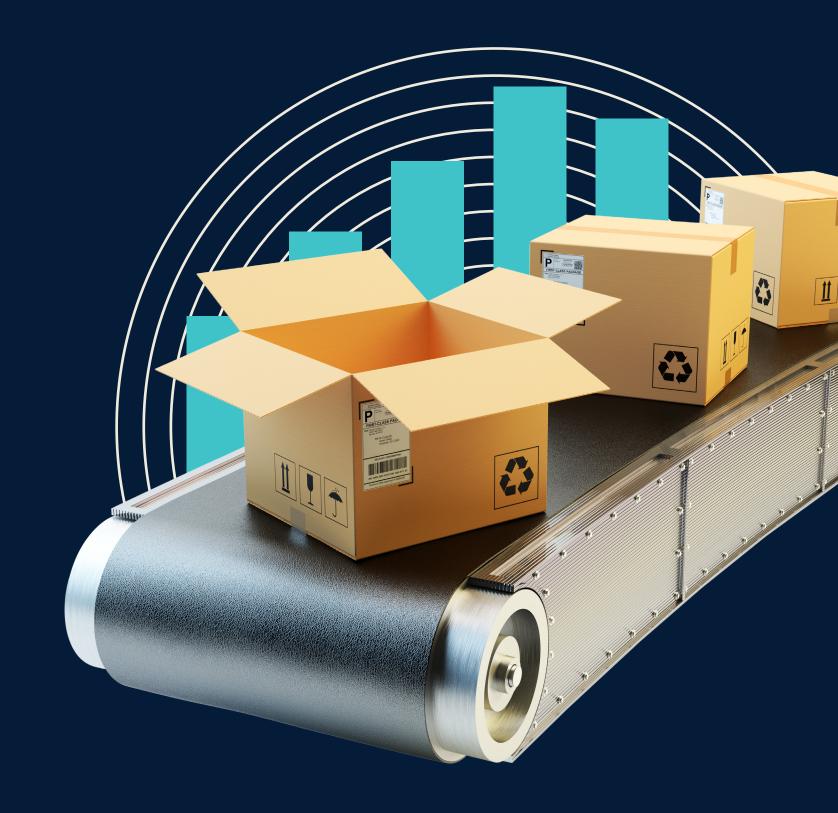
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EMERGING TECH RESEARCH

Supply Chain Tech

VC trends and emerging opportunities







Contents

Vertical overview	3
Q1 2022 timeline	5
Supply chain tech landscape	6
Supply chain tech VC ecosystem market map	7
VC activity	8
Emerging opportunities	14
Supply chain tech and last-mile delivery for the developing world	15
Warehousing tech	17
Select company highlights	18
Flexport	19
ElasticRun	20
Exotec	21

Institutional Research Group

Analysis



Jonathan Geurkink Analyst, Emerging Technology jonathan.geurkink@pitchbook.com pbinstitutionalresearch@pitchbook.com

Data

Matthew Nacionales Data Analyst matthew.nacionales@pitchbook.com

Publishing

Report and cover designed by **Drew Sanders**

Isometric landscape designed by Chloe Ladwig

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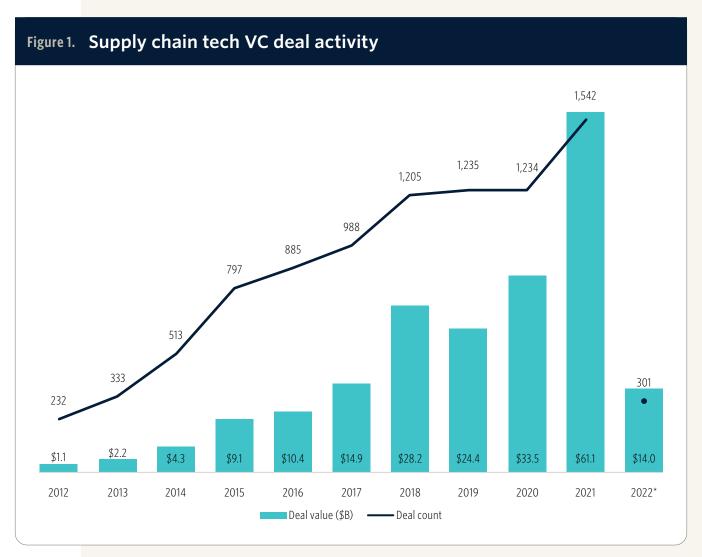


This report serves as a quarterly snapshot of the Supply Chain tech vertical in Q1 2022. <u>Click here</u> to view the Q4 2021 edition.



Vertical overview

In the early 1960s, MIT Sloan School of Management professor Jay Forrester invented the Beer Game. No, it didn't involve a pingpong table in a fraternity basement; it was based in systems thinking and sought to illuminate the nonlinear nature of industrial and economic dynamics. The game, which was popularized in Peter Senge's classic The Fifth Discipline, and which the entering Sloan School class is subjected to every year, simulates a simplified four-node supply chain including a brewery, a distributor, a supplier, and a retailer for each team. The game runs 50 rounds, representing weeks, and in each round the retailer draws a random number representing customer demand. Each node, or team member, writes down expected weekly demand on a slip of paper, which is then passed along the supply chain with chips representing cases of beer moving in the opposite direction. To win, a team must run its supply chain as efficiently as possible: Nodes are charged 50 cents per case of accumulated inventory per week, and unfilled backorders are penalized \$1 per case per week. Other than through order slips, team members cannot communicate directly. Seems simple, but it's not. The four-"week" delay as customer orders make their way up the chain to brewery production can wreak havoc upon the system. In fact, it's a bit like the Kobayashi Maru— MIT professors report that even teams that perform relatively well end up feeling frustrated and out of control. CEOs of Fortune 50 companies apparently do no better than high school students. Team members frequently resort to blaming each other for erratic performance. A slight variance in demand can create a bullwhip effect as order and inventory swings are amplified up and down the chain. Even with "perfect information," teams still often perform poorly.



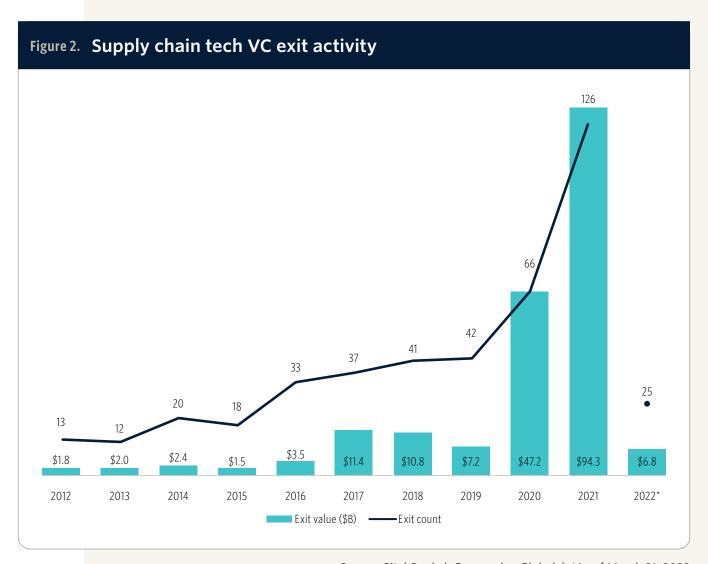
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Q1 2022 Supply Chain Tech Report



VERTICAL OVERVIEW

Simple rules, yet complex outcomes. Now add price fluctuations, hoarding, mis- and disinformation, product returns, inflation, reshoring, port congestion, trucker strikes, pandemics, and war. This is the current state of complexity supply chain tech seeks to tame, while simultaneously chasing Amazon and the asymptote of instantaneous delivery. The turmoil of the past couple of years has exposed the fragility of global supply chains that have been built up in recent decades. Just-in-time inventory systems across supply chains provided dramatic cost reductions but have often proven brittle in the face of the global volatility in demand of the past two years. Sensing the opportunity, investors and startups answered with a dramatic spike in deal volume in the supply chain tech vertical in the second quarter of 2020 and significantly larger investment flows in 2021. Q1 2022 deal volume slowed but still yielded some sizable later-stage deals into companies such as Flexport, Bolt, Relex, and ElasticRun. Reworking and reshoring supply chains to make them more supple and resilient while still cost-efficient could be a decade(s)-long opportunity as global trade flows adjust to new realities. System dynamics, predictive analytics, real-time data integration, and artificial intelligence (AI) offer roadmaps to the issues outlined above. Meanwhile, relentless competition in e-commerce to deliver products to consumers in ever shorter timeframes is likely to spur investment and technology development across the vertical. We also see significant opportunities through bringing developed world supply chain tech to the developing world, or the Fortune at the Bottom of the Pyramid, as described by C. K. Prahalad in his famous book of the same name.

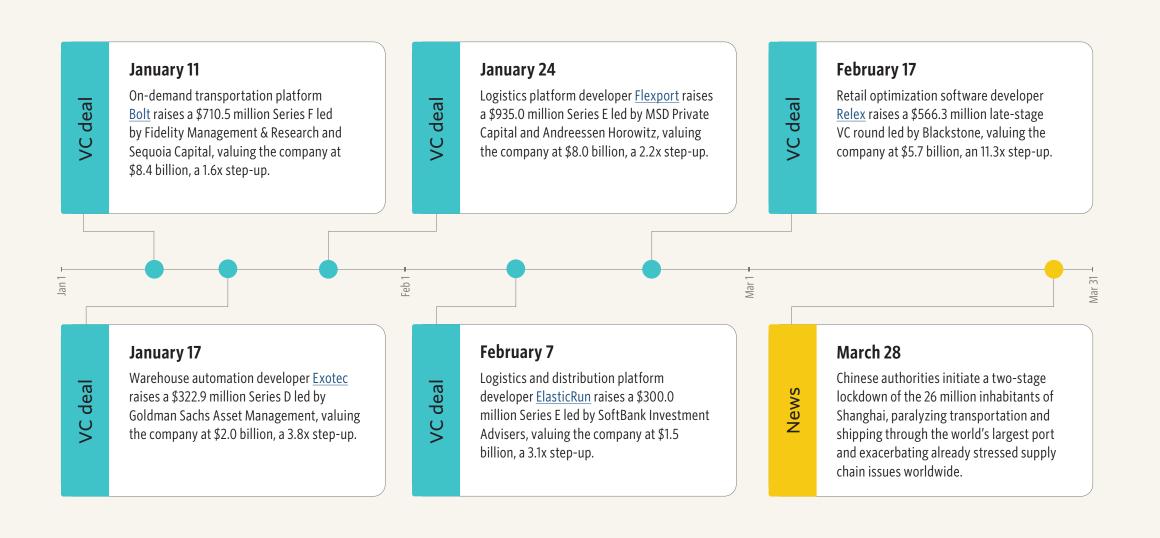


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Q1 2022 timeline









Supply chain tech landscape

- 1 Enterprise supply chain management
- 2 Warehouse tech
- 3 Freight tech
- 4 Last-mile delivery



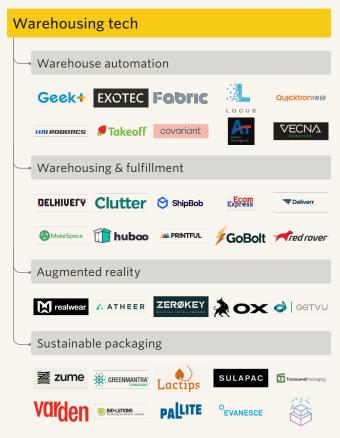


Supply chain tech VC ecosystem market map

Click to view the interactive market map on the PitchBook Platform.

Market map is a representative overview of venture-backed or growth-stage providers in each segment. Companies listed have received venture capital or other notable private investments.







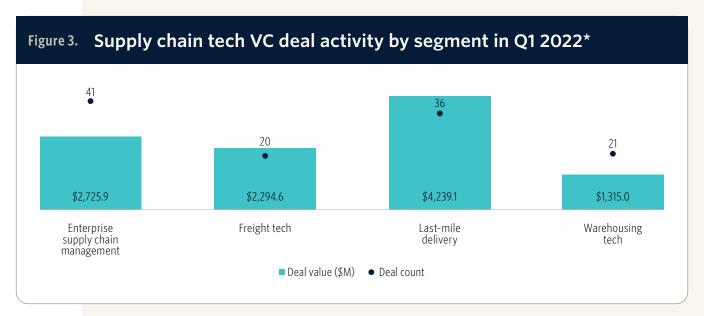




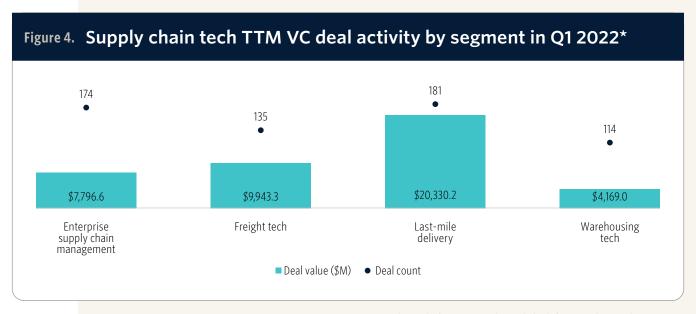
VC activity

Venture capital (VC) investment into supply chain tech slowed in Q1 2022 from 2021's record pace. Startups raised \$14.0 billion in the quarter across 301 deals. The total value of deals declined 3.6% QoQ and 20.4% YoY, while the number of deals was down 12.2% and 26.6%, respectively. During the quarter, last-mile delivery and enterprise supply chain management segments saw the largest number of deals and investment flows. Notable deals in the quarter included \$935.0 million for Flexport, which lifted its post-money valuation to \$8.0 billion. Estonia-based Bolt raised \$710.5 million. The later-stage deal yielded a post-money valuation of \$8.4 billion and provides significant capital for the company's pursuit of Uber across verticals in the ridehailing and last-mile delivery segments. In February, Finland's Relex raised \$566.3 million in a deal led by Blackstone. The deal represented a significant step-up of 11.3x and resulted in a post-money valuation of \$5.7 billion. Warehousing automation and robotics firm Exotec completed a Series D for \$322.9 million led by Goldman Sachs Asset Management. The deal represented a 3.8x step-up and resulted in a post-money valuation of \$2.0 billion for the France-based startup.

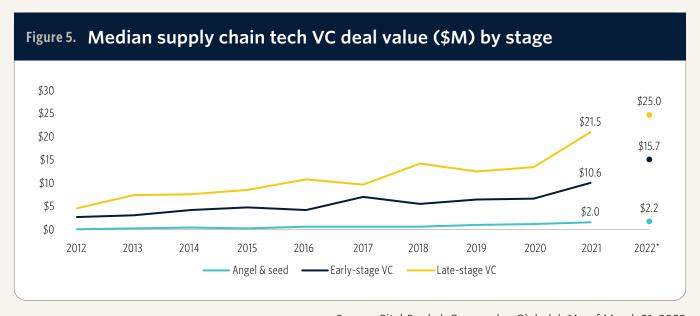
Pre-money valuations in Q1 for the segment overall were up significantly compared with 2021—more than 120%. Most of the increase in valuations came from early-stage deals with angel & seed deals rising modestly and median valuation for late-stage deals declining slightly. Overall exits in the quarter declined 28.6% to 25 versus Q4 2021 but were up 31.5% from Q1 2021. At more than 75%, acquisitions dominated the number of exits, with just four public listings in the quarter—well off last year's pace.



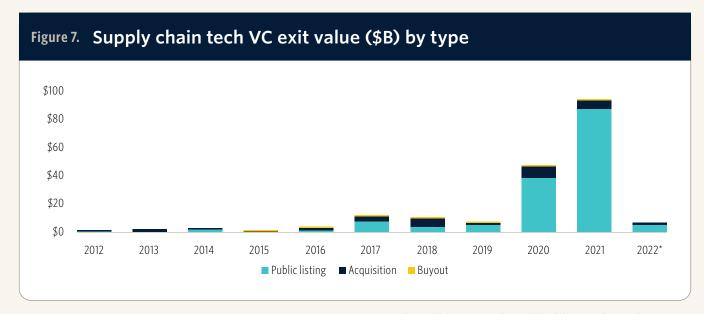
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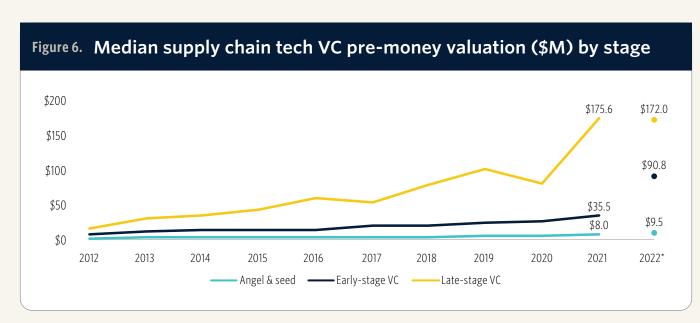




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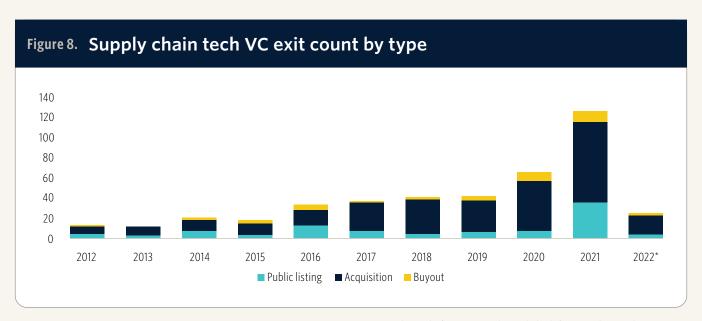




Figure 9. Key supply chain tech VC deals*

Company	Close date	Category	Stage	Deal size (\$M)	Post-money valuation (\$M)	Lead investor(s)
Flexport	January 24, 2022	Marine, rail & port logistics	Series E	\$935.0	\$8,001.3	Andreessen Horowitz, MSD Private Capital
Getir	March 17, 2022	Ultrafast delivery	Series E	\$768.0	\$11,800.0	Mubadala Investment Company
Bolt	January 11, 2022	Ultrafast delivery	Series F	\$710.5	\$8,371.8	Fidelity Management & Research, Sequoia Capital
Swiggy	January 24, 2022	Delivery services	Series K	\$700.0	\$10,700.0	Invesco
Relex	February 17, 2022	ERP & inventory management	Late-stage VC	\$566.3	\$5,663.1	Blackstone
Qonto	January 10, 2022	Procurement & sourcing	Series D	\$549.8	\$4,977.6	TCV, Tiger Global Management
Assent Compliance	December 31, 2021	ERP & inventory management	Series D	\$350.0	\$0.0	Vista Equity Partners
Weee!	February 18, 2022	Delivery services	Series E	\$425.0	\$4,100.0	SoftBank Investment Advisers
Project44	January 11, 2022	Trucking logistics	Series F	\$420.0	\$2,620.0	Goldman Sachs Asset Management, TPG, Thoma Bravo
Plenty	January 25, 2022	N/A	Series E	\$400.0	\$1,425.0	JS Capital Management, One Madison



Figure 10. Key supply chain tech VC exits*

Company	Close date (2022)	Category	Exit size (\$M)	Exit type	Acquirer(s)/index
QuikReturn	March 16	Reverse logistics	N/A	Acquisition	Veho
<u>TraktorHub</u>	March 3	N/A	N/A	Acquisition	Quipster
<u>Synfioo</u>	March 3	N/A	N/A	Acquisition	Project44
<u>Plant Response</u>	February 25	N/A	N/A	Acquisition	The Mosaic
<u>Syft</u>	February 24	ERP & inventory management	N/A	Buyout	Global Healthcare Exchange, Golub Capital BDC, Temasek Holdings, Warburg Pincus
MakeSpace	February 18	Warehousing & fulfillment	N/A	Acquisition	Clutter
<u>Huitongda</u>	February 17	ERP & inventory management	\$2,562.7	Public listing	China Heilan Group, Greenwoods Asset Management, SenseTime, Skyworth Group, Suzhou Gold Mantis Construction Decoration Company
Nexxiot	February 16	Asset tracking & management	N/A	Acquisition	Arvato Financial Solutions
Fr8app	February 15	Trucking logistics	N/A	Acquisition	Hudson Capital (Beijing)
<u>Equilibrium</u>	February 14	N/A	N/A	Acquisition	Boticário Group



Figure 11. Top strategic acquirers of supply chain tech companies since 2012

Investor	Deal count*	Investor type
<u>Delivery Hero</u>	32	Corporation
<u>Foodpanda</u>	26	Corporation
Just Eat Holding	18	Corporation
Grubhub	11	Corporation
Just Eat Takeaway.com	8	Corporation
<u>Zomato</u>	7	Corporation
iFood	7	PE-backed company
Glovo	6	VC-backed company

Source: PitchBook | Geography: Global | *As of March 31, 2022

Figure 12. Top VC investors in supply chain tech companies since 2012

Investor	Deal count*	Primary investor type
SOSV	151	VC
500 Global	91	VC
CPT Capital	65	VC
Blue Horizon Corporation	61	VC
S2G Ventures	60	VC
Unovis Asset Management	58	VC
FJ Labs	54	VC
Global Founders Capital	50	VC
Alumni Ventures	50	VC
Siddhi Capital	47	VC



Figure 13. Top VC-backed supply chain tech companies by total VC raised to date

Company	Category	VC (\$M) raised to date*	Sector	Location
<u>Ele.me</u>	Delivery services	\$7,335.5	Information technology	China
<u>Waymo</u>	Autonomous trucks & middle-mile	\$5,500.0	Consumer products and services	US
Xingsheng Selected	Delivery services	\$5,440.0	Consumer products and services	China
Gopuff	Ultrafast delivery	\$4,934.7	Consumer products and services	US
<u>Swiggy</u>	Delivery services	\$3,550.8	Consumer products and services	India
<u>Instacart</u>	Delivery services	\$2,734.8	Consumer products and services	US
<u>Lalamove</u>	Delivery services	\$2,476.5	Business products and services	China
Flexport	Marine, rail & port logistics	\$2,246.9	Information technology	US
Suning Finance	Supply chain finance & payments	\$2,211.8	Information technology	China
Nuro	Autonomous delivery	\$2,132.0	Business products and services	US



Emerging opportunities

Supply chain tech and last-mile delivery for the developing world

Supply chain technology unlocks opportunity in developing world.

Warehousing tech

A new cohort of startups is setting the stage for warehouse automation 2.0.



Supply chain tech and last-mile delivery for the developing world

Overview

Several startups are applying supply chain technology to logistics and fulfillment challenges in developing countries. In French-speaking Africa, startup Chari has developed and deployed an e-commerce app and fulfillment infrastructure to help small retailers. Across Morocco, there are roughly 200,000 convenience stores generating some \$10 billion in aggregate revenue—a highly fragmented market. Chari's co-founders, Sophia Alj, a former strategy consultant at McKinsey Company, and Ismael Belkhayat, a former strategy consultant at Boston Consulting Group, developed the app to provide these small retailers with a means to easily order competitively priced fast-moving consumer goods (FMCG) with free 24-hour delivery. With further funding, they have acquired and developed a credit system for the retailers and their customers to facilitate commerce and generate important credit data streams. Morocco is notoriously underbanked; roughly 70% of the population are either unbanked or underbanked, with little access to credit. Chari's solution could potentially unlock significant value across this important channel in Morocco. The company is expanding into Tunisia as well.

In India, a somewhat similar opportunity exists but on a scale more than an order of magnitude larger. Across the rural regions are more than 10 million Kirana (small, local stores) that have historically been underserviced as a result of low order size and long distances from distributors. Rural owners frequently spend several days each month in urban areas to get inventory for their

stores. <u>ElasticRun</u> founder and CEO, Sandeep Deshmukh, who was previously an early employee at Amazon India and, prior to that, helped build cloud applications at Apple for five years, saw an opportunity where there was no fulfillment ecosystem in India for this segment. The <u>ElasticRun</u> platform, which has coverage across 26 states, 80,000 villages, and works with more than 400 brands, utilizes AI engines for supply aggregation, crowdsourced logistics, and machine learning engines to generate demand predictions at the local store level. Similar to <u>Chari</u>, the platform folds in credit solutions to enable banking institutions to extend services to rural customers and merchants. The granular consumption data generated by the platform helps large global FMCG brands hone and target their marketing. The company believes it has the potential to unlock \$600 billion in Indian rural consumption across FMCG, finance, food, general merchandise, and pharma.

Also in India, but focused on a somewhat more narrowly defined opportunity, is <u>ReshaMandi</u>. The company has developed a digital ecosystem for the natural fiber supply chain from farm to retail. India is the second-largest producer and number-one consumer of silk in the world. In 2017, the Indian sericulture market was estimated at \$26.6 billion and is expected to grow at an 18% CAGR to more than \$72 billion in 2023.⁴ At the farming level, the company provides Internet of Things (IoT) tools such as soil monitoring sensors in mulberry fields, air quality, and temperature sensors for silkworm rearing sheds. Tied in to farmers' smartphones, the sensors allow <u>ReshaMandi</u> to monitor conditions and provide text and voice support to help farmers optimize yields. The platform provides farmers real-time pricing for silk cocoons, as well as scheduling to sell to

4: "The Sericulture Market in India to 2023 - Continuous Increase in Disposable Incomes Is a Major Driver," *GlobeNewswire*, Research and Markets, November 14, 2018.

^{1: &}quot;Morocco GAIN Report," USDA Foreign Agricultural Service, FAS/Morocco, May 31, 2019.

^{2: &}quot;About," Chari, n.d.

^{3: &}quot;Morocco Has Highest Population Without Access to Banking Institutions," Morocco World News, Toms Dumpis, April 27, 2021



SUPPLY CHAIN TECH AND LAST-MILE DELIVERY FOR THE DEVELOPING WORLD

markets or ReshaMandi's warehouses. Previously, farmers could spend days carrying bundles of silk cocoons to market, with no idea of the pricing they would receive from intermediaries. ReshaMandi hopes its tools will dramatically improve quality and yield for farmers, thereby allowing them to enjoy better pricing while also streamlining the somewhat murky intermediaries market. As a buyer, warehouser, and weaver itself, the company seeks to benefit from better quality and cost throughout the supply chain. In April 2022, the company set up the second-largest silk cocoon warehouse in Asia, benefiting more than 30,000 farmers and 6,000 silk reelers. In March, its affiliate ReshaWeaves opened its first retail store in New Delhi. The company is looking to expand its digital ecosystem into other natural fibers such as cotton and hemp.

Key parts of the strategy for unlocking opportunity in the developing world entail digital platforms with mobile or smartphone endpoints for the rural retailer or producer. Providing credit where there was little or none facilitates commerce along the supply chain, however, longer-term issues concerning collections and defaults and the platform's ability to manage creditworthiness remain somewhat uncertain. Challenges also abound with physical fulfillment and stocking down to the rural micro level through seasonal swings and across variable transportation infrastructure. Despite these challenges, the potential of these digital platforms and ecosystems to enhance quality, provide greater consumer options, and iron out inefficiencies looks promising.

Q1 2022 Supply Chain Tech Report



Warehousing tech

Overview

Amazon's purchase of warehouse robotics pioneer <u>Kiva Systems</u> one decade ago marked a sea change in warehouse automation. The \$775.0 million deal for <u>Kiva</u> generated billions of dollars in savings from operations for the e-commerce giant and allowed it to reduce click-to-ship cycle time by a factor of five. The key milestone for competitors and startups, however, came in 2015 when <u>Amazon</u> decided to keep the technology to itself—and even went so far as to suggest other retailers let the newly christened <u>Amazon Robotics</u> and Amazon Services fulfill their orders from <u>Amazon</u> warehouses, as discussed in a previous <u>PitchBook article</u>.

Some, such as the founders of France-based Exotec, saw the move as an opportunity to arm Amazon's competitors, and took up the challenge. Whereas Kiva's robots zipped around the warehouse floor essentially in two dimensions, Exotec developed its system of robots to move in three. The company's Skypod system's robots can reach 36-feet high, enabling high-density warehouse storage. Exotec claims its systems increase warehouse throughput fivefold and reduce response times to two minutes. Importantly, its modular system of racks and robots can be deployed within months and expanded without interrupting production. Founded in 2015, in Q1 2022, the company raised a \$322.9 million Series D led by Goldman Sachs Asset Management. Dell Technologies Capital was among the other investors in the round.

Other startups have taken up the challenge of re-engineering the warehouse. In February 2022, Phantom Auto raised \$42.0 million in an early-stage round. The company is developing and deploying remotely operated uncrewed and autonomous forklifts, which can be monitored and guided from anywhere, thus increasing safety, reducing labor costs, and boosting productivity. At the end of Q1, the company won the 2022 MHI Innovation Award for Best New Product.⁵ In March, Kargo raised \$27.9 million in an early-stage round that represented a 9.3x step-up. The company's smart loading dock solution uses IoT sensors and computer vision to verify and quality control inbound and outbound freight. Kargo's dashboard provides a view into the platform and aggregates enterprise resource planning data with the company's sensor towers at the loading dock to provide visibility and flag exceptions in real time. Sold as a service, Kargo installs and maintains the towers and integrates with existing systems with no upfront costs. In February, Arkansas-based Ox raised \$2.4 million in an early-stage round. Founded by Georgia Institute of Technology graduate and researcher Charu Thomas, the company is developing an augmented reality platform to manage picking and fulfillment on the retail and warehouse floors. The hands-free workforce automation solution powered by a pick-routing optimization platform enhances accuracy and efficiency with low capital intensity, promising a dramatic return on investment.

Relentless competition to match <u>Amazon</u>'s challenge to retail and e-commerce has generated a wave of investment and startups in warehousing automation. Looking further, as companies rethink existing supply chains to reduce dependence on cross-Pacific trade in light of the challenges of the past few years, warehouse automation technology offers a means to reduce cycle time, enhance efficiency, and boost labor productivity.

5: Note: MHI is the largest materials handling and supply chain trade association.



Select company highlights



SELECT COMPANY HIGHLIGHTS



Founded **2013**

3,000+ employees

Total raised: \$2.3B

Last financing: Raised \$935.0M

Last financing valuation: \$8.0B

Lead investors: MSD Private Capital, Andreessen Horowitz

Overview

Flexport's platform connects all nodes of the supply chain, thus allowing customers to track freight over sea, air, and land. The platform generates data on inventory impacts, transit time, landed costs, container utilization, and exceptions, and allows real-time collaboration across the supply chain. Shipment details and transportation milestones are available in one place. It provides metrics and market data to speed real-time decision making. Its multi-modal booking system provides a unified view to optimize supply chain decision making. The company's \$935.0 million Series E in January, led by MSD Private Capital and Andreessen Horowitz, marked the largest deal

in Q1 2022 across the supply chain tech vertical. The post-money valuation for the startup was \$8.0 billion.

In addition to funding development and expansion, <u>Flexport</u> has used capital raised in this and previous rounds to invest in a large number—42 at time of writing—of startups. Investments, at least on a deal volume basis, have been primarily in early-stage and seed round deals. Notable recent investments include <u>SILQ</u>, which provides factory floor data to enhance quality and anticipate bottlenecks; <u>Anvyl</u>, a developer of a relationship management platform for the supply chain; and Coast, a business products & services payment platform for fleet payments.



SELECT COMPANY HIGHLIGHTS



Founded **2016**

1,067+ employees

Total raised: \$433.5M

Last financing: Raised \$300.0M **Last financing valuation:** \$1.5B

Lead investors: SoftBank Investment Advisers

Overview

<u>ElasticRun</u> has taken on the challenge of developing a business products & services e-commerce platform for rural India. Through the <u>ElasticRun</u> platform, the company provides direct reach for brands to rural consumers through more than 10 million small village stores. The approach mirrors many of the tenets laid out in former University of Michigan professor and management strategist C. K. Prahalad's classic book, The Fortune at the Bottom of the Pyramid. Overwhelmed by logistics challenges and concluding that the spending power of this segment was insufficient to warrant significant investment, global brands have long ignored rural customers in developing economies. In doing so, they also forgo valuable information and trends among billions of potential consumers.

<u>ElasticRun</u>'s platform seeks to unlock about \$600 billion in rural Indian consumption by providing a digital channel for FMCG, food, general merchandise, pharma, and finance, while also generating valuable data and predictive analytics concerning rural consumption patterns and tastes across the country.

In February 2022, the startup raised \$300.0 million in a Series E led by SoftBank Investment Advisers. Goldman Sachs also participated in the round. This round represented a 3.1x step-up and provides funds to accelerate development of the platform, which already spans 26 states, 80,000 villages, and more than 400 brands.



SELECT COMPANY HIGHLIGHTS



Founded **2015**

350+ employees

Total raised: \$435.6M

Last financing: Raised \$322.9M **Last financing valuation:** \$2.9B

Lead investors:Goldman Sachs Growth
Equity

Overview

News that <u>Amazon</u> planned to keep its revolutionary Kiva robotic warehouse automation technology in house inspired <u>Exotec</u> founders Romain Moulin and Renaud Heitz to develop a better fleet of warehouse robots that could scale in three dimensions. In the six years since, the company has grown to 300 employees and expects to double that number by year's end. <u>Exotec</u>'s Skypod system, which involves a modular system of racks and robots that can scale 36 feet, increases storage density fivefold over traditional shelf-picking approaches. So far, the company has deployed the

Skypod system across 10 countries, with over 3,000 robots and customers including <u>Carrefour</u>, <u>Gap</u>, and Uniglo. Its €105.0 million revenue in 2021 more than doubled that of 2020.

In January 2022, the company raised a \$322.9 million Series D led by Goldman Sachs Asset Management. The company expects to use the funds for large-scale deployments across North America, Europe, and Asia, as well as significantly boost its research & development staff. The round represents a 3.8x step-up and resulted in a post-money valuation of \$2.0 billion for the company.

About PitchBook Emerging Tech Research

Independent, objective and timely market intel

As the private markets continue to grow in complexity and competition, it's essential for investors to understand the industries, sectors and companies driving the asset class.

Our Emerging Tech Research provides detailed analysis of nascent tech sectors so you can better navigate the changing markets you operate in—and pursue new opportunities with confidence.

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PitchBook Data, Inc.

John Gabbert Founder, CEO

Nizar Tarhuni Senior Director, Institutional Research & Editorial

Paul Condra Head of Emerging Technology Research

Additional research

Agtech

Alex Frederick alex.frederick@pitchbook.com

Artificial Intelligence & Machine Learning Brendan Burke brendan.burke@pitchbook.com

Fintech
Robert Le
robert.le@pitchbook.com

Foodtech Alex Frederick alex.frederick@pitchbook.com

Information Security
Brendan Burke
brendan.burke@pitchbook.com

Insurtech Robert Le robert.le@pitchbook.com

Internet of Things (IoT)
Brendan Burke
brendan.burke@pitchbook.com

Mobility Tech Jonathan Geurkink jonathan.geurkink@pitchbook.com

Supply Chain Jonathan Geurkink jonathan.geurkink@pitchbook.com

Emerging Spaces and Vertical Snapshots Ryan Vaswani ryan.vaswani@pitchbook.com