

Japan's Builders Rethink Construction for New Realities

Japanese firms are reshaping construction through 3D printing, labor-saving technology and Asian expansion. BY DANIEL DE BOMFORD

Japan's construction industry is shifting from expansion to adaptation, as aging infrastructure, labor shortages, rising costs and overseas growth drive innovation in maintenance, mobility, digital platforms and 3D-printed housing models. RAIZNEXT begins with the infrastructure Japan already depends on. Its role is to keep refineries, petrochemical plants, storage tanks and manufacturing assets safe as they age and become more important to energy security. President and Representative Director Teruhiko Mouri described the new standard clearly: "As facilities age and become more strategically important, the quality and sophistication of maintenance work must continue to improve."

The same logic is brought into cities by Hitachi Building Systems Co., Ltd., where elevators, escalators and building systems shape daily life. As Japan faces higher costs and fewer workers, the company is using data, AI and robotics to make buildings more efficient. "This applies not only to the operation of the elevator itself, but also to how it is installed and maintained," President and Representative Director Takeshi Yamamoto said. Reliable machinery remains essential even as construction becomes more digital. Toyo Kensetsu Kohki Co., Ltd.'s rebar processing equipment is built for precision, durability and after-sales support in markets where downtime can

stop a project. The company's strength, President Ryoichi Hata said, comes from experience: "Over the past 67 years, we've continuously refined our products and services based on direct customer feedback." SpiderPlus & Co. addresses the daily inefficiencies of construction sites. Its platform turns drawings, inspections, photos and reports into shared data, helping contractors work faster and with clearer accountability. President and CEO Kenji Ito said the product was designed for workers with limited IT experience, guided by one principle: "If it isn't simple, it won't be used."

Lib Work Co., Ltd. applies that need for productivity to housing. As Japan's skilled carpenters age, the company is using digital platforms and 3D printing to make homes more affordable and less dependent on scarce labor. President and CEO Chikara Seguchi said the goal is to "help reduce costs, raise productivity, and create systems that make it possible to build efficiently."

V3D Asia Inc. brings Japan's construction strengths to Southeast Asia, where housing demand is high and cost matters. By locally sourcing materials and developing simple, rugged, structured printers, their model responds ideally to the local demand. Kazuhiro Ono, CEO and group chairman, said, "By combining material science with robotics, we created a solution that integrates both technologies and enables new approaches to construction."

Sharp Energy Solutions Corporation starts from the country's most basic challenge: energy security. "I have always believed that solar power can become Japan's equivalent of an oil field," President and Representative Director Hirozumi Gokaku said. From rooftops to space-grade solar cells, Sharp is treating renewable energy as infrastructure.

Building Asia's Future Through Japanese Rebar Processing Excellence

Toyo Kensetsu Kohki combines Japanese craftsmanship with customer feedback to deliver durable rebar processing machines worldwide. BY DANIEL DE BOMFORD

Japanese manufacturing is known for craftsmanship, reliability and uncompromising quality. Toyo Kensetsu Kohki brings these strengths to rebar processing, developing machines built for Japan's demanding construction industry. "Because rebar is delivered just before construction, machine reliability is critical," said President Ryoichi Hata. "Even brief downtime can delay projects and result in major losses." As India continues to expand its infrastructure, demand for durable and efficient rebar processing solutions continues to rise. Designed for demanding job sites, Toyo's TBS-25-NC4RV automatic rebar bending machine delivers high productivity, stable performance and consistent quality while reducing labor and improving workflow. Built to last up to 30 years, its machines offer an outstanding cost-to-performance ratio, making them a reliable long-term investment. Proven in Japan's Shinkansen construction projects, Toyo's rebar processing machines have consistently delivered reliable performance. The company will showcase its machines at upcoming exhibitions in India. Alongside reliable equipment, Toyo is expanding its sales and service network across Asia to provide responsive technical support and after-sales service. By combining Japanese engineering with local expertise, the company aims to become a trusted long-term partner for customers throughout Asia.

"We've continuously refined our products and services based on direct customer feedback, ensuring reliable performance and long-term value for our customers."

Ryoichi Hata, President
Toyo Kensetsu Kohki Co., Ltd.



Sharp Takes Solar Value Chain Global

From Southeast Asian rooftops to lunar missions, Sharp is turning Japanese solar expertise into a global clean energy value chain. **BY DANIEL DE BOMFORD**

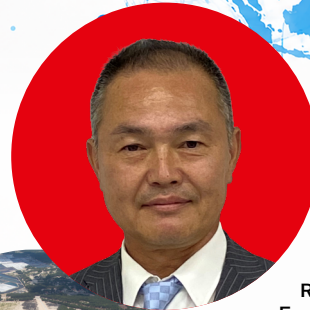
A parent switches on the kitchen light before sunrise, starts the kettle and checks the weather while the house slowly comes to life. These moments once relied on burning fuel at stations miles away, but now, they can be powered from the family's roof. Solar energy is becoming part of the everyday power people depend on, helping keep homes, workplaces and communities moving with cleaner electricity. As climate change action and recent supply shocks driven by geopolitical tensions spur renewable energy development and adoption, Sharp Energy Solutions Corporation has brought Japan's advanced technology to Southeast Asia and all the way into space.

President and Representative Director Hirozumi Gokaku said that energy security is no longer just an environmental concern: "It has become directly tied to energy security, industrial competitiveness and the long-term stability of national economies."

The company brings more than six decades of solar expertise to a global market seeking cleaner, smarter power. From residential rooftops and factory installations to megawatt-scale solar plants, storage batteries, HEMS (Home Energy Management Systems) and after-sales service, Sharp offers an integrated value chain built on Japan quality. Its capabilities span engineering, procurement and construction (EPC), independent power producer (IPP) and operation and maintenance (O&M), with rigorous in-house testing designed for long-term performance in demanding environments. In Asia and beyond, Sharp is positioning solar as practical infrastructure for decarbonization, energy security and sustainable industrial growth.

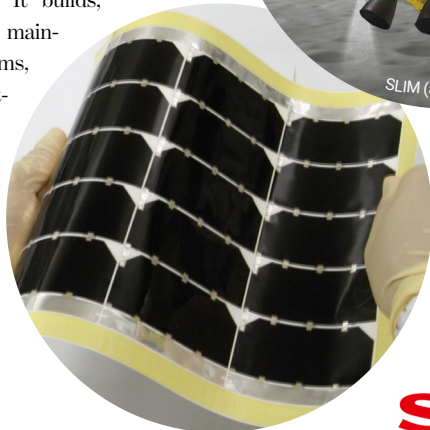
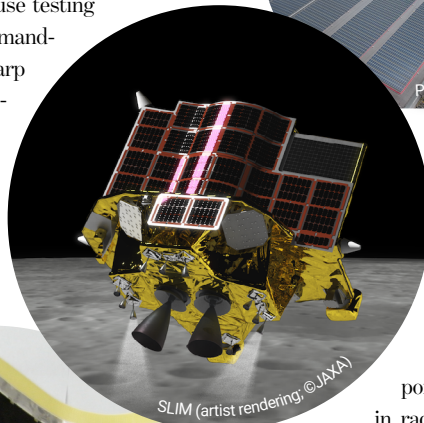
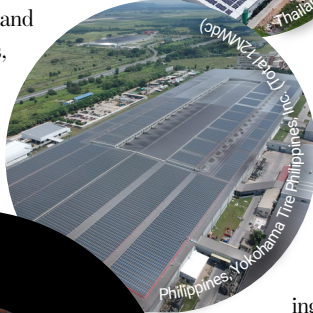
From Japan to the World

The company's Southeast Asia strategy is a comprehensive, regional energy-services model. It builds, operates and maintains solar farms, while supporting corporate decarbonization through rooftop solar, adapted to



"I have always believed that solar power can become Japan's equivalent of an oil field."

Hirozumi Gokaku, President and Representative Director, Sharp Energy Solutions Corporation.



each country's regulatory and infrastructure environment. It has already completed projects in Thailand, Vietnam, Indonesia and the Philippines, the latter of which Gokaku describes as one of the markets becoming increasingly attractive in the region.

"The Philippines has been relatively open to foreign manufacturers and international participation, and I believe that openness creates significant long-term potential," he said. As an island nation, the decentralized nature of its electricity grid makes it well-suited for renewable energy, which can provide greater access to energy, stability and resilience. "We are already building relationships and partnerships within the country, and through those networks we believe we are in a position to develop broader value chain activities, including EPC and PPA (Power Purchase Agreement) businesses," Gokaku said. He believes that while other Southeast Asian countries require careful localization, the opportunities are still significant.

Space, the Final Frontier

Sharp's collaboration with JAXA gives its solar business a distinctive frontier. Certified for space use since 1972, Sharp's high-reliability cells have powered about 190 satellites and supported missions including JAXA's SLIM lunar lander. That record in radiation, temperature extremes and weight-sensitive design reinforces Sharp's broader promise of solar technology engineered for the toughest environments. Its extraplanetary ambitions have very real effects on the ground, with the technology developed helping to create the next generation of more efficient panels. For a family and their community, that means greater energy independence and a brighter future.



SHARP
In step with your future.

<https://global.sharp/solar/en/>

Hitachi Building Systems Advances Urban Mobility

Hitachi Building Systems combines Japanese engineering, AI and global expertise to make urban infrastructure smarter.

BY DANIEL DE BOMFORD AND CIAN O’NEILL

7:30 a.m., Tokyo, an office worker enters the elevator in their apartment building and begins their day. 7:45 a.m., Kichijoji Station, the worker rides an escalator to platform 4. 8:10 a.m., another escalator trip to transfer. 8:30 a.m., enters the elevator at the office. At lunch, he takes the elevator back down to the ground floor. On a given day, a person might interact with an elevator or an escalator more than 10 times without even noticing. A single breakdown in the chain could be catastrophic.

Perhaps the greatest boon of the building infrastructure in the 20th century was the ability for cities to build up, rather than out. Hitachi has around 100 years of experience in the elevator business and understands the necessity of reliability for this vital infrastructure. Hitachi began research and development of elevators in the 1920s, expanded into installation in the 1930s and has continued pushing the boundaries of speed and functionality. In 2017, it achieved the world’s fastest elevator at 1,260 meters per minute. The company has built a global network spanning more than 20 markets, with a particularly strong presence across Asia, including India.

Now, under the leadership of Takeshi Yamamoto, who leads Hitachi’s building systems business, the company looks to new opportunities as the market shifts and digital technologies disrupt traditional workflows. Yamamoto brings experience from both corporate leadership and engineering, having led the development of the building management system for Kansai International Airport, and sees productivity and efficiency as essential as the construction landscape dramatically shifts.

Digitalization in a Constrained Construction Market

Currently, Japan’s construction market remains relatively flat in terms of new buildings. However, with rising material costs, increasing labor costs and a weakening yen, prices continue to rise. “Even though the number of projects is stable, the overall scale of investment continues to increase,” Yamamoto said. At the same time, Japan’s aging building infrastructure needs maintenance, and according to Yamamoto, the renewal and replacement market has become “significant.” The industry is no longer focusing on new construction; maintenance and upgrades are becoming increasingly important. To further complicate matters, Japan’s rapidly aging population and declining workforce already show clear signs of future labor shortages, which are expected to become increasingly severe, creating structural constraints within the industry. This is more than a temporary cycle and represents a



“We aim to contribute to the development of more advanced, efficient and intelligent infrastructure on a global scale.”

Takeshi Yamamoto
Head of Building Systems Solutions & Services Business Management Division, Urban Solutions & Services Business Unit, Hitachi, Ltd. and President and Representative Director, Hitachi Building Systems Co., Ltd.

permanent shift; Japan must care for an increasingly large stock of existing buildings.

The challenge, as Yamamoto describes it, is the integration of digital technologies and new methods of working. “It is no longer just about scaling up resources, but about finding ways to do more with fewer people. That is why digital technologies and new operational approaches are becoming increasingly important for the industry as a whole,” he said.

Hitachi provides not only elevators and escalators but also a wide range of building systems, including HVAC equipment and building management systems, positioning itself to respond to these changes.

The Hitachi Group Advantage

A key strength of Hitachi lies in its integration with the broader Hitachi Group, which possesses extensive digital and IT capabilities. Unlike typical elevator manufacturers, Hitachi can leverage advanced digital technologies across its group to enhance building systems and services.

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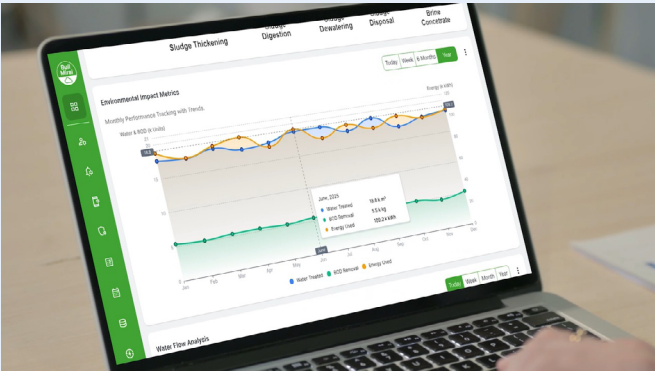
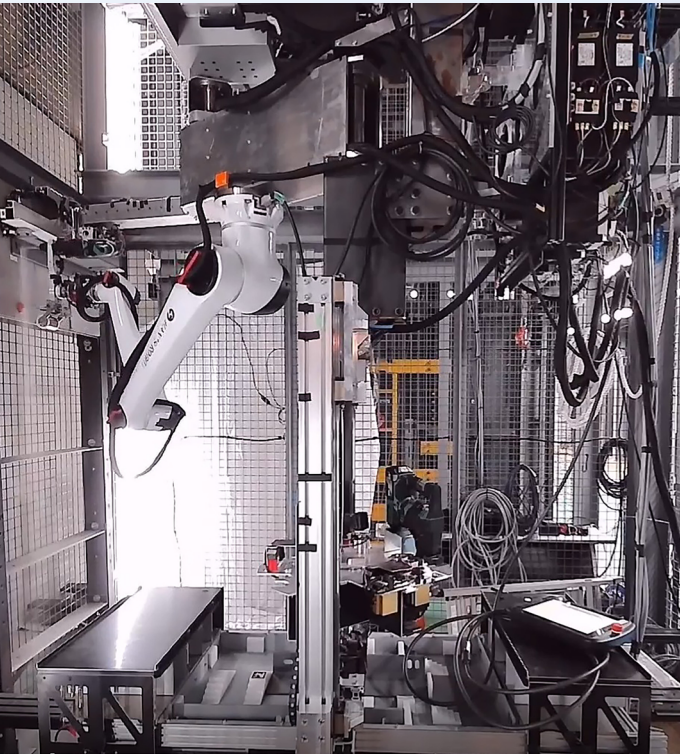
“By combining these digital strengths with the reliability of the Hitachi brand and our established quality standards, we are able to respond effectively to customer needs,” he said.

Data, AI and Future Technologies

Digital technologies are proving indispensable for data-driven operations. For more than 30 years, Hitachi has developed preventive maintenance technologies using operational data. In 1995, it launched remote monitoring and maintenance services using real-time data, and currently monitors over 180,000 building facilities in Japan. These capabilities have been built over multiple generations of development, including early-stage challenges and continuous iterative improvements. “The core concept is to identify potential issues in advance, such as components that are likely to deteriorate, and address them before they lead to failures,” Yamamoto said. “This reduces unnecessary maintenance visits and lowers overall costs.”

A central element of Hitachi’s digital strategy in building systems is its next-generation solutions suite HMAXTM for Buildings, which combines extensive installed base data (digitalized assets), Hitachi’s domain knowledge and advanced AI technologies. One of its core platforms, BuilMirai, integrates data from elevators and various building systems to enable optimized building management and improved user experience for both building owners and users. This platform enables predictive maintenance, operational efficiency and reduced downtime. Importantly, BuilMirai is designed to operate in a multi-vendor environment, allowing integrated management of buildings where equipment from multiple manufacturers coexists. Yamamoto said that it is no longer possible to talk about the future of elevators without considering AI. “Our vision is to create elevators that integrate both AI and robotics,” he said. This applies across the entire production chain, from installation to day-to-day operations.

For example, in elevator installation, aligning landing components on each floor has traditionally been a manual and labor-intensive process. Hitachi uses actuators to automate this process, significantly improving efficiency and consistency. The company is also working toward the development and implementation of robots to automate the installation itself.



In terms of AI, he sees it tied intrinsically to the evolution of elevators. “One concept we are exploring is the development of AI-driven robotic elevators,” he said. “These systems would be able to communicate with users, optimize their operation in real time and even perform self-diagnosis.” Eventually, systems could predict and identify faults and take action to autonomously respond to issues.

From East Asia to Wider Growth

Hitachi expanded into Asia through overseas construction projects led by Japanese companies and established local subsidiaries and operating bases. Starting in Hong Kong in the 1960s and Singapore in the 1970s, the company established subsidiaries in Thailand, China, India, the Philippines, Myanmar, Cambodia and Vietnam.

The company’s growth has been particularly strong in neighboring countries. “We have achieved the number one market share in China, the world’s largest elevator market, for eight consecutive years, and also hold the top position in Taiwan. These achievements reflect our strong global competitiveness,” Yamamoto said. Now, it looks to emulate its strategy in ASEAN.

The Changer of Building Systems

Yamamoto said Hitachi Building Systems is pursuing two directions: the evolution of elevators through technology and integration with Hitachi Group’s broader capabilities, including energy systems, security platforms and digital technologies. When asked how he defines the company, he summed it up simply: “We are transforming building systems.”

HITACHI

Hitachi Building Systems (Japan) <https://www.hbs.co.jp/coguide/corporate.html>
Hitachi Elevator & Escalator Global Network
https://www.hitachi.com/businesses/elevator/corporate/global_network/index.html



RAIZNEXT Advances Japan's Plant Maintenance Leadership

RAIZNEXT is strengthening Japan's industrial backbone through advanced plant services, plant lifecycle maintenance, sustainable engineering and a clearer investor strategy. BY DANIEL DE BOMFORD AND QUENTIN LANGE

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“As facilities age and become more strategically important, the quality and sophistication of maintenance work must continue to improve.”

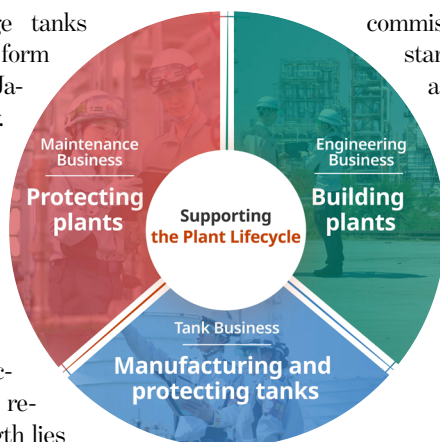
Teruhiko Mouri

President and Representative Director,
RAIZNEXT.

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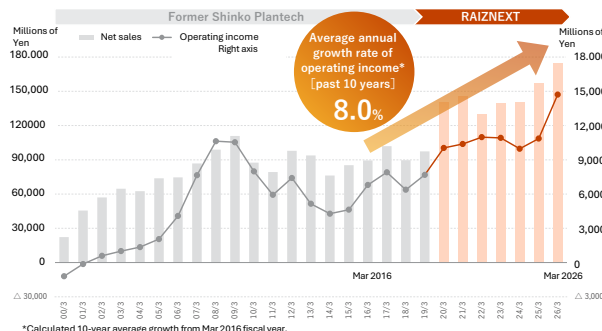


Steel towers, storage tanks and miles of piping form the backbone of Japan's industrial economy. For RAIZNEXT, keeping that infrastructure running safely is a growth business. The plant engineering and maintenance company supports facilities across the full lifecycle, from design and construction to daily maintenance, repair and renewal. Its strength lies in close customer contact at operating sites, where recurring maintenance work creates a stable base and often leads to larger modernization, revamping and construction projects. President and Representative Director Teruhiko Mouri said that the plant lifecycle model is central to RAIZNEXT's value. “We are involved in every stage of the plant lifecycle, from feasibility studies, design, procurement, construction, and



commissioning to post-startup maintenance and eventual plant dismantling and removal. Rather than focusing solely on building facilities, we remain engaged throughout their operational life.”

holder return policy. The company has set its fiscal 2025 dividend of ¥117 per share as the minimum annual dividend and will pay whichever is higher: a dividend based on a 60 percent consolidated payout ratio or one based on 7 percent dividend on equity, giving investors a clearer framework for stable returns. Sustainability is another pillar. Under its philosophy of “Support Industrial Infrastructures, Create a Prosperous Future,” RAIZNEXT is pursuing car-



Changes in net sales and operating income

RAIZNEXT's revised Third Medium-Term Management Plan builds on that foundation. The company is targeting ¥195 billion (\$1.2 billion) in net sales, ¥16.3 billion (\$100.7 million) in operating income and ¥11.2 billion (\$69.2 million) in net income for fiscal 2028, with ROE of more than 10 percent. Its strategy centers on expanding orders from existing customer sites, capturing demand tied to decarbonization-related investment and increasing supply capacity through recruitment, M&A, digital transformation and mechanization. The plan reflects Japan's changing industrial landscape. Aging plants, stricter reliability needs, labor shortages and energy-security concerns are raising the value of companies that can execute complex maintenance and construction work safely. RAIZNEXT has also sharpened its share-

bon-neutral projects, emissions reduction, workplace safety, partner-company development, diversity, compliance and information security. Mouri said the company's role will expand with industry itself. “Whether the future involves new energy systems, advanced materials, semiconductors, or other technologies, those industries will require storage, manufacturing facilities, and maintenance support.”



<https://www.raiznext.co.jp/e/ir/>





V3D Asia Targets Southeast Asia's Housing Construction Gap

Japan's construction industry faces a paradox. While demand for infrastructure maintenance remains high, an aging population is cooling new demand and shrinking the labor pool. V3D Asia Inc. is turning these obstacles into the foundation for new construction models that use 3D construction printing technology to improve efficiency, reduce costs and expand overseas.

V3D Asia's approach combines materials science with robotics. The company began with cement-reducing nano-carbon technology and durable plastics that maintained strength after recycling. "Our strategy is built around the two main advantages of 3D construction printing: efficiency and free-form design," Kazuhiro Ono, CEO and group chairman, said. This approach allows the company to compete in markets like Malaysia, where demand for luxury housing is high, and Indonesia, where volume is required. "Our goal is not only to democratize 3DCP technology to meet this demand, but to transform exactly what the houses of the future will look like," Ono said.

Trust is vital when entering new foreign markets. V3D—through its commercial real

V3D Asia is using Japan's construction challenges as a blueprint for Southeast Asia, combining 3D construction printing, robotics and local partnerships to address housing demand and labor shortages.

BY
DANIEL DE BOMFORD AND LISA KAYASTHA

estate arm, Nuvah—has made inroads in Malaysia by working with SIRIM Academy to create the nation's first industry standard for 3D construction printing. These standards are crucial for credibility, helping regulators, developers and buyers treat 3D housing as bankable and scalable, rather than purely experimental. Dr. Mohd Bakri bin Jali, the covering CEO of SIRIM Academy Sdn. Bhd. said that industry standards are critical in supporting safe and structured adoption of emerging construction technology. "Through this collaboration with V3D Asia and Nuvah, SIRIM Academy brings its expertise in industry-standard development, training and certification to support the establishment of a credible and practical framework for 3D Construction Printing," he said. This initiative, he believes, will strengthen confidence, encourage innovation and facilitate conformity in



construction specialists, reinforcing its "Designed in Japan, Built in Malaysia" model with local expertise. That could help create a domestic base of specialized engineers, operators and project managers capable of turning 3D concrete printing from imported technology into an industry capability.

assessment and certification. V3D Asia and Nuvah are positioning 3D construction as a regional platform. Their mid-term strategy combines proprietary technology, local printer manufacturing, real estate development, participation in standards and future deployment of 3DCP systems and robotic arms for rental. The ecosystem appeals to investors seeking scalable exposure to Southeast Asia's housing and construction gaps and provides the company with multiple revenue streams.

Through its collaboration with Universiti Malaya, V3D Asia aims to help train the next generation of Malaysian 3D-printing

and cement Malaysia's position at the forefront of automated construction," Ono said.



SPIDER+ Drives Construction DX Across Fast-Growing ASEAN Markets

SPIDER+ is helping ASEAN construction teams turn daily site work into transparent, practical and scalable digital management.

BY
DANIEL DE BOMFORD AND CIAN O'NEILL

Across ASEAN, construction continues to accelerate, becoming larger and demanding proven quality. For SpiderPlus & Co.'s platform, SPIDER+, the answer is localization, building agile digital infrastructure that fits the way people already work. SPIDER+ has been developed through boots-on-the-ground work on-site in Japan, in collaboration with those who will actually use it, and through hands-on verification with local teams. It needs to be simple enough to use every day, but powerful enough to change how projects are managed.



The value becomes especially clear where traffic and infrastructure gaps make site visits difficult. For managers overseeing multiple projects and quality control teams, remote instruction and verification allow them to check conditions, issue directions and confirm corrections without always being physically present. For multi-skilled workers, who often move across trades, the same platform supports flexible, practical work rather than imposing a rigid system.



Paper-based workflows, handwritten reports, photos and records that rely on memory are still common on worksites and create risks and inefficiencies. SPIDER+ turns ordinary site actions into structured data. Drawings, photos, inspection notes and corrective records are kept on one platform, giving owners, contractors and consultants a shared view of progress and quality. Its analysis feature reduces rework, contributes to shortening construction periods, clarifies accountability and prepares data-driven improvements for subsequent construction phases.



Vietnam and the greater ASEAN market show how SpiderPlus & Co.'s approach is taking hold. Users cite easier photo management, faster report creation, clearer correction tracking and smoother information sharing among contractors, subcontractors and management. Its agility is proven in small and medium-sized projects, showing the system can adapt to everyday construction, not only flagship developments.

Already proven in the private sector, SpiderPlus & Co. is entering a new stage in the public sector. Discussions and pilot programs with ASEAN infrastructure authorities are exploring how digital construction management can support national standards. The company's role is evolving beyond that of a software provider to that of a partner that applies Japanese quality controls to local infrastructure management.

That leads to its longer-term vision: a shared data foundation and common language, linking public and private players across the industry. Its purpose is to make construction more transparent, accountable and efficient. Founder, President and CEO Kenji Ito's belief remains the guide: "If it isn't simple, it won't be used." In ASEAN, that simplicity may be what turns DX from an imported concept into a common language on the ground.



"If it isn't simple, it won't be used."

Kenji Ito
President and CEO, SpiderPlus & Co.

SPIDER+

<https://spider-plus.com>



Lib Work Reimagines Japan's Housing Future Through 3D Printing

Lib Work is transforming the housing sector with 3D printing and digital transformation in an era of shifting demand.

BY
DANIEL DE BOMFORD AND QUENTIN LANGE



Since Japan's construction boom in the 20th century, Japan has employed a "scrap-and-build" model, especially in housing. Economic and social incentives push people to tear down houses and rebuild from the ground up rather than reuse dwellings. Now, as demographic and economic pressures intensify amid a weak yen, reliance on imported materials and a shrinking construction workforce, Lib Work Co., Ltd. offers a new model: 3D printed houses made from natural materials.

President and CEO Chikara Seguchi said that Japan needs to move away from scrap and build houses that remain useful for longer and can be renewed rather than discarded. This is both a challenge and an opportunity for the sector. Seguchi believes that the sector should preserve what is valuable, introduce thoughtful adjustments that create new value and allow those buildings

to be reborn. Lib Work is pursuing digital transformation (DX) across the entire housing value chain, from the construction itself to customer acquisition and planning. As skilled construction workers age out of the industry, Seguchi sees traditional housing construction becoming akin to works of art, out of reach of average buyers and requiring the specialized skills of a limited number of professionals. "That is precisely why we believe new technologies are necessary," he said. "This includes 3D-printed housing, and it also includes digital transformation more broadly."

3D-printed housing offers clear advantages: lower labor requirements, increased efficiency and lower carbon emissions. Furthermore, "physical AI" is advancing to the point that the production of the house itself

can be automated. Because it is made from natural materials rather than concrete, the process is far less carbon-intensive, and when the time comes for the structure to be dismantled, the materials return to the earth. Lib Work is also digitalizing customer acquisition processes, and Seguchi cited the company's YouTube channel as evidence of shifting expectations. Rather than touring model homes, people looking to build are searching online. The company's YouTube presence serves as the entry point.



"We want to help reduce costs, raise productivity and create systems that make it possible to build efficiently."

Chikara Seguchi
President and CEO,
Lib Work Co., Ltd.



1. Mixing 3D printing materials



2. 3D printing process



3. A sample of the 3D printing material



4. Fire resistance test



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