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An E.V. Start-Up Backed by UPS Does Away With the Assembly Line

Arrival, a developer of electric vans and buses, says it has come up with a cheaper way to build vehicles in small factories

By Neal E. Boudette

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A small electric vehicle company backed by UPS wants to replace the assembly lines automakers have used for more than a century — small factories employing a few hundred workers.

The company, Arrival, is creating highly automated “microfactories” where its delivery vans and buses will be assembled by multitasking robots, breaking from the approach pioneered by Henry Ford and used by most of the world’s automakers. The plants would produce tens of thousands of vehicles a year. That’s far fewer than traditional auto plants, which require 2,000 or more workers and typically produce hundreds of thousands of vehicles a year.

The advantage, according to Arrival, is that its microfactories will cost about \$50 million rather than the \$1 billion or more required to build a traditional factory. The company, which is based in London and is setting up factories in England and the United States, says this method should yield vans that cost a lot less than other electric models and even today’s standard, diesel-powered vehicles.

“The assembly line approach is very capital-intensive, and you have to get to very high production levels to make any margin,” said Avinash Rugoobur, Arrival’s president and a former General Motors executive. “The microfactory allows us to build vehicles profitably at really any volume.”

The company hopes its electric vehicles will disrupt the normally sleepy market for delivery vans. Such vehicles are well suited to electrification because they travel a set number of miles a day and can be charged overnight. Arrival has already won over UPS, which has a less than 1 percent stake in the company and plans to buy 10,000 Arrival vans over the next several years.

In Arrival’s factories, a motorized platform will carry unfinished vehicles among six different robot clusters, with different components added at each stop. The company is also replacing most steel parts used in vehicles with components made from advanced composites, a mix of polypropylene, a polymer used to make plastics, and fiberglass. These parts are to be held together by structural adhesives instead of metal welds.

The use of composites, which can be produced in any color, would eliminate three of the most expensive parts of an auto plant — the paint shop, the giant presses that stamp out fenders and other parts, and the robots that weld metal parts into larger underbody components. Each typically costs several hundred million dollars.

Arrival, which in March began trading on the Nasdaq exchange, hopes to start producing buses by the end of this year, but its ideas remain unproven. Automating auto plants is notoriously tricky. Tesla blamed overreliance on robots for the troubled start of its Model 3 production line in 2018.



Workers at Arrival's research and development center in Banbury, England. Andrew Testa for The New York Times

Manufacturing robots are usually programmed to do one or two tasks. Arrival is counting on its robots to handle a variety of jobs.

“For high-volume applications, this doesn’t seem workable,” said Kristin Diczek, senior vice president of research at the Center for Automotive Research in Ann Arbor, Mich. “Automation is great for things that are repetitious and precise. But if they are talking about very low volume, it could be viable.”

UPS has been working with Arrival almost since the start-up's founding, said Luke Wake, vice president of maintenance of the UPS automotive group.

The shipping giant has helped design a delivery van that affords greater visibility for drivers than a traditional truck he had monitored. Arrival's progress closely, visiting the company two or three times a month on average.

While he acknowledged that Arrival's untried approach to producing trucks posed a risk, he said it could accelerate the company's growth.

"Things can change rapidly when all the foundations are in place," he said. "We have invested in Arrival and have worked to make it a success."

At the same time, UPS is hedging its bets. It also works with and plans to buy vehicles from other electric automaker manufacturers.

"This is about getting the best, optimal delivery vehicle for us," Mr. Wake said.

Globally, UPS operates a fleet of about 120,000 vehicles, and around 13,000 of them use alternatives to diesel engines such as batteries.

In addition to UPS, BlackRock and the South Korean automakers Hyundai and Kia have invested in Arrival.

Electric vehicle companies have attracted frenzied interest from investors, who hope to find the next Tesla, which is valued at more than \$650 billion, more than General Motors, Ford Motor, Toyota Motor and Volkswagen combined. Wall Street's interest has encouraged a parade of fledgling companies — some, including Arrival, that are not yet selling vehicles, let alone making a profit — to list their shares on the stock exchange.

A few have already disappointed investors. The stock of Nikola, which is trying to develop heavy trucks powered by batteries and hydrogen fuel cells, plunged after a small investment firm, Hindenburg Research, said the company had exaggerated its technological abilities. Nikola denied wrongdoing but acknowledged in a February securities filing that some of what it had previously said about its vehicles and technology was inaccurate.

The Securities and Exchange Commission is investigating Nikola and another company, Lordstown Motors, which aims to make electric pickup trucks. Hindenburg also published a report about Lordstown, accusing it of exaggerating interest in its trucks and its production abilities. Lordstown denies Hindenburg's claims.

Many E.V. start-ups have acquired stock listings by merging with special purpose acquisition companies, or SPACs — businesses set up with a pot of cash and a stock listing. Such mergers allow start-ups to join the stock market without the scrutiny of an initial public offering of stock.

Arrival completed its merger with a SPAC in March. But it remains a long way from turning its vision into a viable business. It has assembled a few prototype vans but has not yet begun testing them on public roads. The company's shares started trading on March 25 at \$22.40 but have since fallen to about \$14.

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Arrival was founded in 2015 by Denis Sverdlov, a Russian telecoms tycoon who briefly served as a deputy minister for Russian media and had little auto experience. Mr. Sverdlov is listed as the company's chief executive, and he controls 76 percent of the company's stock through an investment fund based in Luxembourg.

The company's success hinges to a large extent on the viability of its microfactories — in Rock Hill, S.C.; Charlotte, N.C.; and Bicester, England.


On a recent afternoon, Mike Abelson, chief executive of Arrival's automotive business in North America and another former G.M. executive, showed off some prototype production robots at the Arrival van plant in England via Zoom.


During the videoconference, a robot, operating like a giant arm, picked up a beamlike part that provides strength along the side of a vehicle. Then another robot leaned in to apply adhesive to the part. None was actually applied in this demonstration, although Mr. Abelson said it had been done in other trials.


Mr. Abelson also showed a wheeled platform that is supposed to carry a vehicle from one robot cluster to the next. Finer tasks such as installing interior parts would be done by human workers.

The company must fine-tune all of this software and machinery to work precisely in order to turn several thousand p

“We’ve been very pleased as we get the equipment working in our simulations,” Mr. Abelson said. “Now it’s the comm and getting it right.”

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