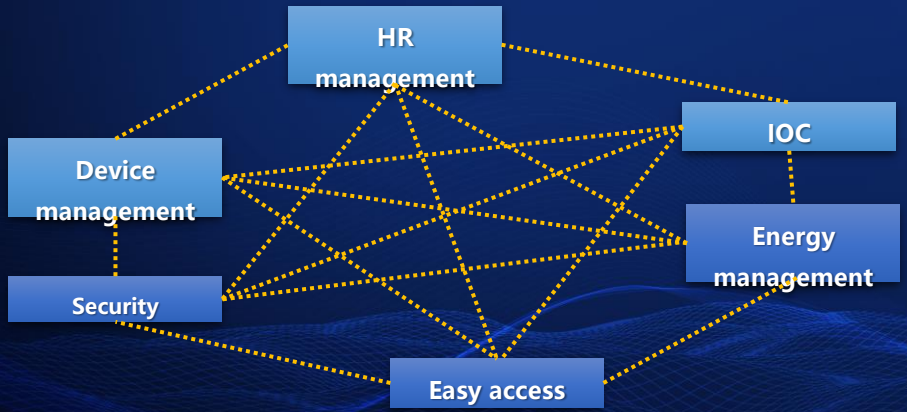
- Providing Low Code or No Code. Realizing the simple interface and editing workflow for business user.
- Providing a graphical interface to realize the visualization of the whole process of data collection, management, storage and use.

- Providing a full set of AI development tools for model training and development.
- Providing a one-stop DevOps platform for developers and providing end-to-end support for software development process.
- Providing an integrating development solution realizes continuous software iteration with rapid launch.

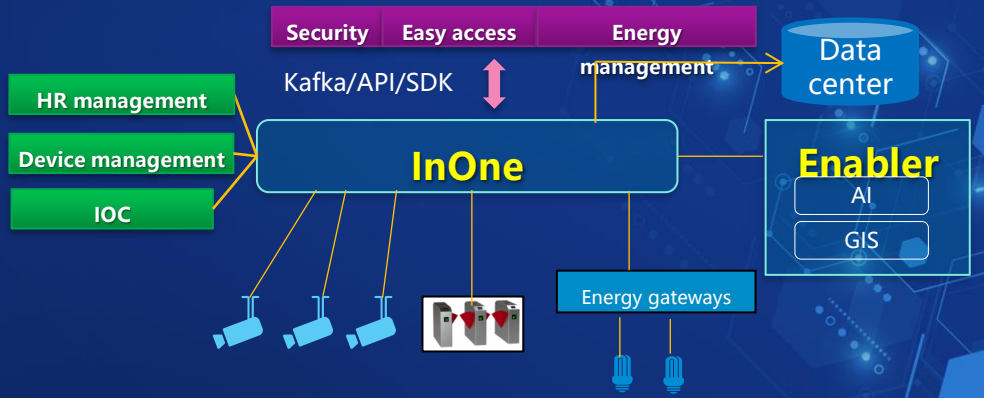
InOne: Improving efficiency and connectivity

Traditional mode





After InOne applied



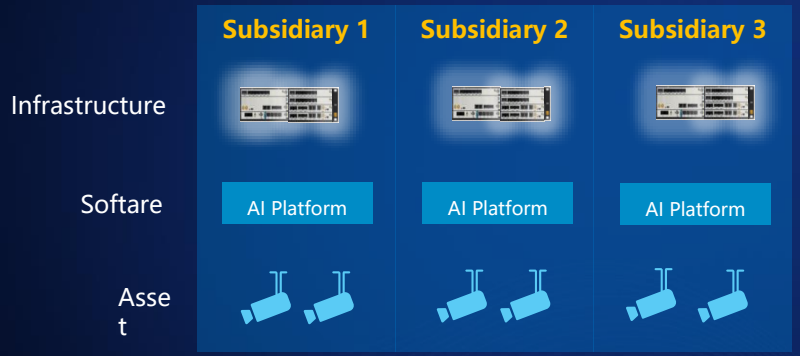
Market: A unified digital asset sharing platform

- **Storage**: Many assets are stored in personal computers or even brains
- **Sharing**: Users don't know if such an asset exists or where to look for it

Difficulties

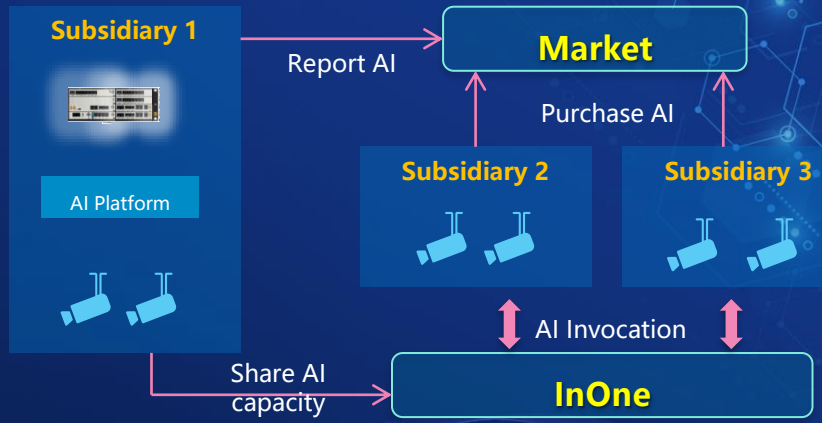
- **Management**: There is no unified standard and control over the scope of use.
- **Connection**: Data assets of different systems are separated from each other, and limited by the organizational structure.

Traditional mode



- The AI platforms are repeatedly built in different subsidiaries/companies.

After InOne applied

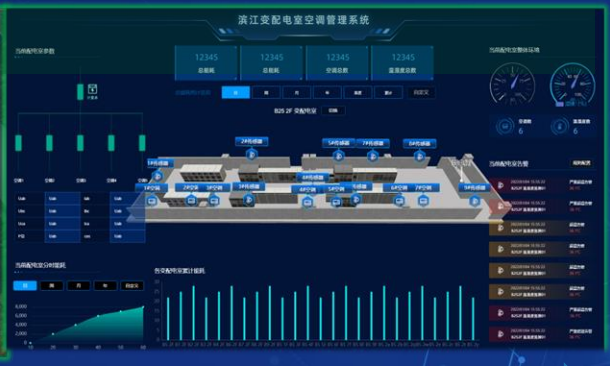


- After the first subsidiary builds the AI platform, the capabilities will be reported to the Market, then other subsidiaries can reuse the resources to save investment.

Maximize the connectivity between relevant enterprises in a convenient and controllable way.

Examples on Green Empowerment

Binjiang Factory——A Green Benchmark of intelligent manufacturing



Build up a whole picture of energy control, CFP monitoring and CFP management

Green energy generation

PV power generation

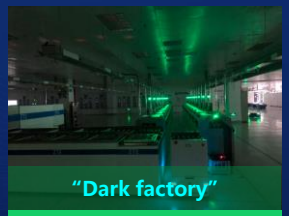
- Green energy production: 21.68MW, reducing carbon emission by 13K tons.

Energy storage

SmartLi Battery

- Smart control: Saving 1.7MkWh annually.

Energy consumption



"Dark factory"

- By the dark factory mode, reducing manufacturing energy by 8% per year.

Precise control of AC

- By the precise control of AC, saving electricity for about 10%-12%.

Liquid cooling

- Saving 80W electricity per server.
- Database PUE < 1.15.

Energy trading carbon management

Carbon management and trading system

- Participate in green energy trading, 100k kWh per year.
- Reducing operation emission by 8693.51 tons in 2023

Qingtongxia Aluminum Factory: Energy Management Platform

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Introduction

Qingtongxia aluminum factory has separately meters in the use of water, electricity and gas. However those meters are scattered in different areas and do not have upload function. The meters counting relied on labour force.

Result

1、Centralized production control：Realized real-time data aggregation through AI. Without replacing the original instruments.
2、Saving： Smart meters save 70% of labour force on reading and improve the reading accuracy to over 90%.
3、Efficiency： Based on centralized production control improve the anode roasting production for 15%. Implement automatic and intelligent management system, improve the scheduling and control efficiency by 30%.

Save labor

Smart meters save 70% of labour force on reading

Accuracy reading

By using machine vision, 485 interface and Modbus interface, improve the reading accuracy to over 90%.

Real-time reading

Connection between meter terminals and system to realize real-time reading, to improve the timeliness of the data.

Customize reports

Based on the collected data, generate energy consumption report.

Abnormal alarming

Based on the analysis of energy consumption data, abnormal alarm will help the owner to improve th energy efficiency.

Management

Using digital technology to control energy consumption in real time, adjusting energy consumption strategies in anytime.

Qingdao Metro: Urban Rail Cloud Platform

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Before empowerment

1、Low compatibility：Equipments come from different manufactures hard to coordinate with others.
2、Weak security: Lack of unified security controllable policies.
3、Poor energy efficiency：Huge amount of cloud makes it difficult reduce energy consumption.
4、Low reliability：No disaster tolerant design.

Result

- Cloud platform that is supporting by CPU core sleep technology and dynamic power management can save server energy consumption more than 30%.
- Energy management system can give a whole picture of the energy consumption to the staff, allowing them to shut down the non-essential consumption, which helps station to save more than 5% of energy.
- Intelligent lightning will control the light according to the time and surrounding environment, which save more than 50% of energy comparing with tradition mode.

Energy saving function in application level

Energy management

Intelligent lightning

Cloud Platform

Data Development Governance Engine

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Data Intelligence Discover Engine

Data collection | Data storage | Data computing | Open data

Virtualization | storage | SDN | Disater tolerant | Backup | Security

Energy saving technology in platform level

CPU

CPU core sleep

Dynamic power management

To Enable Connectivity and Trust Everywhere