CHALLENGE :
MAKING WAREHOUSES SMART
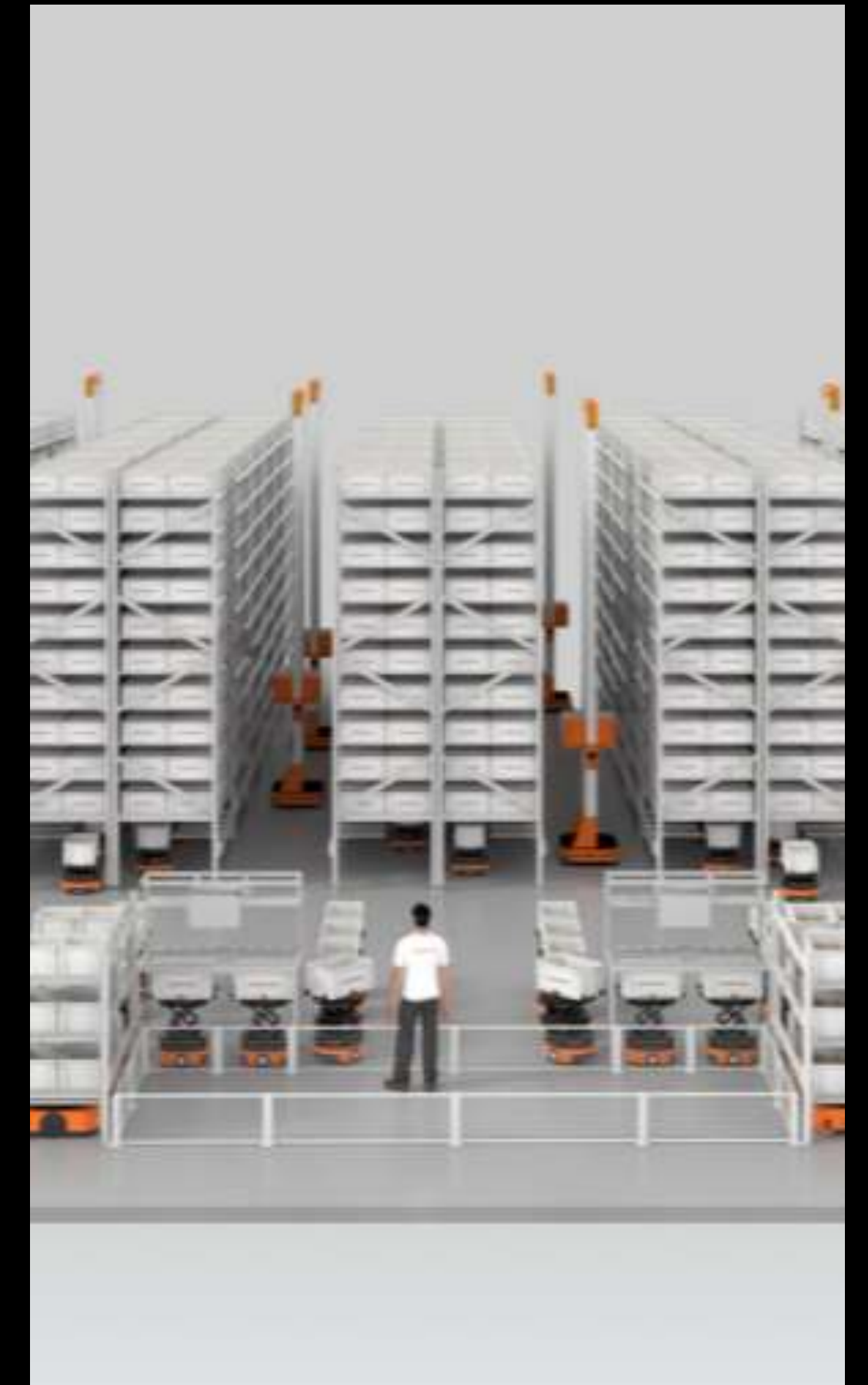
Quicktron

Dynamic Storage

Task Allocation

Storage Assignment

Order Wave Picking
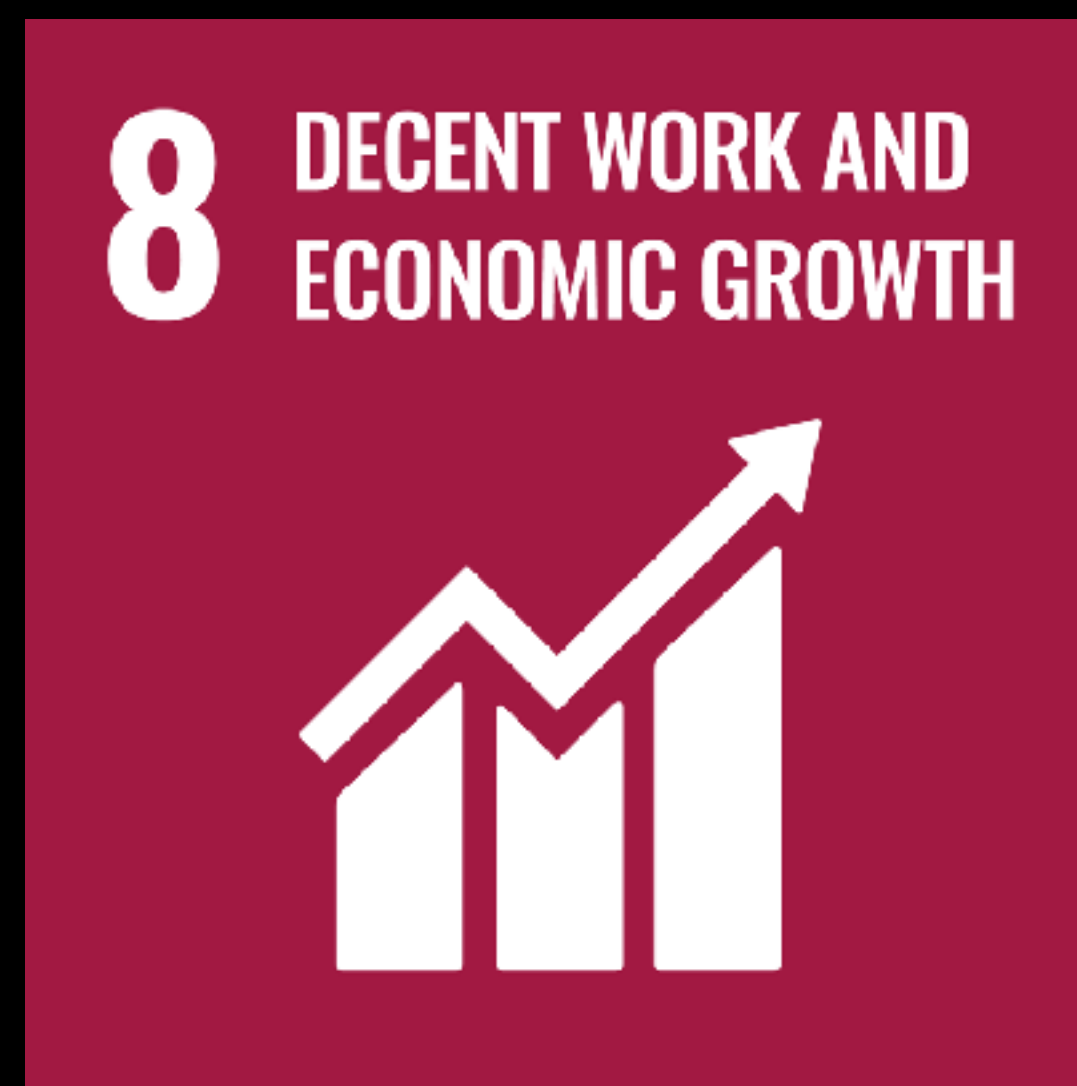
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KEY FACTS

INDUSTRY: **Smart Warehousing / Logistics**

FORMATION: **2014 in Shanghai**

FUNDING STAGE: **Series D (2023)**

URL: https://www.quicktron.com

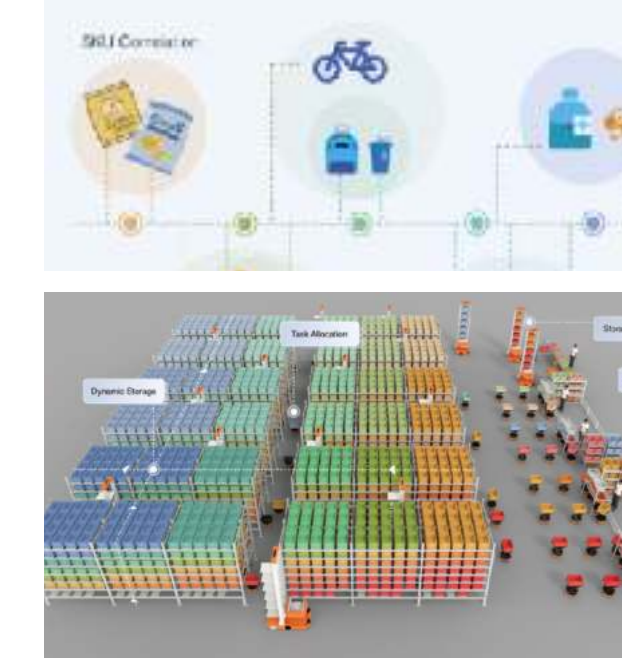**CHINESE NAME:** Shanghai Smart Warehouse (Quicktron) Smart Technology Co., Ltd. / 上海快仓智能科技有限公司
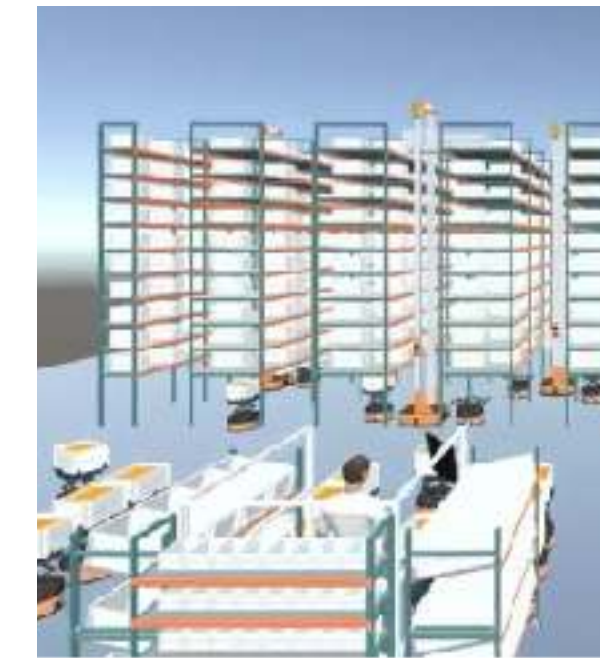
1. Simulation   **2. Operation**   **3. Forecasting**

Digital twin + physical execution / monitoring

SOLUTION

PRODUCT: **service robots and predictive order processing / optimisation** for smart warehouses

VALUE PROPOSITION: **cost reductions and time savings** through workflow optimisation, predictive order processing and improved storage

energy savings

MONETIZATION: **SaaS** (software-as-a-service), **RaaS** (robotics-as-a-service)

USP

- holistic **value delivery** system (storing - shipping - storing / restocking)

- **patented** software technology cov. the **entire workflow** of planning, operation, monitoring, forecasting & optimisation

- **advanced simulation algorithms** allowing for dynamic storage and order waves grouping

- **autonomous mobile robot (AMR) fleet** performing bin picking & moving, shelf/rack/pallet lifting & moving, goods transfer, point-to-point delivery

- **296 patents, 74 trademarks**

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FUNDING

FUNDING STAGE: Series D

LAST ROUND: April 14th, 2023

FUNDING RAISED: investment amount undisclosed
ca. $ 130,000,000 in Dec 2020 (C+)

REGISTERED CAPITAL: $ 7,200,000

MAJOR INVESTORS

- LEAD: KION (凯傲)
- Prosperity7 Ventures (Aramco)
- CCV Capital Partners (创世伙伴资本CCV)
- CITIC Venture Capital (中信创投)
- Linde Forklift (林德叉车)
- Bank of Communications (交银国际) et al. (20)

TEAM

- **Yang Wei, CEO & Chairman:**
  Master of Software Engineering from Peking University, research fields: machine learning, multi-agent system coordination and control

- **Sun Yu, Co-Founder:**
  Master of Natural Language Processing from Peking University, focus on data mining, data retrieval, big data processing, artificial intelligence, pattern recognition

- **Ni Fei, Co-Founder:**
  Doctor of Mechatronic Engineering from Shanghai Jiao Tong University, background in terminal automation equipment, automated rail cranes and port AGVs

- **Between 50 & 99 headcount (May 2023),** thereof 10 senior executives

DATE: MAY 2023   URL: https://www.quicktron.com

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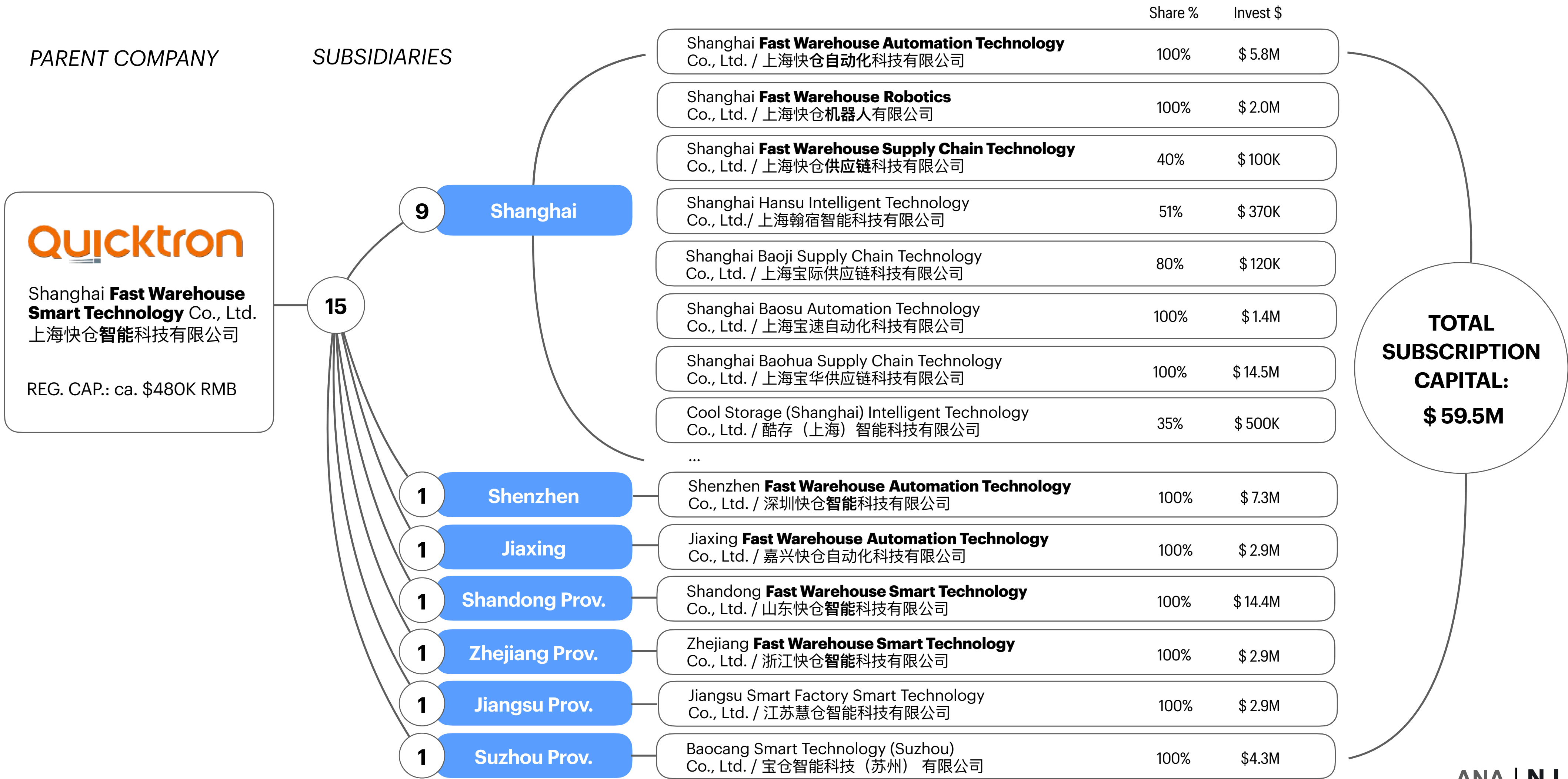
REMARKS

PROBLEM EXPLAINED: Problems of trad. warehouses incl. **high costs and failure rates**, rigid and **inflexible architecture**, high complexity and **redundancy**, slow and degrading performance, inadequate **storage space** (and inefficient use of available storage), plus the inability to **adapt to changing needs.** Smart warehouses help solve these issues. Additionally, there's a trend of growing demand for warehouse space (—> increased surface sealing & carbon emissions).

COSTS: Optimisable costs in warehouses: (a) **labor** costs (by automating manual tasks), (b) **energy consumption**, (c) **inventory** costs, (d) **transportation** costs, and (e) **maintenance** costs. The actual cost savings depend on the specific warehouse and the extent of automation implemented.

RELATED CARBON EMISSIONS: The inefficient operation of warehouses can lead to increased energy consumption, increased carbon emissions, and increased costs. According to a report by the U.S. Department of Energy[1], the **average energy consumption** for a 100,000 square foot warehouse is **approximately 6.1 million kWh per year.**

MARKET: The global smart warehouse market size is estimated to grow from USD 5.3 billion in 2020 to USD 7.9 billion by 2025 (+50%), with a Compound Annual Growth Rate / **CAGR of 15.6%** from **2021-2028.**[2] Anticipated growth of mobile robot (AMR) market: **5x from $3.6 B to $18 B** (2021-2025). The cost savings potential of smart warehouses is expected to be significant. Exemplary cost saving estimates: labor: 50%; inventory: 30%, energy: 25%, maintenance: 10%.

REGULATORY STATUS: The EU & US are pushing smart warehousing as an effective way to improve the efficiency & decarbonisation of supply chains. Operators are expected to achieve **100% net zero-carbon warehousing by 2050**.

SCALABILITY: Can be applied in multiple warehouse scenarios, covering **various sizes** and **levels of automation**.

IMPACT TIMELINE: Unlike many established competitors (domestic & international), Quicktron is **highly flexible** to implement tailored solutions **today**.

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Quicktron

CONCLUSION

COMPETITIVE ADVANTAGE (TODAY):

I. SERVICE SPECTRUM:

Simulation + operation + forecasting

Quicktron covers the full service spectrum of WH[1] automation <u>incl. hardware & software</u>, and builds a <u>DIGITAL TWIN</u> that not only helps with execution, monitoring and optimisation, but also forecasting.

We assume that, with its scalable solution, Q[2] will help
- **lower the entry hurdles** for the automation of warehouses of all sizes,
- **accelerate upgrading & decarbonisation.**

II. TECHNOLOGY:

Quicktron has profound knowledge in future key technologies such as **machine learning, multi-agent system coordination** and **big data analytics.**

The startup has the potential to **become a key player in the field** given the team's strong focus on the provision of value add rather than products.

OUTLOOK

CHALLENGE — MULTIDIMENSIONAL SCALING

Pilot projects in multiple industry segments have been concluded successfully.[3] Further scaling the solution in **scope** while maintaining robustness, speed and excellence in **increasingly complex real-time** operations will be the key to securing market leadership.

The startup's current key metrics include:
- **order receival-to-dispatch** (min),
- **picking speed** (Q[2] benchmark: 400 order lines/h, 2-4x manual picking),
- **throughput** (Q benchmark: 400 bins/h/aisle, 6000 bins/h/WS —> depends on # robots),
- **scalable system** (Q benchmark: easy up-/down-grading by customer, ROI: 1-2 years),
- **labor cost savings** (Q benchmark: 40-80% (use case specific),
- **accuracy** (Q benchmark: 99.9%, red. of # returns due to picking errors),
- **storage capacity** (Q benchmark: incr. by 80%)

Targets are subject to customer requirements and dependant on the respective use case.

OPPORTUNITIES

I. DARK WAREHOUSE LOGISTICS

Given the team's strong tech background and the growing importance of **100% net zero-carbon warehousing**, "**dark warehouse logistics**" could be an interesting focus for the startup going forward.

The extension of Quicktron's tech stack combined with investments in this field could help extend Qicktron's competitive advantage and accelerate its growth.

II. ADDITIONAL USE CASES

Quicktron could further **extend its use case coverage** (currently focused on small to medium parts; pilots include: <u>B2C</u>: e-commerce, apparel, cosmetics, pharmaceutical, electronics, automotive; <u>B2B</u>: 3PL[1], PCB[2], lithium batteries).

Pilot projects with the automotive and photovoltaic industry indicate that this is a direction being evaluated by the startup at present.
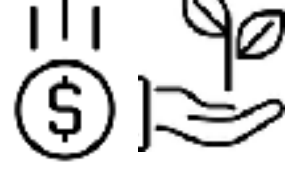
III. SMART FACTORY LOGISTICS

Smart factory logistics could be an additional space for Quicktron to enter since it provides access to even broader opportunities long-term.

Important prerequisites are that (a) respective collaborations are built early on and (b) Quicktron reaches a robustness and speed which proves to be compatible with complex manufacturing environments.

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IMPACT ANALYSIS

		TACKLED			PART. TACKLED
IMPACT FACTOR	local market excellence	global scalability	sustainable business model	actionable solution	educational & transformative
YES / NO	**IN CHINA**	**FROM CHINA TO GLOBAL**	**MEASURABLE IMPACT FACTORS**	**STAKEHOLDER AGNOSTIC**	**DISRUPTIVE MODEL**
	▶ Multiple high quality pilots with local & intl. customers in CN, strong team & funding.	▶ The solution can be applied in any other market with immediate effect. ▶ Expected international rollout (short/mid-term): • Asia • Europe	▶ The economic impact of the solution is substantial & measurable. ▶ Business model seems feasible & sustainable. ▶ CO2 reduction & climate impact tbd.	▶ Available software & hardware packages allow for flexible scaling and offer actionable solutions for multiple warehouse sizes / industries (short/mid/long-term).	Concepts exist to disruptively transform the tech space via AMR, AI & data mining. ⊗ Education desirable on how to gradually upgrade smaller warehouses.

> The startup is solving a problem of <u>high global relevance</u>.
> <u>Educational campaigns</u> should be installed to <u>further increase the outreach</u> of the project and <u>guide traditional warehouses</u> on gradually upgrading their premises.

Quicktron

"This startup has the potential to disrupt the smart warehousing space with its <u>holistic</u> digital twin solution on a <u>global scale</u>. China provides the <u>perfect prototyping</u> platform for <u>complex</u> use cases which will likely lead to <u>fast acceleration and growth</u>."

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