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Alliance of Industrial Internet

Intelligent manufacturing practice of COSMOPlat cloud platform

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COSMOPlat cloud platform

COSMOPlat is the first industrial Internet platform with Chinese independent intellectual property rights in the world, and also is to introduce users' whole process participation experience
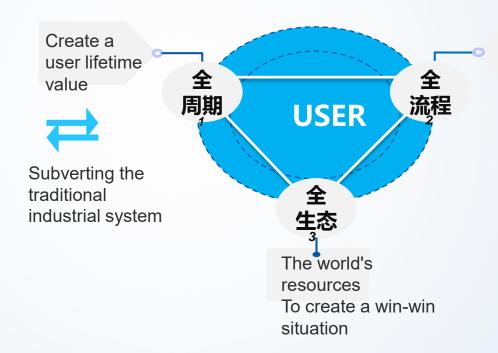
Three major features of the COSMOPlat platform
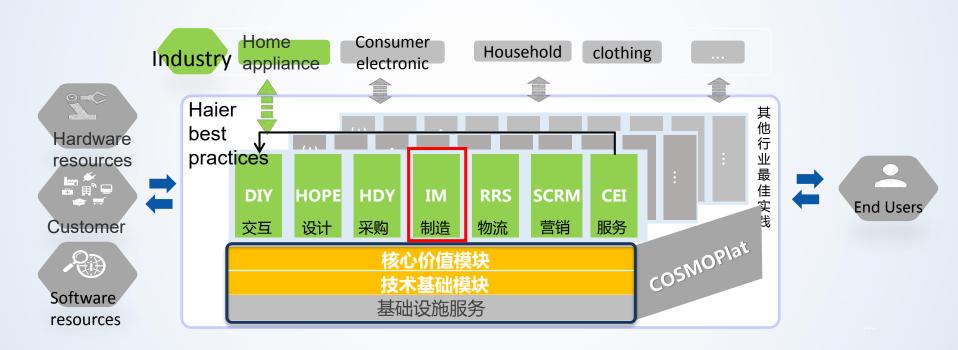
COSMOPlat

Mass customization model

Create a user lifetime value

Subverting the traditional industrial system

全周期 1

USER

全流程 2

全生态 3

Seven node Zero distance establish connectivity

The world's resources
To create a win-win situation

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COSMOPlat cloud platform

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COSMOPlat platform - enabling global enterprise transformation and upgrading
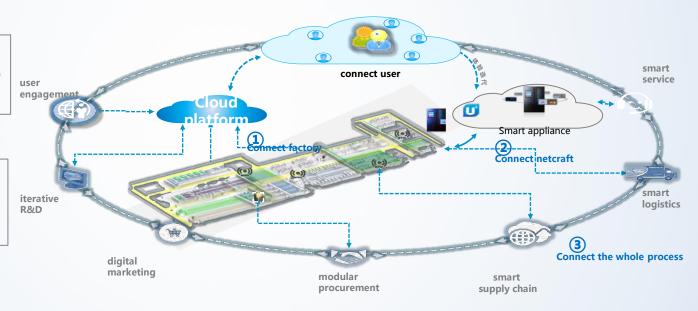
Interconnected Factory

- 3 external interconnections
  - Factory interact User
  - Factory interact Smart appliance
  - Factory interact Resources

+

- 3 internal interconnections
  - machine interact machine
  - machine interact material
  - human interact machine

Technology Innovation

Leading IT Technology

Cloud+Edge Deployment
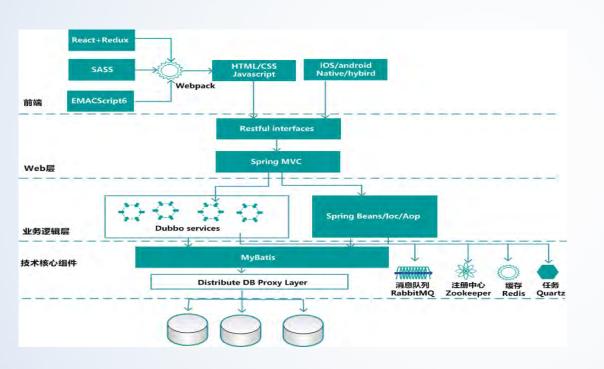
Modular Configuration

IOT

Microservices Architecture
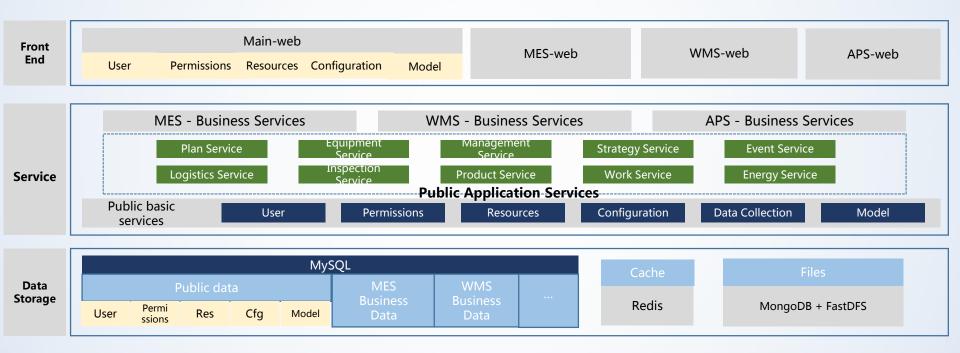
- ✓ Front end development
  React+Redux
  webpack
  EMACScript6
  SASS

- ◆ Back end development：
  - ✓ Spring Boot
  - ✓ Spring MVC
  - ✓ Spring framework（IoC，AOP）
  - ✓ Dubbo
  - ✓ MyBatis

- ◆ 技术组件（推荐）：
  - ✓ Redis
  - ✓ RabbitMQ
  - ✓ Zookeeper
  - ✓ MongoDB

One Architecture One Platform

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Front End	Main-web					MES-web	WMS-web	APS-web
	User	Permissions	Resources	Configuration	Model			

Service

|	MES - Business Services	WMS - Business Services	APS - Business Services
	Plan Service	Equipment Service	Management Service	Strategy Service	Event Service
	Logistics Service	Inspection Service	Product Service	Work Service	Energy Service

Public Application Services

Public basic services	User	Permissions	Resources	Configuration	Data Collection	Model

Data Storage

MySQL					Cache	Files
Public data				MES Business Data	WMS Business Data	...
User	Permissions	Res	Cfg	Model	Redis	MongoDB + FastDFS

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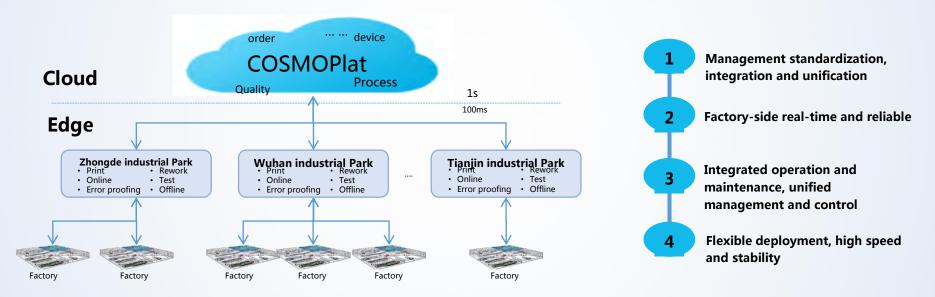
Cloud+Edge

Cloud+Edge mode not only meet the factory's real-time data requirements, but also to achieve unified management of the group

1   **Management standardization, integration and unification**

2   **Factory-side real-time and reliable**

3   **Integrated operation and maintenance, unified management and control**

4   **Flexible deployment, high speed and stability**
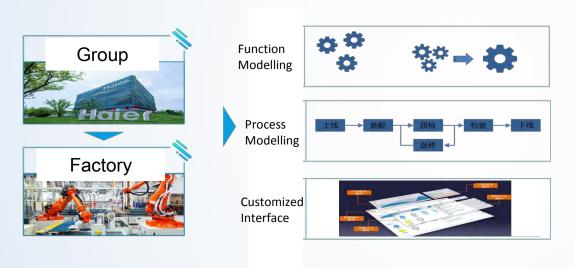
> **System more flexible, reduce project cycle, and reduce development and implementation costs.**

Group

Factory

Function Modelling

Process Modelling

上线 → 装配 → 质检 → 包装 → 下线
　　　　　　　　　↓
　　　　　　　　返修

Customized Interface

1 Flexible Function

2 Flexible Process

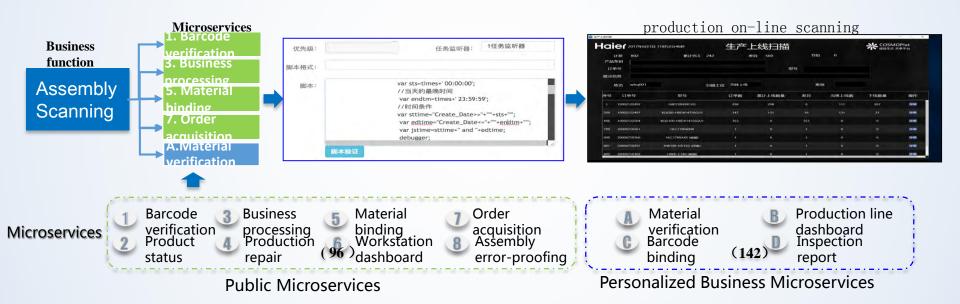**3** Support group, Multi-plant management

4 Business needs quickly achieved

Function Modelling

> **Combination of public microservices and personalized microservices can produce more than 300 business functions**

Business function

Assembly Scanning

Microservices

1. Barcode verification
3. Business processing
5. Material binding
7. Order acquisition
A. Material verification

production on-line scanning

Microservices

Public Microservices

1	Barcode verification Product status	3	Business processing Production repair	5	Material binding Workstation dashboard	7	Order acquisition Assembly error-proofing
2		4		6 （96）		8	

Personalized Business Microservices

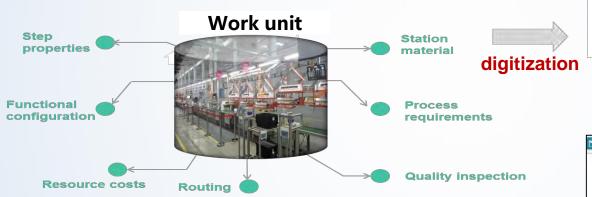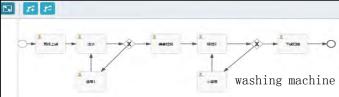| A	Material verification Barcode binding	B	Production line dashboard Inspection report
C	（142）	D	

Process Modelling

- ➢ **Through digital management, binding the work unit with quality, technology and other production factors**
- ➢ **Through the process engine, organize the work unit to meet the business requirements of the production line**

Work unit

Step properties

Functional configuration

Resource costs

Routing

Station material

Process requirements

Quality inspection

digitization

configuration

washing machine

Customized Interface

> **UI and the backstage function is loose coupling**
> **Easy to config the interface**

Loosely coupled design of
operation interface and backstage function

Management Interface
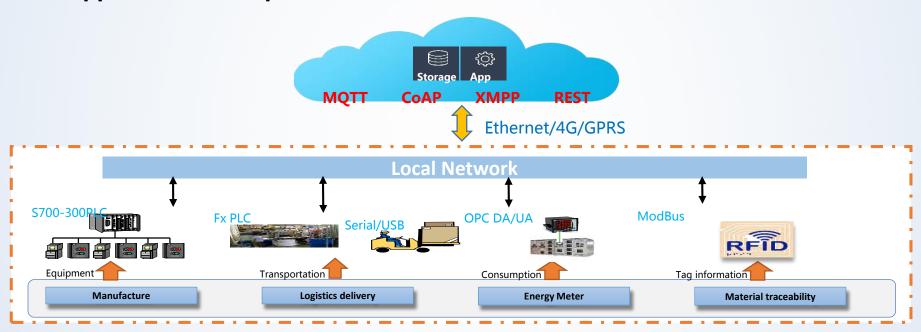

Statistics Interface

Equipment Connected

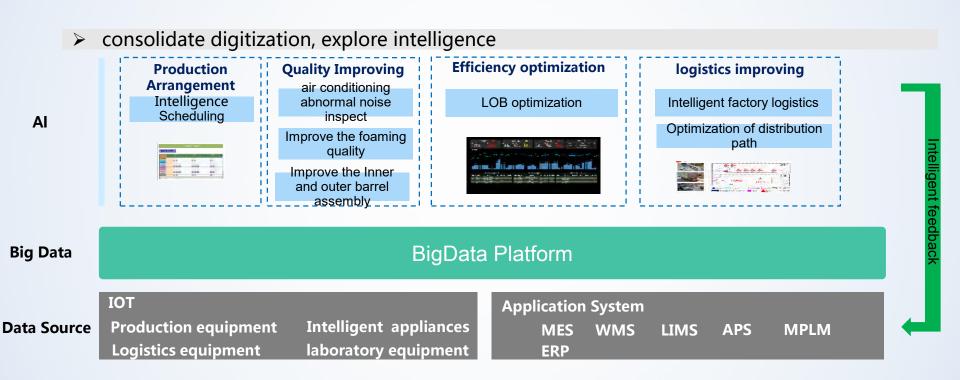- Support 97 equipment protocols
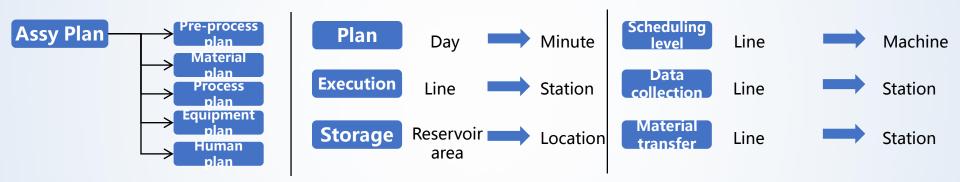- Support 6 network protocols

Business Innovations

AI

Lean Manufacturing
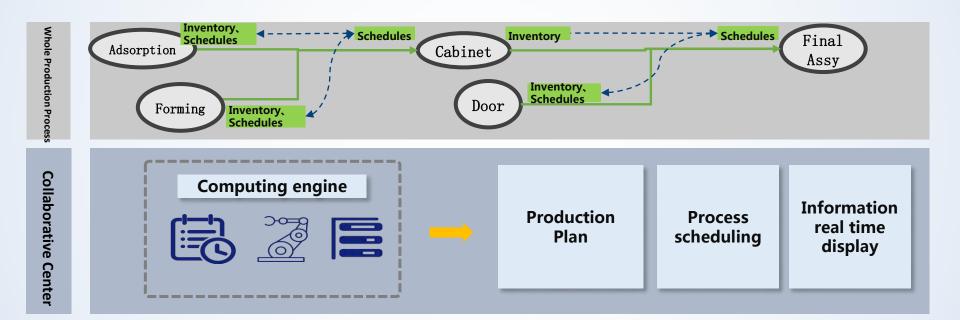
Collaborative Production

Event Driven

Transparent Visualization

AI

➤ consolidate digitization, explore intelligence

AI

Production Arrangement

Intelligence Scheduling

Quality Improving

air conditioning abnormal noise inspect

Improve the foaming quality

Improve the Inner and outer barrel assembly

Efficiency optimization

LOB optimization

logistics improving

Intelligent factory logistics

Optimization of distribution path

Intelligent feedback

Big Data

BigData Platform

Data Source

IOT
Production equipment   Intelligent appliances
Logistics equipment   laboratory equipment

Application System
MES   WMS   LIMS   APS   MPLM
ERP

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Lean Manufacturing

- **From coarse to fine**

Assy Plan →
- Pre-process plan
- Material plan
- Process plan
- Equipment plan
- Human plan

Plan	Day	→	Minute
Execution	Line	→	Station
Storage	Reservoir area	→	Location

Scheduling level	Line	→	Machine
Data collection	Line	→	Station
Material transfer	Line	→	Station

Collaborative Production

Event Driven

Reach person in real time

Event engine

Real-time notification

Trigger

Closed off the difference

Real-time Data

- Quality
- Production execution
- Andon
- Equipment
- Process Parameters
- Material inventory

Real-time display

Audible alarm

Real-time reminder

Visualization Implementation

Big screen	Station dashboard	Mobile APP	iHaier	SMS/e-mail
…	…	…	…	…

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World ECONOMIC FORUM 2018

How do we build an ethical framework for the Fourth Industrial Revolution?

1
Haier: the only Chinese company selected

9
Companies nominated

1000+
Companies participated