WORKING PAPER SERIES

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January 15, 2026

No. 282

The Research Institute for Innovation Management, HOSEI UNIVERSITY

Case Study of Chinese Smart-Logistics Equipment Firms (2): The Rapid Growth and International Expansion of Senad, a Dynamic Dimensioning Weighing Scanning Equipment (DWS) Manufacturer

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Against the backdrop of explosive expansion of e-commerce demand, Chinese smart logistics equipment manufacturers are rapidly strengthening their presence in global markets. Among them, Senad was founded in 2012. Breaking away from its former engineer-to-order model, the company has leveraged "product standardization" and a "relentless on-site mindset" to develop high-performance, cost-competitive products. With major Chinese e-commerce firms as customers, Senad has locally secured a firm position and is now focusing on overseas markets, including Japan.

On March 6, 2025, the authors visited Senad headquarters in Jiading District, Shanghai, and interviewed its founder/CEO, Mr. Li Hua, and CTO, Mr. Wang Yishan. Based on the interview, this paper traces how Senad pivoted from an industrial automation manufacturer to a logistics specialist, the path of its rapid growth, the key drivers behind its success, and its detailed strategy for the Japanese market.

A Dramatic Shift: From "Engineer-to-Order" to "Standardization"

When Senad was founded in 2012, China's manufacturing sector boomed, with new factories built at a blistering pace. Senad's core products are automation devices indispensable to production lines — programmable logic controllers (PLCs), control systems, and similar equipment — and the company grew by tapping into surging demand. However, the business model was engineer-to-order, and the specifications were customized for each client.

Although this model is seemingly conducive to customer satisfaction, it is highly inefficient. Because product design, parts procurement, assembly, and warehousing changed from project to project, productivity gains were elusive, and managing lead time and cost was perpetually difficult. Rising labor costs and component prices in China have hit margins, turning project-by-project customization into a major brake on growth. Management became more certain about their concerns regarding the

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company's future outlook.

Figure 1. Senad's Headquarters and R&D Center.

Searching for a New Business Domain: Turning to Smart-Logistics Equipment

To break this impasse, Senad began a fundamental restructuring and set a management policy of "pivoting to product areas amenable to standardization." The new battlefield would be smart logistics.

There were two reasons. First, warehouse operations such as sorting and conveying are highly common across industries and companies, offering a strong potential for "horizontal deployment" of identical equipment across sites. Second, the explosive growth of the e-commerce market increased parcel volumes annually, driving the need for automation, labor saving, and cost reductions, which reached a boiling point.

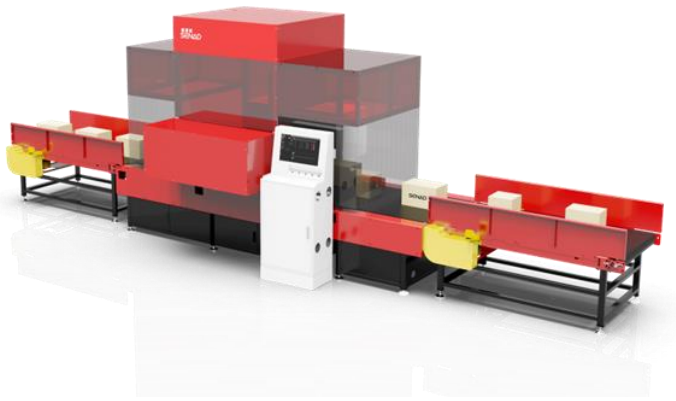
Concluding that smart logistics would deliver continuous revenue, Senad entered the field in 2015. This was not a simple new business launch, but a high-stakes corporate transformation. Resources were reallocated, and a dedicated development team of algorithm engineers and mechanical designers was formed. By leveraging its expertise in precision control technologies and the rigorous quality management developed within the field of industrial automation, Senad initiated the development of innovative and adaptable logistics equipment.

Positioning DWS as the Core product: Discovering Market Opportunity and Building Through "On-Site" Development

After entering smart logistics, Senad focuses on dynamic dimensioning, weighing, and scanning

(DWS) systems that instantly read parcel dimensions, weight, and barcodes on a conveyor. Similar products existed from overseas makers but were expensive—prohibitively so for operators with many logistics facilities or for small and medium-sized enterprises (SMEs) with limited investment capacity. Senad spotted a market gap and set a clear strategic goal to develop a domestically produced DWS that matched overseas performance at a much lower price.

Figure 2. DWS Developed by Senad.



Development proved to be challenging. Some logistics sites operate under harsh conditions, making the twin goals of "accuracy" and "stability" particularly difficult. For instance, liquid containers or irregular items with shifting content can produce unstable weight readings owing to conveyor vibrations. In China's northern hubs, low temperatures and wind affect device behavior. In the south, high humidity and varied warehouse lighting can throw off optical sensors. Soft "bagged" parcels and irregular shapes—now common—often stumped conventional sensors for dimensioning.

Senad's team did not remain cloistered in the lab: it pursued solutions through a rigorous "on-site" approach. The company collected and analyzed vast amounts of real-world data from logistics sites nationwide and developed proprietary control algorithms to correct vibration-induced measurement errors in real time. It also optimized the optical design and lighting layout to stabilize the measurements for bagged and irregular parcels.

The most emblematic aspect of this philosophy was the insistence on field validation. Once a prototype was ready, Senad immediately brought it to partner sites and repeatedly ran thousands to tens of thousands of real parcels through it. Using the resulting data, the team iterated the improvements and verified them in the field. By rapidly turning this feedback loop, the product evolved beyond

theoretical specs into one with the “operational reliability that truly works on site.”

Market Penetration and Forward-Looking Product Strategy

Through this cycle of on-site iteration and feedback, Senad’s DWS achieved accuracy on par with overseas products while holding down costs, which led to its rapid adoption, especially among major e-commerce platforms. In particular, the “single-unit” model that can be integrated into existing lines without replacing the entire system won overwhelming support from small and medium-sized operators seeking flexible capital expenditure. Consequently, Senad captured a solid share of China’s logistics equipment market with its DWS, which has become the backbone supporting company growth.

Figure 3. DWS Deployed on Site.

However, the true value of the DWS system extend beyond the success of a single product. The cargo-attribute data accumulated through DWS products, together with the vertical algorithms developed for the logistics domain, will serve as the digital foundation enabling real-time coordination between future sorting systems and the company’s next-generation loading and unloading robots. In short, DWS is both a current revenue driver and a strategic core for Senad’s future “fully automated logistics” solutions.

Seeking Sources of Advantage in Technology, Organization, and Corporate Culture

The senior management of Senad believes that a firm’s competitive strength can not rely on a single product or technology. Instead, it should come from the mutual reinforcement of technological development, production, and organizational structure.

Speed and Quality via Vertical Integration.

A defining hallmark of the company is that it develops its hardware, software, and algorithms entirely in-house. From structural design and control systems to core algorithms and user interface software, virtually all key technologies are developed internally. This eliminates outsourcing-related delays and quality variability, enabling an agile development setup that feeds onsite feedback into product improvements at a remarkable pace. In particular, proprietary algorithms that maintain accuracy under fluctuating conditions unique to logistics sites—temperature, humidity, dust, and lighting—form the core of the company's competitive advantage.

Operational Flexibility Balancing Quality and Cost.

The company operates a factory in the Machine Vision Industrial Park in Jiaxing, Zhejiang, which is home to high-tech clusters, optimizing production costs and logistics efficiency. While some machined parts are outsourced, final assembly of the product "heart" is kept in-house for strict quality control. Domestic and imported parts can be flexibly used in procurement. For critical components, Senad switches to alternatives as needed to satisfy certifications (CE, UL, JIS, etc.), enabling a quick market response.

An On-Site-Rooted Development Organization.

Senad places strong emphasis on R&D, holding over 160 intellectual property assets, 18 invention patents, and more than 90 software copyrights. Over 40% of its approximately 150 employees work in R&D. Cross-functional teams — structural, control, software, and algorithm engineers — drive each project and foster the fusion of domain knowledge. The notable concentration of control engineers reflects the primacy of safety in logistics machinery. The team's code of conduct is "deep immersion at the customer site," where co-solving real problems becomes part of the product's value and cements long-term customer relationships.

Expanding from "Points" to "Planes": The Challenge of Loading/Unloading Robots

With DWS establishing a market foothold, Senad turned to further automating logistics processes by developing loading/unloading robots, targeting labor-intensive and physically demanding steps, such as loading trucks and unloading containers. R&D has accelerated around 2021, and multiple models are currently in mass production and deployed at sites nationwide, supporting tasks such as general loading/unloading, box-truck handling, and specialized in-facility transport.

Figure 4. “iLoabot-M” Autonomous Loading/Unloading Robot.

In addition, in-house development is central. A proprietary sensing module with an ultra-wide field of view (FoV) captures the vehicle interiors and cargo in a single shot. Structural innovations include reducing the route angles for loading/unloading by 50% compared to common industry approaches. Senad also has a suction-type end-effector with a controllable range that adapts to diverse parcel shapes, weights, and materials. For safety purposes, a self-closing valve prevents a full drop even if partial suction is lost.

Figure 5. Self-closing Valve Safety Mechanism in the Unloading Robot.

Advanced control algorithms do more than lift cargo; sensors detect slight misalignments in the container orientation and placement, and the robot auto-adjusts its motion. Multiple robots can operate cooperatively without interference, maintaining high throughput not only in ports and warehouses, but also within tight, irregular spaces such as vehicle bodies and containers.

By utilizing its extensively accumulated datasets and comprehensive expertise in logistics environments, Senad accelerates deployment by pretraining robots during the research, development, and acceptance testing phases. By combining in-house hardware with a vision-based multimodal recognition system, the company's AI logistics robots can adapt to varied environments, parcel forms, sizes, and materials, covering tasks ranging from loading/unloading to palletizing/de-palletizing. Senad has developed what it calls an industry-first multimodal Vision-Language-Action (VLA) vertical large model, establishing a stack of "proprietary algorithms, industry data, industry-specialized models, and real-world training." This underpins the strong impact of adaptability and deployment.

Today, products such as the "iLoabot-M" and "iLoabot-P" autonomous palletizing/de-palletizing robots are well-regarded by major firms in logistics, e-commerce, alcohol, and tobacco, and have been introduced into logistics centers, warehouses, and factories. Senad also focuses on new verticals—apparel/footwear, food and beverages, toys, and gifts—where loading/unloading needs are growing and are being validated by the market.

Figure 6. "iLoabot-M" Deployed on Site.

Evolving into a "Service-Integration Company"

Senad's marquee customers include EMS (China Post), SF Express, JD.com, Cainiao, and J&T Express in logistics, as well as Three Squirrels (food e-commerce), Vipshop (fashion e-commerce), and POIZON Global Ltd. (lifestyle e-commerce). The efficient processing of massive daily shipments is the essence of competitiveness for these firms.

Senad does more than sell equipment: it provides comprehensive post-deployment support to ensure stable operations, rapid supply of consumables, remote guidance for part replacement, and regular inspections by dedicated service managers for large accounts. This robust after-sales capability builds trust and shifts the business from a "product-provider" to a "service-integrated" value provider, forming the basis of long-term partnerships rather than short-term sales.

Global forays: Positioning Japan as the "Stage for Brand Building"

Building on its domestic position, Senad began full-scale overseas expansion in 2019, initially targeting Southeast Asia, which is geographically and culturally proximate and has a fast-growing e-commerce market. In Vietnam, Thailand, and Malaysia, rising labor costs have heightened the appetite for automation, and Senad's DWS has quickly gained traction. The company entered Korea early, supplying DWS and sorters via distributors. Overseas revenue has been growing 10–20% annually, with the medium-term goal of raising the share to more than 30%.

Among global markets, Japan is a strategic priority, but Senad's approach is highly deliberate. The company views Japan as a "stage for brand building": barriers to entry are high, but once trust is earned, relationships are long-term. Senad products already carry international certifications, such as International Organization of Legal Metrology (OIML) and European Conformity (CE). The company is strengthening partnerships with local distributors, building Japanese-language sales and support, and planning live demonstrations, such as exhibiting at international logistics exhibitions like Logis-Tech Tokyo in autumn 2025 and at the Kansai Logistics Expo in Osaka, to showcase performance and stability directly to prospective customers. Clearing Japan's demanding standards and earning high evaluations there will serve as a powerful "quality credential" for entry into other advanced markets. Success in Japan is a strategic move to increase global brand value beyond sales.

Figure 7. International Standardization Certificates.

A Corporate Culture That Transforms Failure into Learning

Senad's current strategy was forged through previous lessons on pain. A symbolic case is a deeply discounted, customized project intended to win a price war against a competitor. After order capture, complex site-specific specification changes continued to arise, triggering unplanned work. Deadlines slipped, profitability deteriorated sharply, repeated changes exhausted field engineers, and hurt resource allocation for other key projects.

From this, Senad internalized that "low pricing does not necessarily yield sustainable competitive advantage." The company now prioritizes "standardizable" over price when deciding whether to accept orders. Projects that deviate substantially from standard specifications or clients who focus solely on price are evaluated with heightened caution, even if they are large. Crucially, the company shares internal failure processes, performs root cause analyses, and implements fixes. Rather than hiding failures, the Senad learns from them and builds systems to avoid repetition.

In the future, Senad plans to go beyond standalone products like DWS and loading/unloading robots and to strengthen "fully automated logistics" solutions that orchestrate multiple devices domestically and abroad. This solution enables customers to achieve end-to-end processes from inbound to outbound, while allowing Senad to establish a stable revenue base through long-term service and maintenance contracts. In the highly competitive manufacturing environment, Senad continues to explore a viable model for evolving into a "solutions company" built on technology and customer

relationships—one that can establish a sustainable competitive advantage.

Acknowledgment

This work was supported by JSPS KAKENHI (Grant Number 23K01655) and the Research Institute for Innovation Management at Hosei University.

We would like to express our deep gratitude to the top management of Senad, who responded to our interviews.

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