



CHAIRMAN'S MESSAGE

**"One centimeter wide,
one kilometer deep."**

Jonathan Hua

Founder & Chairman, HWArobotics

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One platform since 2007

Since 2007 we have been obsessed with one engineering problem: getting goods in and out of storage faster, denser and more reliably. Every answer made our engineering sharper, and every sharper answer opened a new question. The shuttle is where we began. It was never where we stopped.

2007

The first shuttle ships

The first ASRS shuttle system in China, into a working warehouse. Everything since has been the same platform, refined against real duty.

2013

Publishing, at national scale

A partnership with China's largest publishing and media group, a global top-ten publisher. We have led the book sector ever since.

2017

The first end-to-end dark warehouse

The world's first fully unmanned end-to-end warehouse, built for a major e-commerce operator.

2019

First move overseas

A leading European sportswear brand took the platform abroad for the first time, and the international business began there.

2024

Number one in China

Leading provider of shuttle ASRS in the domestic market, running at scale for the largest platforms operating there.

2026

Global integrators and platforms

Strategic partnerships with several of the world's top-ten integrators, and a place on the supplier list of several leading global e-commerce companies.

Where we operate



2007

The delivery of China's first shuttle-type automated storage and retrieval system project

8

Generations of shuttles

15+

Global service locations

5

Global spare-parts centers

24/7

Global technical service

Think inside the rack

Against order volatility, the cost of land and the demand for continuous operation, shuttle ASRS answers on four fronts: throughput, flexibility, storage density and reliability.

01 | High throughput

Vehicles in parallel, past the single-machine ceiling

Multi-level, multi-vehicle coordination with dynamic task scheduling gives high-concurrency storage and retrieval. Add equipment as needed and system throughput keeps rising.

02 | High flexibility

Configured to demand, scaled with the business

Shuttles, lifts and workstations are modular. Add or remove them as volume dictates, to keep pace with changes in SKUs, orders and business scale.

03 | High storage density

Fewer aisles, more usable capacity

Full use of the vertical space, with dense locations and multi-deep storage compressing aisles and non-storage areas to raise capacity per square meter.

04 | High reliability

One machine down, the system keeps running

Distributed multi-vehicle operation reallocates tasks when a single vehicle faults, limiting the effect of a local failure on continuous running.

Deep experience. Full range. Dependable quality.

01 | Long track record

- 20+ years in the field
- Eight generations of product
- Two decades of projects behind the engineering
- A closer read on what each sector needs

02 | Complete range

- Fixed and variable-size totes, cartons and pallets
- Single-deep through four-deep storage
- Bidirectional and four-way travel
- Ambient, chilled and sub-zero environments

03 | Reliable in service

- MMBF guaranteed at 5,000 cycles
- 99.99% picking accuracy
- 99.98% system availability
- Rack heights to 40 m



PRODUCT DETAIL

Exacting craft, quality by design

Every part worked to a fine tolerance.

SOLUTIONS

Tote-to-person solution

High throughput | High density | High flexibility | Easy to scale

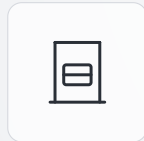
A shuttle ASRS at the core, lifts moving totes and vehicles between levels, and conveyor or AMR beyond the rack. Shuttles pull from dense storage lanes, lifts carry the work up and down the face, and the transport layer delivers the right tote to the right workstation. Every model shares one rail wheelbase, so the fleet mix can change with the business without touching the steel.



Tote Shuttle



Shuttle Lift



Goods Lift



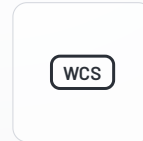
Conveyor



AMR



Racking



WCS

A High-throughput configuration **Shuttles + lifts + conveyors**

Customers **SHEIN · Freshippo**

2,800

Totes per hour
per aisle

+80%

Throughput

-70%

Labor
cost

B High-storage-density configuration **Four-deep lanes + variable-size shuttles**

Customers **JOMA (Spain) · Dongfeng Motor**

3-4×

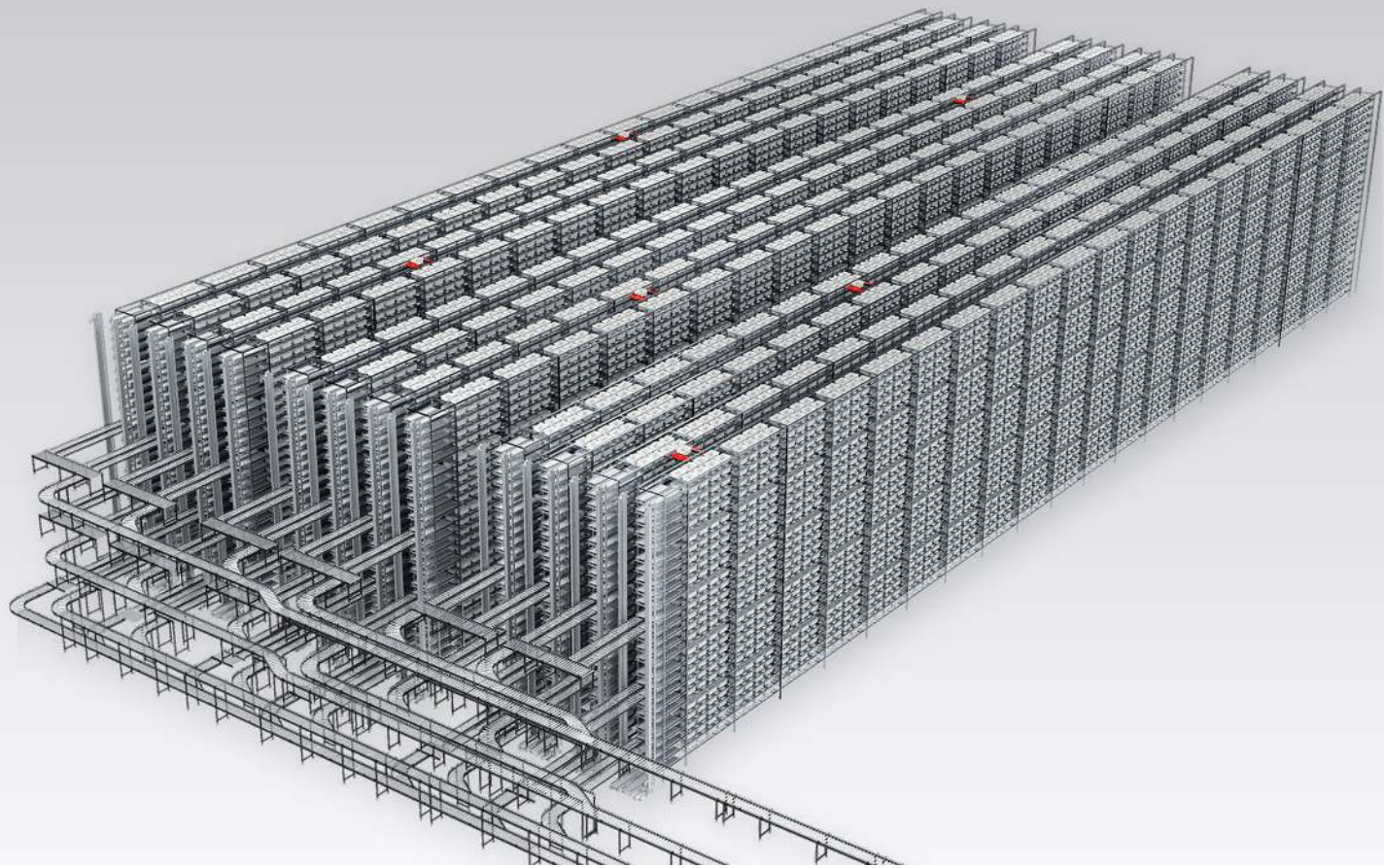
Space
utilization

-50%

Operating
cost

4-deep

Storage
lanes



Buffering and sorting solution

High-density consolidation | Dynamic mixed storage | Precise sortation | Flexible expansion

Consolidation buffer shuttles running flow-rack lanes, with lifts at the face and conveyor beyond. Orders are gathered across lanes, held in sequence while the rest of the order catches up, and released in the order the dock needs them. Mixed storage and dynamic sequencing in the same structure, on the same rails as every other model.



Buffer Shuttle



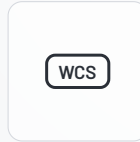
Goods Lift



Conveyor



Flow Rack



WCS

Consolidation and buffering configuration **Buffer shuttles + lifts + flow racks**

Customers **Gaoji · Yifeng**

+100%

Storage
density

+100%

Order
processing

-70%

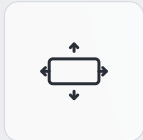
Manual
work



Pallet-to-person solution

High-density storage | Efficient picking | Flexible scheduling

Dense pallet racking worked by four-way shuttles on every level, with lifts at the face and conveyor or AMR beyond. Whole pallets move from receiving to storage to dispatch without a truck entering the aisle, and the same fleet serves ambient, chilled and sub-zero stores.



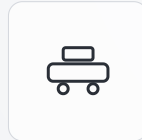
Pallet Shuttle



Pallet Lift



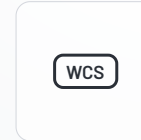
Conveyor



AMR



Racking



WCS

Four-way pallet configuration **Four-way pallet shuttles + lifts + conveyors / AMRs**

Customers **FORVIA · Anhui Wanxin**

+200%

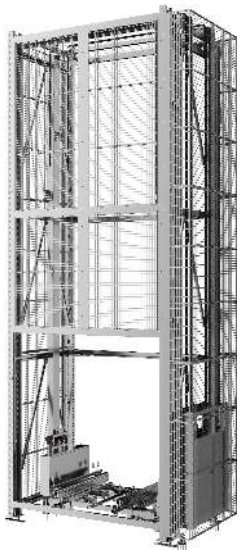
Space
utilization

+70%

Throughput

-50%

Labor
cost



Tote-to-robot solution

Unmanned picking | Efficient coordination | Precise operation | Flexible expansion

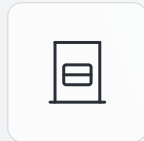
The same shuttle ASRS, with robotic arms in place of operators at the pick face. Conveyor brings the tote to the cell, vision identifies the item, and the arm transfers it to the order carton without a person in the loop. Stations run through the night shift, and the line can be built with people first and robots added cell by cell.



Tote Shuttle



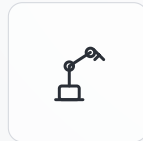
Shuttle Lift



Goods Lift



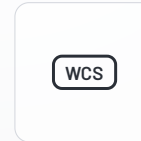
Conveyor



Robotic Arm



Racking



WCS

Robotic picking configuration **Shuttles + lifts + conveyors + robot cells**

Customer **Fully unmanned e-commerce warehouse**

+100%

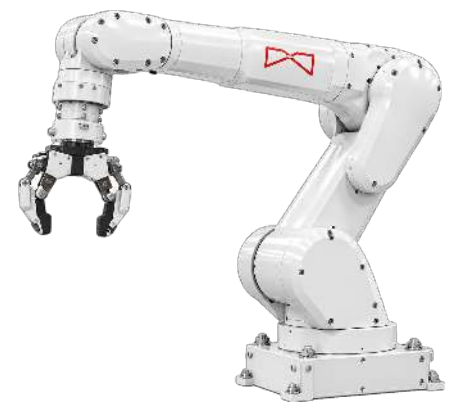
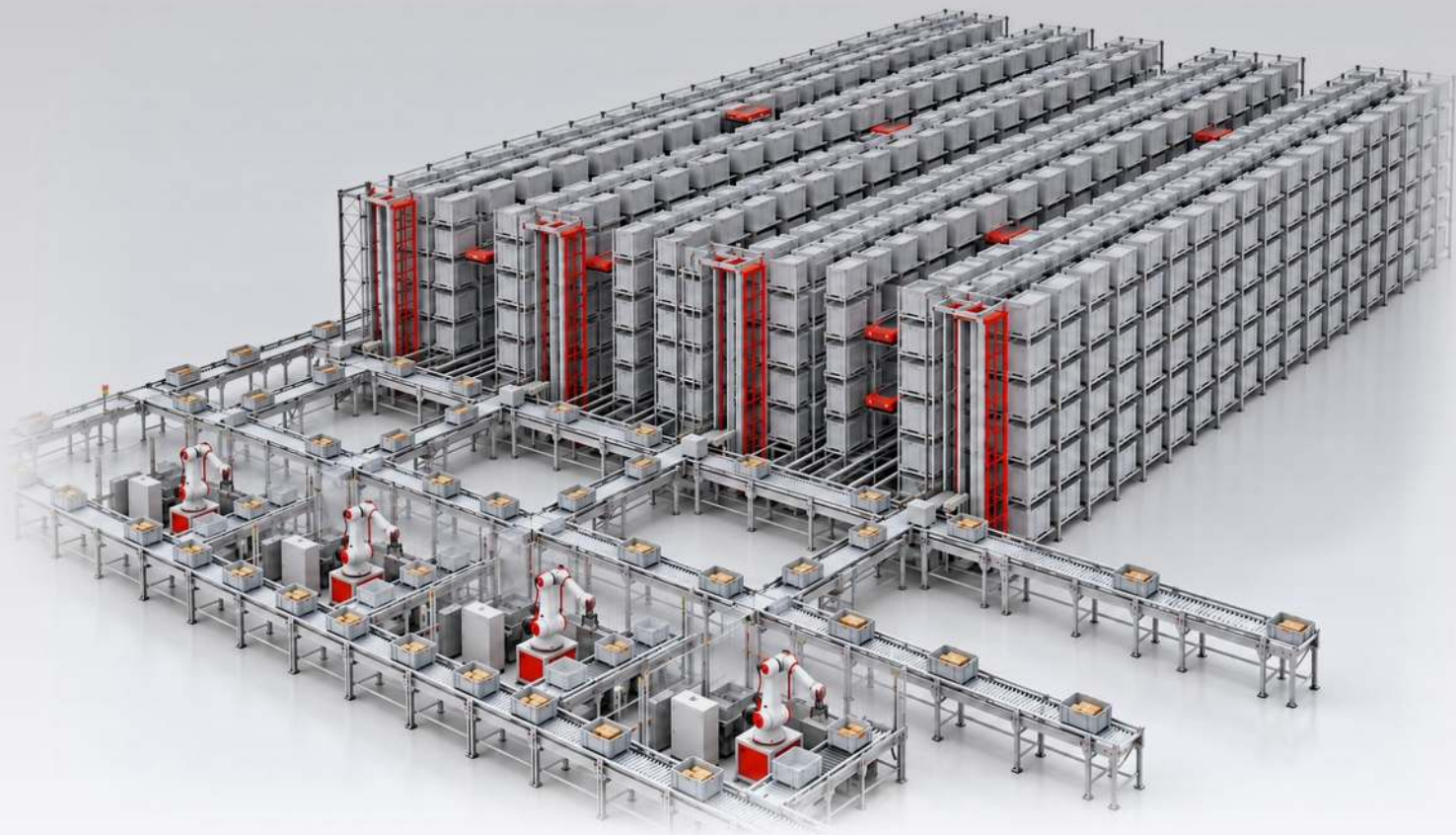
Picking
efficiency

99.99%

Picking
accuracy

-90%

Labor
requirement



Core Product Capabilities

Each machine sees the aisle clearly and places loads accurately on its own, then works as part of a fleet under the unified command of the scheduling system.

01 Full-Range Sensing

LiDAR fused with multiple sensors perceives complex warehouse environments in real time – a first among tote shuttles.

- Dynamic obstacle avoidance
- Vision detects and auto-corrects load offset
- Stable operation around the clock



02 Dynamic Slot Management

No more fixed “one item, one slot”: locations are assigned in real time by inventory status and inbound/outbound frequency.

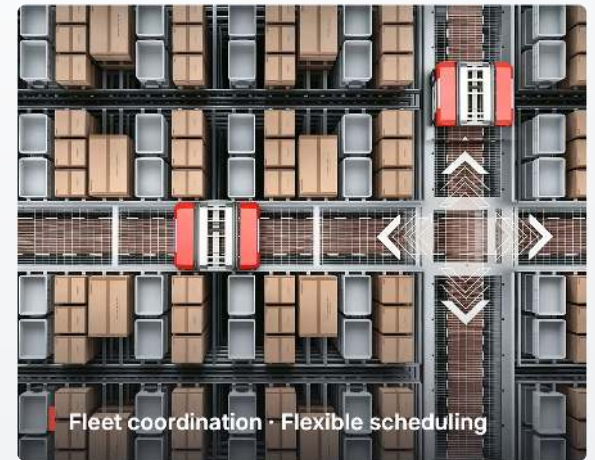
- Real-time allocation, fully traceable
- Relocation and transfer on demand
- Maximum use of storage space



03 Intelligent Fleet Scheduling

Bidirectional and four-way shuttles work as one fleet in the same aisle, with the vehicle mix adjusted flexibly as business fluctuates.

- Mixed fleets in a single aisle
- Four-way shuttles switch to bidirectional at peak



Tote Shuttles



01 Standard-Size Tote Shuttle

Bidirectional, for 600 × 400 mm totes and cartons.

Rated load	35 kg	Max load	50 kg
Capacity	170 totes/h	Speed	6 m/s
Acceleration	2 m/s ²	Travel mode	Bidirectional
Depth	1 to 4 deep	Load type	Totes and cartons
Power	Conductor rail or battery		
Goods size	600 × 400 mm, customizable		

One rack. Every shuttle.

All models share the same wheelbase on the rack rails, so they run side by side in the same racking. These two carry totes and cartons on bidirectional duty.



02 Variable-Size Tote Shuttle

Adaptive fork handles mixed tote sizes in one rack.

Rated load	35 kg	Max load	50 kg
Capacity	170 totes/h	Speed	6 m/s
Acceleration	2 m/s ²	Travel mode	Bidirectional
Depth	1 to 4 deep	Handling	Adaptive fork
Power	Conductor rail or battery		
Goods size	200-850 × 200-850 × 60-850 mm		

Tote Shuttles



03 Four-Way Tote Shuttle

Changes aisle on its own; switches to bidirectional duty at peak.

Rated load	35 kg	Max load	50 kg
Capacity	170 totes/h	Speed	6 m/s
Cross travel	4 m/s	Travel mode	Four-way
Depth	1 to 4 deep	Load type	Totes and cartons
Power	Lithium-titanate battery		
Goods size	200-850 × 200-850 × 60-850 mm		

One rack. Every shuttle.

The same wheelbase again, so these run in the same racking as the models opposite – adding aisle changing and dynamic sequencing.



04 Buffer & Sortation Shuttle

Belt-and-roller drive for dynamic sequencing and parallel store-and-pick.

Rated load	20 kg	Max load	30 kg
Capacity	160 totes/h	Speed	6 m/s
Acceleration	2 m/s ²	Drive	Belt and roller
Function	Sequencing	Operation	Store-and-pick
Power	Conductor rail		
Goods size	200-600 × 200-400 × 150-500 mm		

Tote system lifts

Tote Lift

Moves totes between interface conveyors and buffer stations.

- **Servo drive** — stable, precise high-frequency operation
- **Herringbone timing belt** — maintenance-free, low vibration
- **Dual-station design** — two carriages alternate to cut waiting
- **Safety protection** — multi-level warnings and safeguards

	PAYLOAD	SPEED · ACCEL.	THROUGHPUT
Standard	50 kg	3 m/s · 1.5 m/s ²	200 totes/h
Enhanced	100 kg	5 m/s · 7 m/s ²	650 totes/h

Shuttle Lift

For automatic shuttle entry, exit and level changes.

- **Servo drive** — stable, precise high-frequency operation
- **Conductor rail power** — millimeter positioning, continuous stable supply
- **Mechanical stopper** — hard-limit protection against shuttle overrun
- **Safety protection** — multi-level alerts, human-machine co-working

	PAYLOAD	SPEED · ACCEL.	THROUGHPUT
Standard	165 kg (loaded)	3 m/s · 1.5 m/s ²	120 cycles/h
Enhanced	165 kg (loaded)	3 m/s · 3 m/s ²	165 cycles/h



Pallet Four-Way Shuttle

An in-rack pallet shuttle for heavy-duty warehousing: a 125 mm body that carries 1.5 t, full servo travel and lifting, on-board laser obstacle detection, and RFID plus address-hole positioning, in a standard build for ambient and chilled stores and a sub-zero build for freezers down to -25°C .

Load capacity	1,500 kg
Shuttle weight	330 kg
Dimensions	1,154 × 960 × 125 mm
Pallet size	1,200 × 1,000 mm
Temperature range	-25 to 45°C
No-load speed	2 m/s
Lifting stroke / time	35 mm / 3 s



STANDARD

Ambient and chilled warehouses



SUB-ZERO

Freezer duty down to -25°C

Pallet Shuttle Lift

A dual-purpose lift for four-way pallet systems, carrying both shuttles and loads. A servo motor drives a rack-and-pinion mechanism which, together with a counterweight system, keeps the carriage running smoothly and efficiently. Automatic docking, photoelectric detection and wireless communication enable automatic load transfer and cross-level shuttle dispatching. A mechanical safety stopper keeps shuttles from accidentally leaving the rails, for safe and stable system operation.

Payload	2,000 kg
Lifting method	Rack and pinion
Positioning	Servo + photoelectric addressing
Lifting speed	0.8 m/s
Capacity per lift	60 pallets/h
Safety	Emergency deceleration Travel-limit protection Overload alarm Top and bottom over-travel protection



WCS: traffic control for the warehouse

The HWArobotics Warehouse Control System (WCS) schedules, in real time, the behavior and actions of all active objects in a warehouse or distribution center. Acting as the traffic police of internal logistics, it keeps every material handling device operating stably and efficiently, improving overall warehouse efficiency.

01

Real-time scheduling

Every material-handling device is scheduled live, task by task.

02

Dynamic storage locations

Locations are allocated dynamically and every movement stays traceable.

03

Mixed shuttle fleets

Bidirectional and four-way shuttles are scheduled as one fleet.

04

Host integration

Deep integration with WMS and MES, with tasks down and status up.

99.99%

Picking accuracy

99.98%

System availability

>1,000

Shuttles per scheduled fleet

Task pool and wave release

Orders are turned into tasks and released at the rate the floor can absorb.

Route solving and traffic control

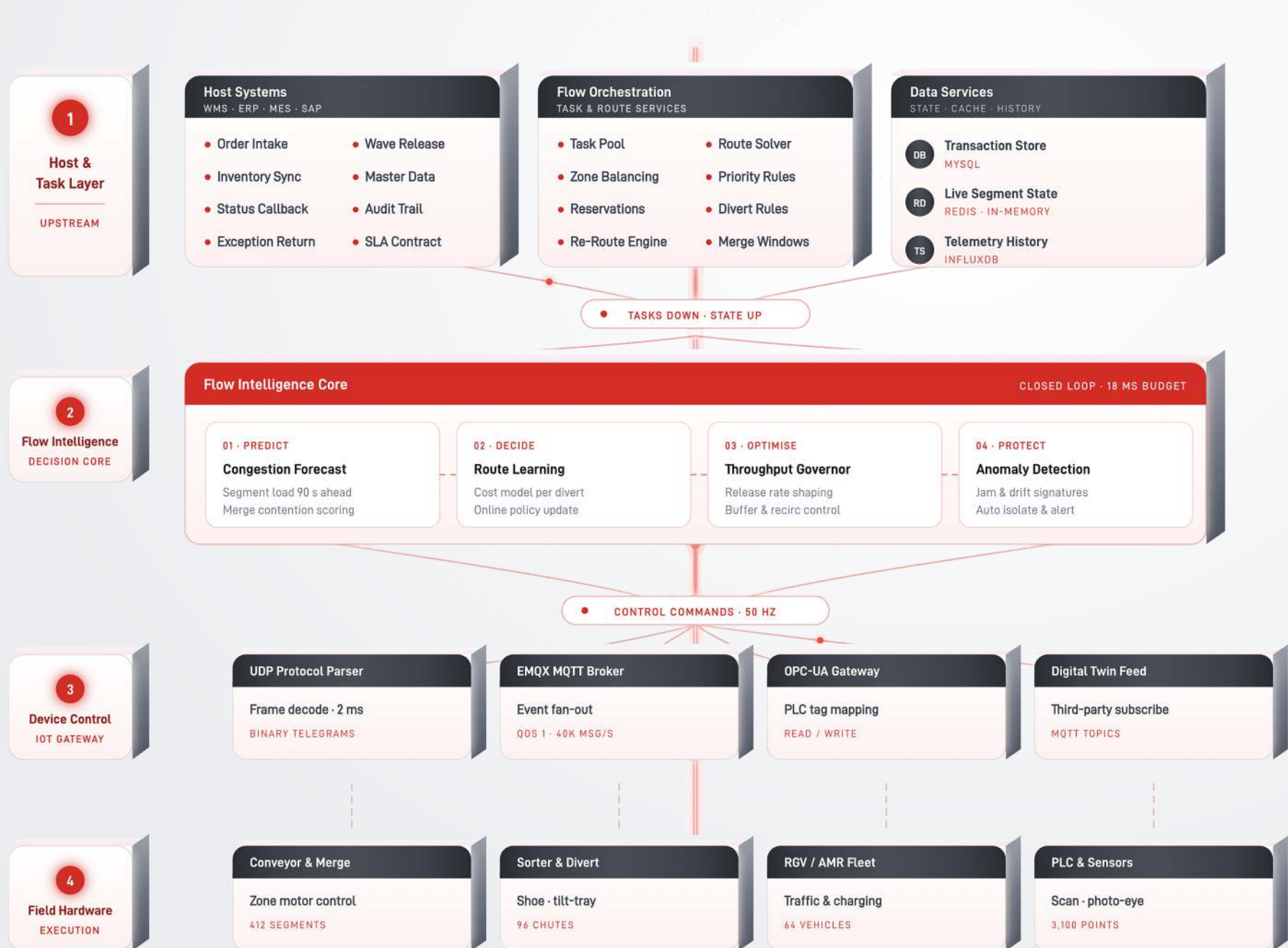
Routes, merges and priorities are resolved continuously across the fleet.

Telemetry and reporting

Every movement is logged for throughput analysis and audit.

System architecture

Four layers, one closed loop: host systems hand down tasks, the control core decides, gateways drive the devices and the field hardware reports back.



Physical safety

Every HWArobotics installation is designed so that goods stay in the rack and people stay out of the machine's way.

Anti-fall protection for goods

Metal baffles on the outer side of every storage cell stop goods sliding outward.

Safety travel photoelectric sensors keep goods inside the shuttle's safe operating area while it moves.

Tote-detection sensors identify abnormal or obstructed totes during storage and retrieval.

Sensors at the lift's front and rear module joints, plus up/down detection at floor level.

Safety door control

Electronic locks at maintenance entrances: after Request Entry, the system finishes the current task, stops safely and locks the equipment before anyone enters.

Emergency stop

Pressing the emergency stop halts equipment immediately to prevent injury.

Safety zone isolation

Enclosed fencing separates the ASRS operating area from personnel areas, preventing unauthorized entry.

Maintenance platform

A fully covered platform and walkway rated above 300 kg/m² spans the storage area, giving safe access to every operating point without work at height.

Fire safety

Metal baffles beneath the pallet supports keep sprinkler coverage precise.

Information security

Network isolation, environment isolation, access control and identity authentication. External network access and internal service calls are strictly controlled, protecting production systems, business data and equipment operation.

01

Power failure

A UPS protects task data during an outage, and the system restarts quickly once power returns.

02

Network loss

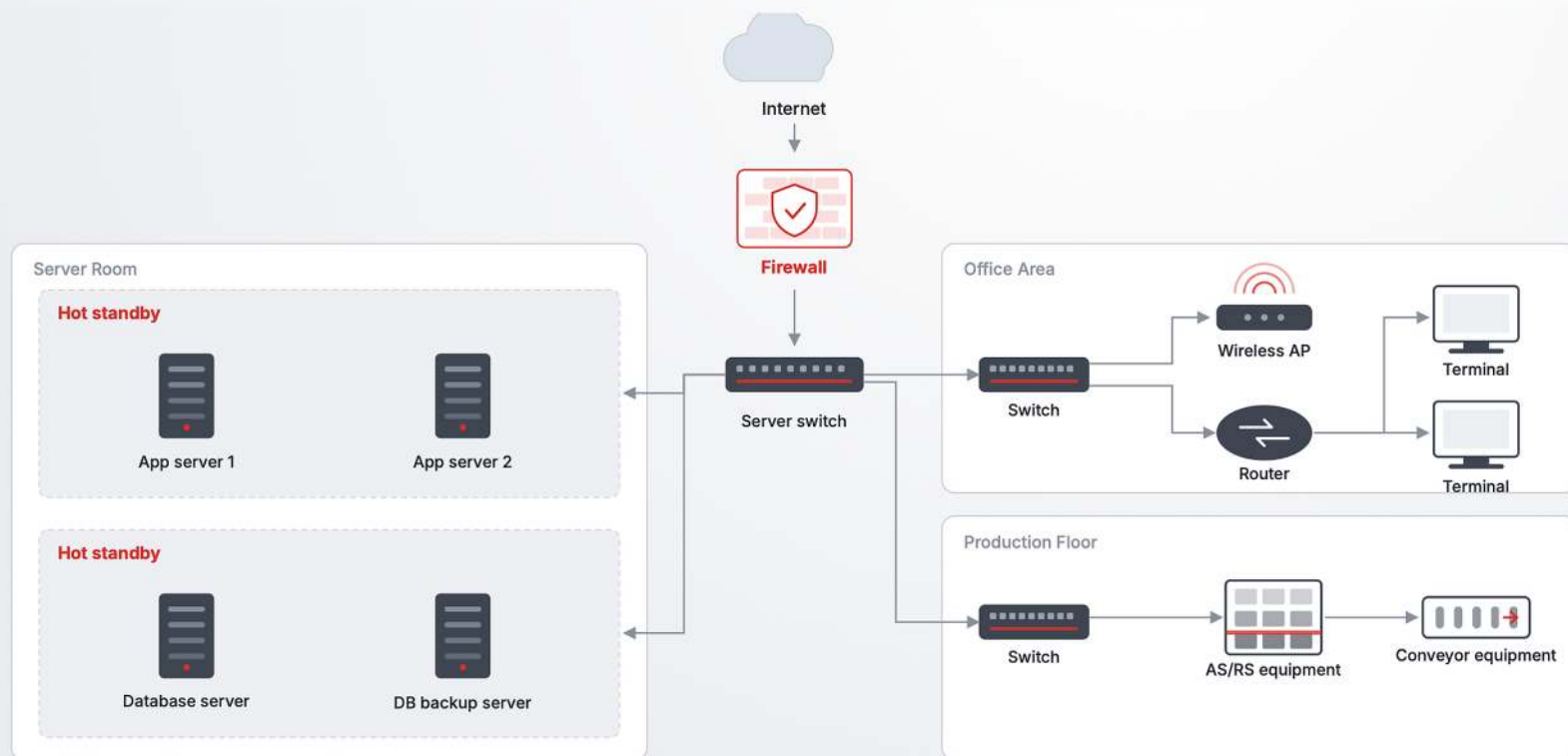
Buffered tasks run to completion, then the system enters safe standby.

03

Isolated device layer

The device layer sits on a dedicated internal network, separated from the layers above.

REFERENCE NETWORK ARCHITECTURE



Security requirements are reviewed with your IT team during design and validated before handover.

Our After-Sales Service Commitment

Fast · Economical · Steady · Smart · Secure Five commitments for the full life cycle of every machine

- 1**

Timed Fault Response
RAPID RESPONSE

 - 24/7 hotline with three-level smart response
 - **Level 1 · Urgent** (operations affected): response within 30 minutes
 - **Level 2 · Routine** (beyond on-site staff; contingency in place, site still operating): response within 1 hour
 - **Level 3 · Technical advice** (solved by phone guidance, no impact on operations): response within 2 hours
- 2**

Lifetime Care, Clear Costs
COST-EFFECTIVE

 - Priority supply from regional parts depots to cut downtime
 - Lifetime maintenance commitment and long-term service
 - Transparent post-warranty pricing, no hidden charges
- 3**

Regular Visits, Prevention
PREVENTIVE CARE

 - A lifetime digital health record for every machine
 - Proactive on-site inspections every six months under warranty
 - Problems prevented early, system stability improved
- 4**

Training & Know-How
TRAINING & SUPPORT

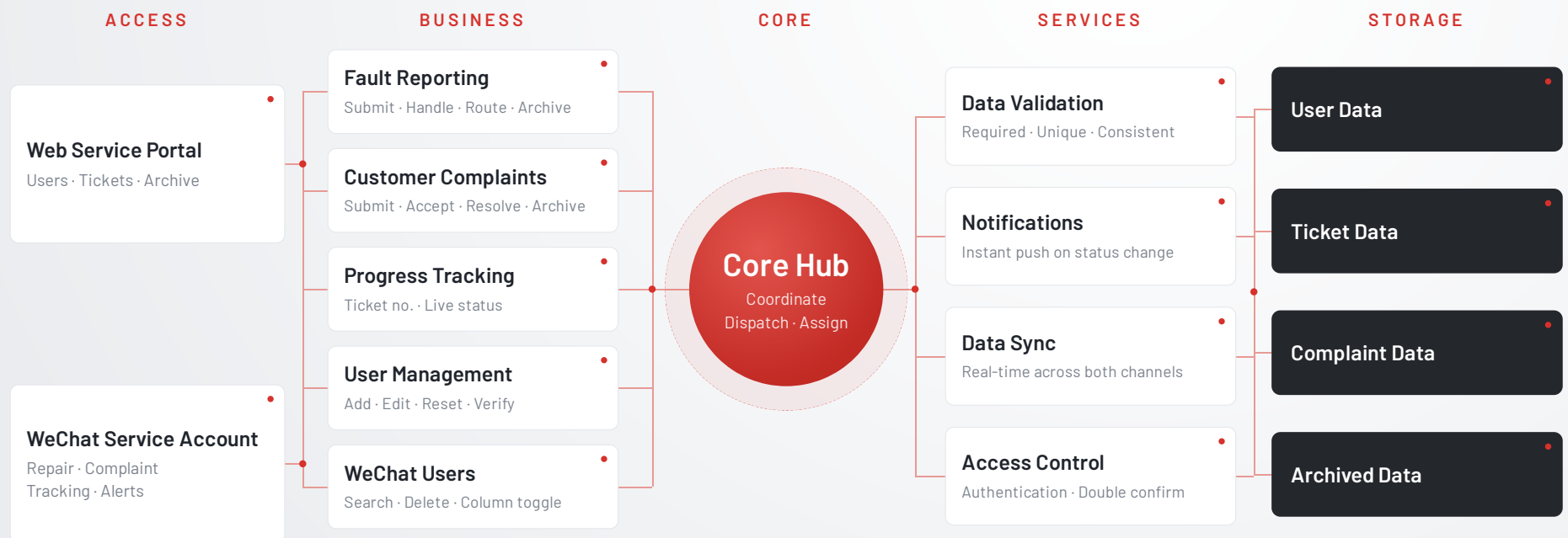
 - Tailored training: operation, maintenance, troubleshooting
 - 24/7 remote expert guidance to build your team's own O&M skills
- 5**

Clear Process, Full Trust
RELIABLE PROCESS

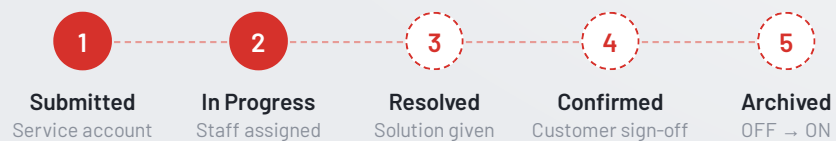
 - Standardized service process with clear fault grading
 - A dedicated service contact for fast, direct communication
 - The whole service process is traceable and open to review
 - Senior engineers + strategic spare-parts stock you can rely on

After-Sales Service Support System

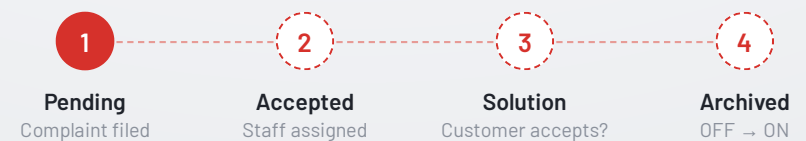
Dual-channel access, unified dispatch, end-to-end traceability



● Fault Reporting · Status Flow



● Customer Complaint · Status Flow



Systems in operation



CROSS-BORDER E-COMMERCE

High-Density Storage, Worry-Free Peaks

6 aisles and 28,809 storage locations, served by 90 standard tote shuttles and 24 tote lifts. Four of the lifts sit on the same side of the aisles and are dedicated to wave picking.

SPACE UTILIZATION	FULFILLMENT COST	SHIPPING EFFICIENCY
+300%	-50%	+100%



MANUFACTURING

Fleet Coordination, Flexible Expansion

10,000+ tote locations, served by 24 variable-size four-way tote shuttles, 4 tote lifts and 8 AMRs. Totes and cartons are stored together, with inbound and outbound running in parallel.

STORAGE DENSITY	LABOR COST	PICKING ACCURACY
+100%	-70%	99.99%



PHARMA RETAIL · YIFENG PHARMACY

Consolidation Buffer System

Three levels of flow racking with 12 consolidation buffer shuttles, 4 lifts and 246 lanes hold 3,690 totes and handle over 1,600 totes/hour. Buffering, consolidation and exception-tote returns are fully automatic.

FOOTPRINT	STAFF EFFICIENCY	CONSOLIDATION LABOR
-75%	+100%	-80%



BOOKS · ANHUI WANXIN

Integrated Tote & Pallet System

The tote ASRS has 9 aisles and 61,424 locations, with 99 standard tote shuttles and 6 buffer & sortation shuttles. The pallet ASRS has 4,068 locations, with 18 four-way pallet shuttles and 4 pallet lifts.

FOOTPRINT	DAILY OUTBOUND	PIECE PICKING
-30 to -50%	100,000 pcs	80,000 totes/day

CLIENTS

Trusted by







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