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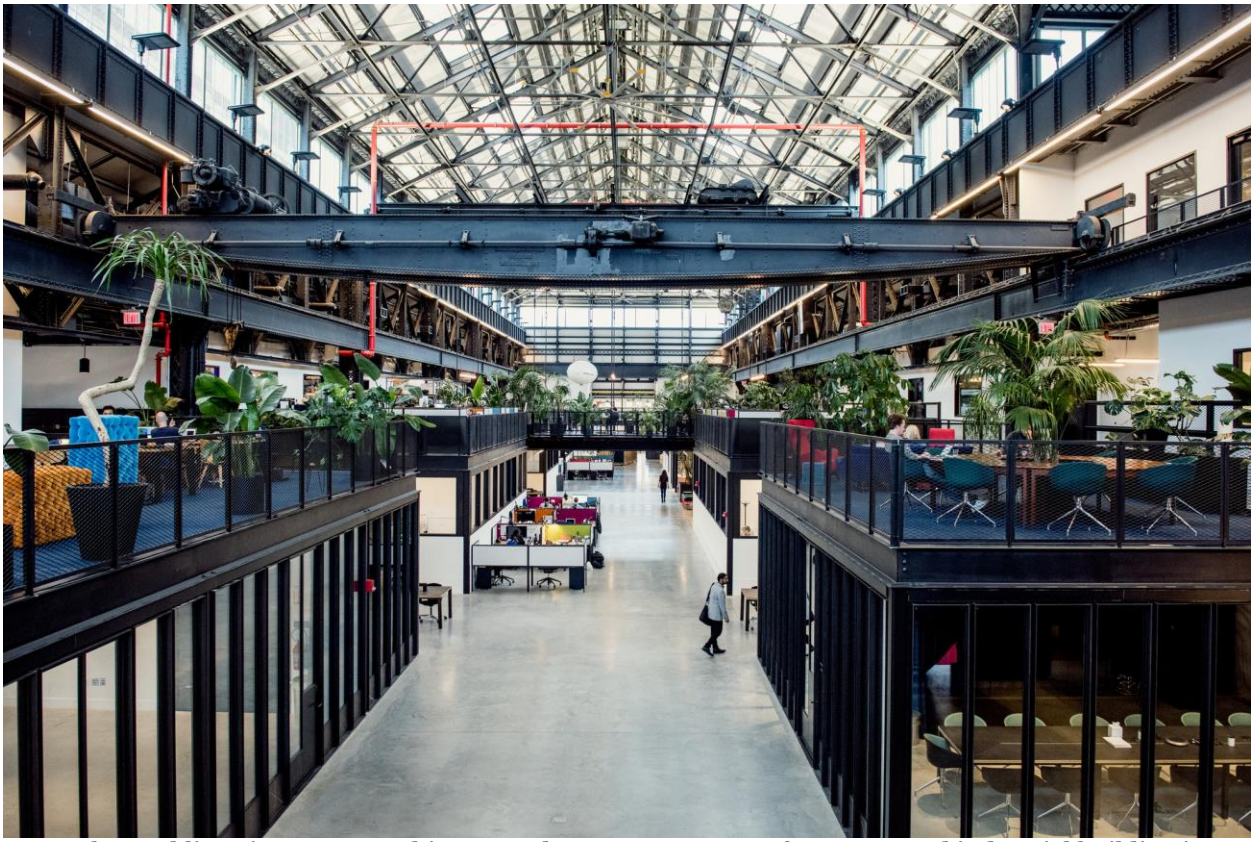
TECHNOLOGY

A Hardware Renaissance Grows in Brooklyn — and Elsewhere

By STEVE LOHRAPRIL 27, 2017



New Lab, a public-private partnership, opened an 84,000-square-foot renovated industrial building in Brooklyn that hosts 80 companies. CreditVincent Tullo for The New York Times

StrongArm Technologies, a start-up company in Brooklyn, makes “ergo-skeletons” that look a bit like futuristic versions of the back support belts that warehouse workers often wear.

Sensors embedded in the devices monitor a worker’s movements, and artificial intelligence software uses that information to suggest rest, stretching or posture changes — an automated safety coach for preventing back injuries.

StrongArm, a fledgling outfit with just 20 employees, is one of a new wave of start-ups making all sorts of devices that offer a glimpse of the future for the manufacturing of high-tech hardware in America’s cities.

The company's home in Brooklyn is a vast, renovated industrial building, where World War II battleships were once made. Now it is dedicated to commercializing digital-age hardware start-ups.

New Lab, a public-private partnership, opened the doors to the 84,000-square-foot space last June. It now hosts 80 companies across a range of industries and in various stages of development, but they typically have three to 20 employees.

StrongArm Technologies, a start-up in Brooklyn, makes "ergo-skeleton" back support belts.CreditVincent Tullo for The New York Times

On Thursday, New Lab announced that 14 of its companies, including StrongArm, are joining an urban technology initiative with the New York City Economic Development Corporation. The goal is to generate technology for urban challenges ranging from traffic congestion to local food cultivation.

"We want them to not only make technology in New York, but to deploy it in New York City," said Alicia Glen, New York's deputy mayor for economic development.

That you don't have to be a giant company to have a good hardware idea has been evident for years at Maker Faire events, where inventors showcase their homemade engineering projects. Last year, more than one million people attended Maker Faire events worldwide.

Enthusiastic amateurs can matter a lot in technology. Hobbyists led the personal computer revolution, before it morphed into a huge industry.

"The maker stuff is great, but the key to having a real impact will be entrepreneurial companies and ones that can scale up, generating revenue and jobs," said William Aulet, managing director of the Martin Trust Center for Entrepreneurship at the Massachusetts Institute of Technology.

But progress in hardware — the messy physical world — tends to take longer than in the digital-only realm of software. For a decade now, cloud computing and open-source software have drastically lowered the cost of starting a software company. So the number of software start-ups has surged.

Now, it seems, is the time for hardware, where a similar phenomenon is getting underway. It is helped by the software trend, but it is really driven by new hardware tools like 3-D printing and laser cutters as well as low-cost, open-source hardware that allows for rapid prototyping that accelerates the pace of development.

The hardware start-ups tend to be clustered in urban settings like San Francisco, Boston and New York. The Urban Manufacturing Alliance, a nonprofit community development organization created in 2011, now has about 550 members representing more than 150 cities.

There are signs that manufacturing employment in cities has stabilized, and is reviving in places. After steadily declining for three decades, the number of manufacturing jobs in New York increased by 3,000 from 2011 to 2015, to more than 78,000, the most recent figure available.

This nascent hardware resurgence is difficult to measure precisely. The start-ups are working in many industries, from manufacturing to health care, and research analysts typically classify them as entrants in those industries rather than hardware companies.

Farmshelf is a New Lab start-up that uses sensors and software to develop hardware units for locally grown food. CreditVincent Tullo for The New York Times

But there are signs of a groundswell of high-tech hardware start-ups, beyond breakout companies like the electric carmaker Tesla and Nest Labs, the digital thermostat company, which Google bought for $3.2 billion and is now a subsidiary of the parent company, Alphabet.

Funding is becoming more plentiful from traditional venture capitalists, the venture arms of major corporations and venture funds that are dedicated to hardware start-ups, like Bolt and Lemnos Labs. The companies in New Lab, for example, have raised more than $250 million.

For most companies in New Lab, the Brooklyn center is headquarters, and where their design and development are done. As the hardware start-ups grow, how much manufacturing will be done in the city is an open question.

StrongArm, for example, is starting to gain momentum, having sold more than 4,000 units of its digital safety wear in the last couple of years. Its manufacturing is done by contractors, one in an industrial district elsewhere in New York City and another in upstate New York.

New Lab offers hardware makers free or low-cost access to 3-D printers, laser cutters and other manufacturing equipment. That has been a lure for companies like StrongArm.

David Belt, the chief executive of New Lab. CreditVincent Tullo for The New York Times

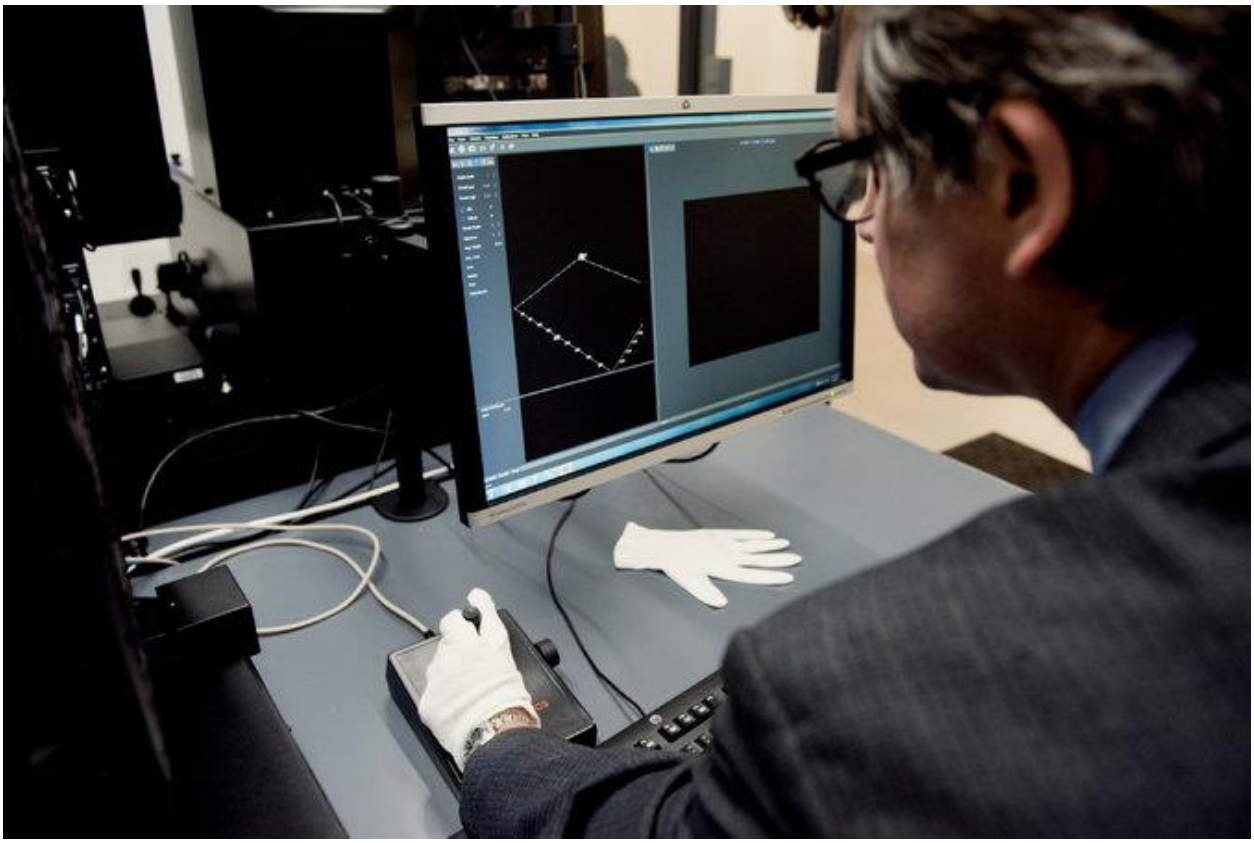
“What we do requires a ton of equipment, and that’s what got us in the door,” said Sean Petterson, the company’s 26-year-old co-founder and chief executive.

A handful of corporate partners, including General Electric, Intel, JetBlue, Hewlett Packard Enterprise and Autodesk, have signed up to work with the New Lab start-ups in various ways.

The cities of Copenhagen and Barcelona, Spain, also plan joint innovation programs with the Brooklyn hardware center. And New Lab says it is setting up a fund, New Lab Ventures, to invest in its companies, with a goal of raising $50 million.

Beth Comstock, vice chairwoman of G.E., who is in charge of new business development, has visited New Lab several times. Ms. Comstock even did a video interview with Andrew Shearer, chief executive of Farmshelf, a New Lab start-up that is using sensors and software to develop hardware units for locally grown food.

“We need to be constantly learning, connecting with new companies coming up, and seeing new business models earlier,” Ms. Comstock said.



Matthew Putman, the chief executive of Nanotronics Imaging, which uses artificial intelligence and robotics to analyze and detect flaws in high-tech manufacturing. CreditVincent Tullo for The New York Times

New Lab itself began as a test-and-learn start-up. In 2013, it created a “beta” space nearby in the Brooklyn Navy Yard in a building with 8,000 square feet. “It wasn’t obvious that companies would want to come here,” said David Belt, chief executive of New Lab.

But come they did. New Lab has fielded more than 400 applications to select its 80 companies. An idea and enthusiasm are not enough to make the grade. Companies, Mr. Belt explained, must have a product and usually a seed round of funding.

Mr. Belt and his partner at New Lab, Scott Cohen, also recruited companies they thought could contribute a lot to their hardware community and mentor younger outfits.

Nanotronics Imaging was one of them. The company, founded in 2010, grew out of the research of Matthew Putman, then a scientist at Columbia University. Its automated microscopes employ artificial intelligence and robotics to analyze and detect flaws in high-tech manufacturing for semiconductor, aerospace and other industries.

Nanotronics has raised more money than any other New Lab company, $41 million, and its investors include Peter Thiel's Founders Fund and Gordon Moore, a co-founder of Intel. Nanotronics started in Ohio, and it still has an office there, but its headquarters are now in Brooklyn, where it does its design work and employs 20 of its 60 employees. It operates a factory in Hollister, Calif.

In addition to the 3-D printers and other prototyping equipment at New Lab, Justin Stanwix, chief revenue officer at Nanotronics, said a vital asset of the Brooklyn work space was the connections and idea-swapping to improve manufacturing, tap investors and manage intellectual property.

"That really helps mitigate the risks for these start-up companies," Mr. Stanwix said.

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