

of losing business at petrol stations, they are developing ambitious schemes. After buying Ubitricity, a big European on-street charging firm, in February, Royal Dutch Shell, an Anglo-Dutch oil major, said in August that it planned to roll out 500,000 charging points around the world by 2025, both kerbside and fast charging. BP and Total have also been buying charging firms. Utilities are making a push, too. Wallbox, part-owned by Spain's Iberdrola, sells chargers for homes and workplaces. The Electric Highway Coalition, made up of 17 American power companies, plans to in-

stall fast charging along inter-city routes.

Governments will act. America's new infrastructure law sets aside \$7.5bn for the installation of 500,000 public points by 2030. Mandates such as that recently announced in Britain requiring new homes, workplaces and retail sites to have charging points, adding 145,000 every year, are likely to become more common. A reason for optimism is that improvements in batteries should continue to offer ever longer ranges, and so less need for frequent charging. Newer batteries will be replenished more rapidly than today's are, and chargers

will provide current more swiftly.

Doubts about the ramp-up nevertheless persist. The numbers are still small relative to the vast scale of charging networks the world needs. More money will be required to update electricity grids to distribute power to the new source of demand. BCG forecasts that America, Europe and China, home to most of the world's EVs, will have only 6.5m public chargers between them by 2030—not enough to meet the IEA's global target of 40m. More cars will vie for each charger. Drivers may need to seek patience as well as thrills. ■

Bartleby The shortcuts to Theranos

The Elizabeth Holmes saga contains lessons for decision-makers of all kinds

EARLY ON IN “The Inventor”, a documentary about Elizabeth Holmes, the founder of Theranos, she talks about her childhood-reading habits and her interest in what makes a great leader. “So much changes in our society technologically but as humans we don't change a lot,” she says in that slow, deep voice.

Whatever the verdict in Ms Holmes's ongoing trial, on charges of defrauding investors and patients by making false claims about the startup's blood-testing technology, she is right about that. The story of Theranos is not simply about how its leaders behaved, and whether they deliberately misled others. (Ms Holmes denies the charges.) It is also about how people take decisions. The trial has shown how cognitive shortcuts helped propel the firm to a valuation of more than \$9bn, before reporting by the *Wall Street Journal*, revealing that its proprietary technology did not work, sent it spiralling towards oblivion.

One shortcut concerned Ms Holmes herself. On the face of it, Theranos's product was a blood-testing device. In fact, the firm's real product was its founder, a fundraising machine in a turtle-neck. Her charisma intoxicated investors, lured employees and charmed the elder statesmen who crammed the startup's board. Her story—a female entrepreneur who had dropped out of Stanford to disrupt the world of health care—was catnip to journalists.

Charisma is a reasonable trait for investors to like in a startup founder. But people too easily equate confidence with competence. In a study from 2012, researchers from the University of Lausanne taught a bunch of mid-level managers a set of “charismatic leadership tactics”—from three-point lists and moral conviction to hand gestures. Ob-

servers' assessment of the managers' competence leapt as a result.

Some of Ms Holmes's charisma may likewise have been learned. Her defence team has entered two handwritten documents into the court records. One is a note in which she lays out a list of instructions to herself for the day ahead. The other is a set of business rules penned for her by Sunny Balwani, Theranos's one-time chief operating officer and Ms Holmes's former lover, whose own trial begins next year. (Ms Holmes's defence rests in part on her allegations that she was abused, moulded and controlled by Mr Balwani, which he denies.)

The documents themselves look risible. “All the laws of nature, all secrets, are imprinted on every cell of our body,” writes Mr Balwani, a somewhat concerning statement from the leader of a medical startup. Ms Holmes's note includes lines such as “I know the outcome of every encounter”, “I constantly make decisions and change them as needed” and “My hands are always in my pockets or gesturing”. But the formula, if that is what it was,

seems to have worked. Seasoned executives at large companies lauded Ms Holmes for “owning the room”, but ignored warning signs that the firm's product did not work.

That may have been because of a second decision-making shortcut: many investors and executives relied heavily on the judgments of others rather than their own eyes. Large chunks of the trial have focused on the addition of the logos of drugmakers like Pfizer and Schering-Plough, without their knowledge, to reports that seemed to validate Theranos's technology. A former chief financial officer of Walgreens, a pharmacy chain that teamed up with the startup, testified that he thought the reports were written by the pharmaceutical firms, when in fact they had found the technology wanting. Ms Holmes has said that she added the logos herself, claiming to have done so in good faith.

It is simply not practical to fact-check everything, or to run a business on the assumption that all information has been doctored. There was no reasonable way to infer from the documents that Pfizer and Schering-Plough were unimpressed by Theranos's devices. But at some point due diligence has to extend to seeing a technology in action.

The story of Theranos is not just about Ms Holmes's guilt or innocence. It raises questions about Silicon Valley's “fake-it-till-you-make-it” culture, investors' fear of missing out on the next big thing and the scrutiny that private firms receive compared with listed peers. It is also about the thought patterns that helped Ms Holmes soar. When you review a job candidate's credentials or take comfort from logos on a website, when you are blown away by someone's charisma, ask yourself what you really know.

