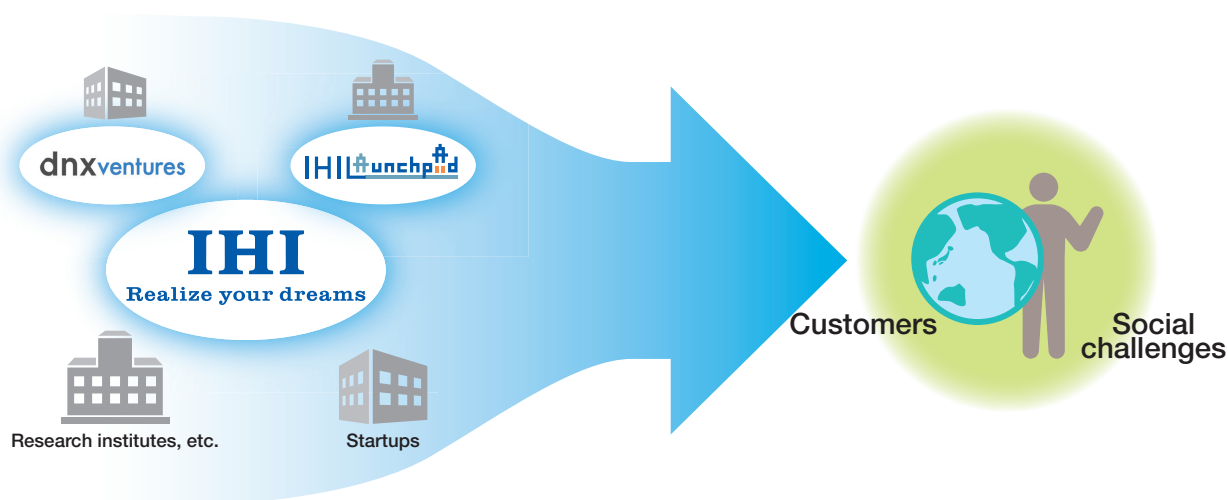


# Value Creation for Our Customers Based on Collaboration Work with Startup Companies

## Open innovation activities in Silicon Valley

The ability of the IHI Group by itself is not always enough to totally provide solutions to customers under the circumstances becoming increasingly complicated and uncertain. We have begun providing solutions in our new location in Silicon Valley opened for collaboration work with startups. Some results have already appeared through our collaboration activities.



The IHI Group's open innovation activities

Today, in an effort to build a sustainable society, we are expected to take measures for the environment (de-carbonization, low-carbonization, energy efficiency, etc.), infrastructure (disaster prevention, creating sustainable cities, etc.) and the declining working force which is caused by the decreasing birth rate especially in developed countries.

The changing social and business circumstances surrounding our customers have caused shifts of solutions in our customers, and have required new business models in addition to conventional approaches. Therefore, the IHI Group also needs to provide solutions more and more quickly by incorporating technological advances such as IoT to help our customers create new values.

## Open innovation in Silicon Valley

In an attempt to solve various social agendas and continuously provide values for our customers, the IHI Group is realizing that it is insufficient to rely on our internal resources alone for adapting to dynamic changes. Therefore, we have been pushing forward with our initiative in open innovation, whereby our strengths and a variety of external technologies and know-how are combined. This effort includes our partnership with a US venture capital firm Draper Nexus (current DNX), which has allowed us to utilize startups' technologies and know-how that help us quickly provide our customers with solutions that meet their needs.



Partner venture capital firm  
(The co-working space in their building houses multiple startups)

Draper Nexus has deep connection with prestigious venture capital firms in Silicon Valley, and is operated by experienced capitalists, which allows us to access to right startups. In addition, they have strong ties with Japanese companies. Its proven track record of working with startups makes them an ideal partner for the IHI Group in starting open innovation activities in Silicon Valley.

### Developing our depalletizing system

In one example of our open innovation activities, the IHI Group provided solutions for customers by combining our logistics system with the image recognition technology of Kinema Systems (current Boston Dynamics), a startup in Silicon Valley.

Since unloading (depalletizing) work in the logistics field involves heavy labor, it is more and more challenging to retain or secure employees. Therefore, there was an urgent requirement for automation and efficiency improvement in this field. While other types of work were being automated, depalletizing still remained as a human work to the last moment. This is because it is difficult to achieve instantly identifying various goods regardless of environmental changes. Automated depalletizing systems did exist before, but their application has been hampered by several challenges including pre-registering data such as the images of boxes and information about how the boxes are loaded, which was a time-consuming image recognition process. And it is also especially challenging when different types of boxes are loaded together. Therefore, some of our customers sometimes end up underutilizing the depalletizing system they have deployed.

As a solution to this problem, the IHI Group has developed the “IHI Depalletizing System,” utilizing the AI and three-dimensional vision technologies of Kinema Systems. Incorporating Kinema Systems’ AI-based image recognition technology, the IHI Depalletizing System helps spare our

customers the work for pre-registering image data. In addition, its significantly improved recognition ability achieves a 30% increase in efficiency. This collaborative solution was praised by our customers for its ability to handle multiple types of boxes loaded on one pallet.

### Continuously creating new services

As in the case of our depalletizing system, combining effectively startups’ state-of-the-art technologies and IHI’s system technologies allows us to develop businesses rapidly. The IHI Group’s proven track record of successful projects with startups has helped improve our presence in the field of open innovation in Silicon Valley. With the aim of further accelerating such efforts, we launched IHI Launch Pad in Silicon Valley.

IHI Launch Pad houses some of actual IHI products, and we have specific discussions and conduct targeted validation with startups. Here, we also hold workshops with startups to explore solutions to IHI’s problems. This facility greatly contributes to exploring business ideas and expediting our commercialization process.

The IHI Group has proposed open innovation solutions in collaboration with startups in order to meet the needs of society and our customers. We are becoming increasingly equipped to create new services and solutions.

In an effort to create new services through partnerships, the IHI Group has learned more than 1 000 startups’ information so far. In order to provide new values, we are continuously exploring opportunities for business partnerships including utilization of satellite data and AI-related technologies.

The IHI Group will strive as one in order to provide unique solutions for our customers as quickly as possible.

IHI Launch Pad



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