Critical Issues in Management - Leadership

Theranos' House of Cards[1]

1. The case study

Introduction

In 2014, the business world was enthusiastically embracing an entrepreneur who some were calling the next Steve Jobs.[2] This was most visible in a high-profile *Fortune* cover story[3], which cited the rising innovator's Stanford mentor, who enthusiastically noted "I realised that I could have just as well been looking into the eyes of a Steve Jobs or a Bill Gates". Like Steve, the person in question wore black turtlenecks, had a ground-breaking idea that could change an important field to the benefit of millions, was working to disrupt a long-standing, concentrated industry that could work better for its customers, and was a captivating speaker. Unlike Steve, whose Apple II computer was in stores and used by customers from 1977, this innovator's blood testing device, a machine named Edison, was proprietary. It was also largely kept from public and investor view. Despite this, investors flocked to the company. In 2004, $6.9 million was raised. By 2014, the figure was $400 million, based on a company valuation of $9 billion. Partners came on board as well, happy to set up testing centres using the company's technology. This included giants like Walgreens, giving the young company further legitimacy. Its founder, speaking at the 2015 Forbes Under 30 Summit, accepted the magazine's *Under 30 Doers Award*, stressing "we believe that transparency empowers the individual and empowering the individual will change the system".[4] Touted across business media, from Bloomberg to CNN, the company seemed set to become yet another Silicon Valley success story.

Yet, not all bought into the hype. The Pulitzer Prize-winning *Wall Street Journal* reporter John Carreyrou got suspicious about the secrecy surrounding the company's technology, and decided to investigate. The result was a piece published days after the Forbes summit.[5] It raised serious questions about Edison's capabilities. It also alleged the company had used other producers' test machines not only to conduct patient tests, but also to deceive regulators. The response from Edison's creator, appearing on CNBC's *Mad Money with Jim Cramer*, was swift: "this is what happens when you work to change things, and first they think

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[1] This case study was written in March 2018 (and updated in May 2019) by Maja Korica. Any sources consulted have been referenced directly. Any unintended errors are the responsibility of the author.

[2] Stockton, N. (April 5, 2016). 'Everything you need to know about the Theranos saga so far', *Wired*, https://www.wired.com/2016/05/everything-need-know-theranos-saga-far/

[3] Parloff, R. (June 12, 2014). 'This CEO is out for blood', *Fortune,* http://fortune.com/2014/06/12/theranos-blood-holmes/

[4] Hedgecock, S. (October 5, 2015). 'Elizabeth Holmes on using business to change the world', *Forbes*, https://www.forbes.com/sites/sarahhedgecock/2015/10/05/elizabeth-holmes-on-using-business-to-change-the-world/#2b6c9365dd7b

[5] Carreyrou, J. (October 15, 2015). 'Hot startup Theranos has struggled with its blood-test technology', *Wall Street Journal (online)*, https://www.wsj.com/articles/theranos-has-struggled-with-blood-tests-1444881901

you're crazy, then they fight you and then all of a sudden you change the world". The response tellingly echoed a cult 1997 Apple ad, which launched its Think Different campaign and reinvigorated it after Steve Job's return. The ad was a powerful salute to countercultural ideals and thinkers: "here's to the crazy ones. The misfits, the rebels, the troublemakers – the round pegs in the square holes. The ones who see things differently".

Like the rebels they saw themselves as, the company and its founder stuck to their story, and continued to challenge Carreyrou. Before long though, more journalists joined his investigations. They challenged the links to major pharma companies that the company previously stressed in interviews, questioned the amounts of capital raised and the suitability of its board of directors, and reported on a regulator's suspicion of the company's lab practices. These were soon followed by more public failures of testing, which began to impact patients too. Other regulators, including the U.S. Securities Exchange Commission (SEC) and the Department of Justice (DoJ), started own investigations. Investors failed lawsuits. The misfit innovators' centre of tech disruption increasingly looked like a falling house of cards.

The company in question was called Theranos. And the young innovator who sought to change the world? Her name was Elizabeth Holmes.

A story too good to resist?

As *The New Yorker* described in its 2014 profile of Holmes[6], "blood analysis is integral to medicine. When your [doctor] wants to check some aspect of your health, [like] your cholesterol or glucose levels, or look for indications of kidney or liver problems, a blood test is often required. This typically involves a long needle and several blood-filled vials, which are sent to a lab for analysis. Altogether, diagnostic lab testing [in the United States], including testing done by the two dominant lab companies, Quest and Laboratory Corporation of America, generates seventy-five billion dollars a year in revenue". In other words, blood analysis was important *and* a big business to boot.

Much has been made of Holmes' background and upbringing, as having played a big part in the eventual story of Theranos. In Holmes' words, like she told her father at age 9, her goal in life was already clear to her: "what I really want out of life is to discover something new, something that mankind didn't know was possible to do." This drive eventually landed her at Stanford, where she studied chemical engineering. Before long, Holmes joined the dean of the engineering school, Channing Robertson, and his PhD students in the lab and in research meetings. She then left for Singapore's Genome Institute, where she worked on SARS, and got the original idea to improve testing. In particular, "before returning to Stanford, Holmes conceived of a way to perform multiple tests at once, using the same drop of blood, and to wirelessly deliver the resulting information to a doctor. That summer, she filed a patent for the idea; it was ultimately approved, in November of 2007. Once back on campus, she went to see Robertson in his office and announced that she wanted to start a company. Robertson was impressed by the idea but urged her to at least consider finishing her degree first. "Why?" she responded. "I know what I want to do.""

[6] Auletta, K. (December 15, 2014). 'Blood, simpler', *The New Yorker*, https://www.newyorker.com/magazine/2014/12/15/blood-simpler

In March 2004, at age 19, she dropped out of Stanford and formed a company. Before long, Robertson joined her. Theranos was born.

Rise of a new Goliath

Theranos' goals were simple, and revolutionary: "extract blood without syringes, make a diagnosis from a few drops of blood, automate the tests to minimize human error, do the test and get the results more quickly, and do this more economically". In short, it was a win-win for all. As *The New Yorker* summarised, according to Holmes' 2014 talk at TEDMED (TED devoted to healthcare), "the company has developed blood tests that can help detect dozens of medical conditions, from high cholesterol to cancer, based on a drop or two of blood drawn with a pinprick from your finger. Theranos is working to make its testing available to several hospital systems and is in advanced discussions with the [world-famous] Cleveland Clinic. It has also opened centers in forty-one Walgreens [akin to UK's Boots] pharmacies, with plans to open thousands more. If you show the pharmacist your I.D., your insurance card, and a doctor's note, you can have your blood drawn right there. (The sample is then sent to a Theranos lab.) From that one sample, Holmes said, several tests can be run—all less expensive than standard blood tests, sometimes as much as ninety per cent below the rates that Medicare [the US national health insurance programme for the elderly and disabled individuals] sets. A typical lab test for cholesterol can cost fifty dollars or more; the Theranos test at Walgreens [pharmacy] costs two dollars and ninety-nine cents". As Holmes stressed, this had clear benefits for patients, and for medicine and public health more broadly. In particular, "Holmes thinks that getting a blood test should [be] a "wonderful" experience […]. She told the crowd that between forty and sixty per cent of people who are ordered by their doctor to get a blood test do not. Diabetes, sexually transmitted diseases, and other common medical conditions could be diagnosed and treated earlier if the tests were less onerous and more accessible, she said. "We see a world in which no one ever has to say, 'If only I'd known sooner"".

The business world was soon charmed too. As the *Fortune* reporter noted in the June 2014 cover story, Theranos "has 500 employees and has raised more than $400 million from equity sales to investors who have effectively valued the company at more than $9 billion. All these numbers [are being confirmed here for the first time]. Though Theranos is largely unknown even in Silicon Valley, that is about to change". The resulting enthusiasm was unsurprising, given details of *Fortune*'s account.

In particular, as the piece stressed, "Theranos today is a potentially highly disruptive upstart in America's $73 billion diagnostic-lab industry, which performs nearly 10 billion tests a year and is estimated to provide the basis for about 70% of doctors' medical decisions. […] Theranos runs what's called a high-complexity laboratory, certified by the federal Centres for Medicare & Medicaid Services (CMS), and it is licenced to operate in nearly every state. It currently offers more than 200 – and is ramping up to offer more than 1,000 – of the most commonly ordered blood diagnostic tests, all without the need for a syringe".

The article did stress that *how* Theranos was doing this was a trade secret. However, it cited a number of experts working with the company, who apparently offered their support. For example, one trauma expert, David Helfet at the Hospital for Special Surgery in Manhattan, shared that: ""the first time I heard about this, I thought it was snake oil and mirrors [i.e. fake]". […] But after reviewing [numerous] validation studies supplied to him by the company,

he has become a believer and is urging his hospital to consider [using it]". What a potential revolution this seemed to be.

Importantly, the revolution was given further legitimacy by what *Fortune* observed "may be the single most accomplished board in U.S. corporate history". Theranos' board of directors featured the former US Secretary of State and National Security Adviser Henry Kissinger, the former US Secretary of State, Treasury and Labour George Shultz, and two former US senators, including a heart transplant surgeon. They were joined by David Boies as the legal advisor, whose cases included the anti-trust prosecution of Microsoft, and the case of *Bush vs. Gore* that decided the 2000 US election. As the retired US Marine Corps General James Mattis commented, when asked about his motivation for joining Theranos' board, "the strength of the leader's vision in the military is seen as the critical element in that unit's performance. I wanted to be around something again that had that sort of leadership". As for Henry Kissinger, who had seen quite a few leaders in his career, he said "I can't compare her to anyone else because I haven't seen anyone with her special attributes. She has iron will, strong determination. […] There is no performance associated with her".

With early investors including Draper Fisher Jurvetson (who funded Tesla and SpaceX) and Oracle's Larry Elison, and retaining over 50% of the company stock, Holmes seemed close to achieving her childhood dream. According to *Fortune*, this included being listed as co-inventor on "82 U.S. and 189 foreign patent applications, of which 18 in the U.S. and 66 abroad have been granted". By 2015, *Forbes* named Holmes, then age 31, as the youngest self-made female billionaire in the world.

Despite this, a major bend on this road to success was just ahead.

A space fit for disruption?

An important factor to keep in mind is the context in which Holmes and Theranos sought to innovate. In the words of *The New Yorker* journalist, "Theranos has managed to keep its technology a secret for much of its decade of existence in part because it occupies a regulatory grey area. Most other diagnostic labs [in the US], including Quest and Laboratory Corporation of America, perform blood tests on equipment that they buy from outside manufacturers, like Siemens and Roche Diagnostics. Before those devices can be sold, they must be approved by the [national regulator, the US Food and Drug Administration], a process that makes their tests' performances more visible to the public. But, since Theranos manufactures its own testing equipment, the F.D.A. doesn't need to approve it, as long as the company doesn't sell it or move it out of its labs." Indeed, as the 2014 *Fortune* piece stressed, Theranos was at the time seeking F.D.A. approval for each of its tests, though it was formally not legally obliged to do so. Indeed, the trade group for traditional diagnostic labs had long opposed the F.D.A. requiring such approval. One could therefore argue that while Theranos did not have F.D.A. oversight, much of the existing industry of diagnostic labs do not have, nor want, approval for their lab-developed tests either. As such, what was the difference?

But it was not just the perceived lack of regulatory oversight that was an issue. The company was also notoriously lacking in transparency when it came to how the technology worked. As *The New Yorker* journalist noted, "some observers are troubled by Theranos's secrecy; its blood tests may well turn out to be ground-breaking, but the company has published little data in peer-reviewed journals describing how its devices work or attesting to the quality of

the results. “It’s trying to apply the Steve Jobs way of keeping everything secret until the iPhone was released,” Lakshman Ramamurthy, a molecular biologist and a former associate director at the [US national regulator] F.D.A., told me. “But a health test is more consequential than a consumer product. It needs to be clinically valid and provide useful information””.

As the *Fortune* journalist further added, “sceptics also question Theranos’ business model. They doubt its ability to scale up anytime soon to the levels necessary to become a serious competitor, especially since the business has so many unglamorous aspects. [These include billing], customer service, sorting, regulatory compliance, and the logistics of transporting samples from physicians to labs. Quest [a major traditional competitor], for instance, employs 45,000 people; owns a fleet of 3,000 vehicles and 20 airplanes; and runs eight regional hub labs, 150 satellite labs, and 2,200 patient service centres. Critics are likewise puzzled by the cosmic vastness of Holmes’ end-to-end business model. If Theranos is making breakthrough [technology…], why doesn’t it just sell [these] to existing labs? To these critics, for Theranos to compete in the lab business itself while making all its own [testing technology] sounds [almost] crazy – like [DHL manufacturing] all its own airplanes and trucks”.

For a time, such doubts were left unanswered. Then came *The Wall Street Journal.*

‘Fake it till you make it’

As the *Vanity Fair* summarised in its 2016 long-read[7], “it was late morning on Friday October 16, when Elizabeth Holmes realised that she had no other choice. She finally had to address her employees […]. Two days earlier, a damning report published in *The Wall Street Journal* had alleged that the company was, in effect, a sham – that its [much advertised] core technology was actually faulty and that Theranos administered almost all of its blood tests using competitors’ equipment. The article created tremors throughout Silicon Valley, where Holmes […] had become a near universally praised figure”. For the next two days, Holmes was “largely holed up in a conference room, surrounded by her inner circle, [….] including Ramesh “Sunny” Balwani, then Theranos’ president and [Chief Operating Officer…]; lawyers from Boies, Schiller & Flexner, the [fearless] law firm; and crisis-management consultants”.

Holmes being at the centre of decision-making was no surprise, given least of all her management style at Theranos. In particular, “Holmes had learned a lot from Jobs. Like Apple, Theranos was secretive, even internally. Just as Jobs had famously insisted [at Apple], Holmes largely forbade her employees from communicating with one another about what they were working on – a culture that resulted in a rare [extent] of executive [knowledge and oversight]. At Theranos, Holmes was founder, C.E.O., and chairwoman. There wasn’t a decision – from the number of American flags framed in the company’s hallways […] to the compensation of each new hire – that didn’t cross her desk. And like Jobs, crucially, Holmes also paid [particular] attention to her company’s story, its “narrative”. Theranos was not simply [trying] to make a product that sold off the shelves and lined investors’ pockets; rather, it was attempting something far more poignant. […] In a technology sector populated by [countless] food-delivery apps, her [idealistic] ambition was applauded”.

[7] Bilton, N. (September 6, 2016). ‘Exclusive: How Elizabeth Holmes’ house of cards came tumbling down’, *Vanity Fair*, https://www.vanityfair.com/news/2016/09/elizabeth-holmes-theranos-exclusive

Such ambition nevertheless sat uneasily with some, especially when coupled with Theranos' uncommon evasiveness. In particular, John Carreyrou of *The Wall Street Journal* "was struck by Holmes' limited ability to explain how it all worked. When *The New Yorker* reporter asked about Theranos' technology, she responded, somewhat cryptically, "a chemistry is performed so that a chemical reaction occurs and generates a signal from the chemical interaction with the sample, which is translated into a result, which is then reviewed by certified laboratory personnel". Shortly after reading the article, Carreyrou started investigating Theranos' medical practices. As it turned out, there was an underside to Theranos' story that had not been told – one that involved questionable lab procedures and results, among other things".

The story was published on October 15, 2015, and it came with a bang. As *Vanity Fair* recounted, "according to numerous insiders, Holmes heard various response strategies [in the days after]. The most [obvious] suggestion advocated enlisting members of the scientific community to publically defend Theranos. [However] no scientist could credibly vouch for Theranos. Under Holmes' direction, the secretive company had barred other scientists from writing peer-reviewed papers on its technology". Instead, Holmes went on Jim Cramer's *Mad Money* show on CNBC. There, "when Cramer asked Holmes for a [brief] true-or-false answer about an accusation in the article, she replied with a meandering 198-word [reply]". She then returned to her company headquarters, where she gave an "impassioned" speech, arguing Carreyrou, the journalist, "was simply picking a fight". After she finished, "a chant erupted. "F**k you", employees began yelling in unison, "Carreyrou"".

Importantly, as *Vanity Fair* stressed, Carreyrou was far from being the first sceptic. In particular, when Holmes first came up with her testing idea, "she approached several of her professors at Stanford […]. But most explained to [her] that it was virtually impossible to do [this] with any real efficacy. […] But Holmes was nothing if not determined". Holmes also launched investment rounds that were unusual even by Silicon Valley standards. Specifically, "she took the money on the condition that she would not divulge to investors how her technology actually worked, and that she had final say and control over every aspect of her company". This scared off some, including Google Ventures. Their representative took the test at its Walgreens testing centre, which soon raised alarms: it involved vials of blood, not the touted pinprick.

Another notable question-mark emerged following the involvement of Ian Gibbons, "an accomplished British scientist who had a slew of degrees from [the University of Cambridge] and had spent 30 years working on diagnostic and therapeutic products. […] In 2005, Holmes named him chief scientist". Gibbons soon encountered major problems, most chiefly that "the results were off. […] This conclusion soon led Gibbons to realise that Holmes' invention was more of an idea than a reality. Still, bound by the scientific method, Gibbons wanted to try every possible direction and exhaust every option". He continued his attempts, while Holmes continued to hire sales and communications staff, and present "her company to more investors, and even potential partners, as if it had a working, fully realised product". In 2012, for instance, the U.S. Department of Defence wanted to use its technology in Afghanistan, but soon backed off after realising "that the technology wasn't entirely accurate, and that it had not been vetted by [the regulator]". Interestingly, General James Mattis, whose 2016

government filing disclosed a fee of $150,000 for serving on Theranos' board[8], "immediately e-mailed his colleagues about moving the project forward".[9]

In the meantime, another lawsuit resulted in requests for Theranos' executives to appear in court. However, "Gibbons didn't want to testify. If he told the court that the technology did not work, he would harm the people he worked with; if he wasn't honest about the technology's problems, however, consumers could potentially harm their health, maybe even fatally". According to Gibbons' wife, Holmes "did not seem willing to tolerate his resistance". Specifically, "even though Gibbons had warned that the technology wasn't ready for the public, Holmes was preparing to open 'Theranos Wellness Centres' in dozens of Walgreens across Arizona. "Ian felt like he would lose his job if he told the truth", [his wife told the journalist]". Notably, Channing Robertson remembered the conversation differently: Gibbons felt there was enough there.

In May 2013, a call came from Holmes' office asking for a meeting the next day. Fearful he was going to be fired, "Ian Gibbons tried to commit suicide". He died a week later. According to *Vanity Fair*, "when [his wife] called Holmes' office to explain what had happened, the secretary was devastated and offered her sincere condolences. She told Rochelle Gibbons that she would let Holmes know immediately. But a few hours later, rather than a condolence message from Holmes, Rochelle instead received a phone call from someone at Theranos demanding that she immediately return any and all confidential Theranos property".

No doubt

According to *Vanity Fair*, the person in charge of ensuring that growing doubts didn't escalate was Sunny Balwani, the president and chief operating officer. In particular, "Balwani, who had previously worked at Lotus and Microsoft, had no experience in medicine. He was hired in 2009 to focus on e-commerce. Nevertheless, he was soon put in charge of the company's most secret medical technology. [This also meant that] when employees questioned the accuracy of the company's blood-testing technology, it was Balwani who would chastise them in e-mails (or in person), sternly telling staffers "This must stop". […]

He ensured that scientists and engineers at Theranos did not talk to one another about their work. Applicants who came for job interviews were told they wouldn't know what the actual job was unless they were hired. Employees who spoke publicly about the company were met with legal threats. On LinkedIn, one former employee noted […] "I worked here, but every time I say what I did I get a letter from a lawyer" […] If people visited any of Theranos' offices and refused to sign the company's lengthy non-disclosure agreement, they were not allowed inside".

Indeed, employee reviews posted on the workplace website *Glassdoor*[10] seemingly support Theranos' characterisation as having a "toxic culture and extreme micromanagement". For instance, one employee wrote in February 2015 that "the office culture is extremely toxic.

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[8] Nominee Report, U.S. Office of Government Ethics, 5 C.F.R. part 2634, signed December 16, 2016: https://extapps2.oge.gov/201/Presiden.nsf/PAS+Index/6B4B269192D2E5B1852580A2002C738E/$FILE/Mattis,%20James%20N.%20final%20278.pdf

[9] See also Chapter 10 in John Carreyrou's *Bad Blood* for a detailed account.

[10] Widdicombe, L. (January 22, 2018). 'Improving workplace culture, one review at a time', *The New Yorker*, https://www.newyorker.com/magazine/2018/01/22/improving-workplace-culture-one-review-at-a-time

Executive leadership treats the majority of the company with little to no respect and tries to be involved in every small detail of their work. It is clear that they do not trust their employees one bit to do their jobs or know any information about the company strategy across teams. […] People rarely stay longer than a year due to this culture, and the people that do stay are miserable". Another noted they had "never felt less like a human and more like a robot in any other position I've been in throughout my entire work history".[11]

However, the biggest challenge to this culture of no doubt came from an unexpected source: Tyler Shultz, the grandson of Theranos' board member George Shultz. In particular, in another report[12], John Carreyrou recounted how Tyler "fell in love with [Holmes'] vision" after meeting her in 2011. He eventually joined Theranos after finishing his studies at Stanford in September 2013, just as Theranos started offering blood tests to the public. Tyler was assigned to the team that "was responsible for verifying and documenting the accuracy of blood tests run on Edison machines before they were deployed in the lab. Mr. Shultz says he found that results varied widely when tests were rerun with the same samples. To reduce that variability, Theranos routinely discarded outlying values from validation reports". This meant patients were potentially getting the wrong diagnoses. Shultz then moved teams, where "he noticed Edison machines often [failed] Theranos' quality control standards, [adding] Mr. Balwani pressured lab employees to ignore the failures and run blood tests on the machines anyway, contrary to accepted lab practice". He raised his concerns with Holmes, who advised him to speak to a relevant vice-president. When received answers weren't helpful, and having anonymously gotten word from regulators that what he was describing was cheating, Shultz emailed Holmes with a formal complaint.

This claimed that "Theranos had doctored research and failed quality-control checks. The reply was withering. Ms. Holmes forwarded the email to Theranos President Sunny Balwani, who belittled Mr. Shultz's grasp of basic mathematics and his knowledge of laboratory science. […] Mr. Shultz quit that day. As he was leaving Theranos' headquarters, […] he got a frantic phone call from his mother, who told him Ms. Holmes had just called the elder Mr. Shultz to warn that his grandson would "lose" if he launched a vendetta" against Theranos. As it was, Tyler Shultz was the first whistle blower among several employees to formally speak to the state regulators. He also contacted *The Wall Street Journal* as a confidential source. His stated motivation was simple: "to protect patient health and his grandfather's reputation"".

Theranos' response was to accuse Shultz of leaking trade secrets, and breaking his non-disclosure agreement. Its lawyers met him at his house, and he suspects he was followed by private investigators too. His grandfather also acted as broker, whereby Theranos would not sue Shultz, if he would admit to having spoken to a journalist, and if he shared which other employees he was aware of who may have done so. After legal advice, Shultz refused. Since then, he has cooperated with federal investigations into whether "the company misled investors and regulators about its technology and operations". His account was eventually confirmed by federal inspections.

[11] See https://www.glassdoor.com/Reviews/Employee-Review-Theranos-RVW5859957.htm

[12] Carreyrou, J. (November 7, 2016). 'Theranos whistleblower shook Theranos – and his family', *The Wall Street Journal,* https://www.wsj.com/articles/theranos-whistleblower-shook-the-companyand-his-family-1479335963

Fall from grace

Theranos' resulting fall was swift. First came the investigations. According to *Vanity Fair*, "on August 25, 2014, months before the *Journal* story broke, three investigators from the F.D.A. arrived, unannounced, at Theranos' headquarters, […] with two more investigators sent to the company's blood-testing lab in Newark, California, demanding to inspect the facilities. […] Around the same time, regulators from [C.M.S.], which regulates laboratories, visited the labs and found major inaccuracies in the testing being done on patients. (The Newark lab was run by an employee who was criticised for insufficient laboratory experience). C.M.S. also soon discovered that some of the tests Theranos was performing were so inaccurate that they could leave patients at risk of internal bleeding, or of stroke [… They] found that Theranos appeared to ignore erratic results from its own quality-control checks during a six-month period last year and supplied 81 patients with questionable test results".

In *Vanity Fair*'s reporting, Theranos and Holmes believed the first of Carreyrou's articles would blow over, or that the company could minimise the damage in the same way it always did: via narrative. As it happens, this was an error in judgment. In particular, "Carreyrou subsequently wrote more than two dozen articles about the problems at Theranos. Walgreens severed its relationship with Holmes, [shutting down] all of its Wellness Centres. The F.D.A. banned the company from using its Edison device. In July [of 2016], the Centres for Medicare and Medicaid Services banned Holmes from owning or running a medical laboratory for two years. […] Then came the civil and criminal investigations by the [SEC] and the U.S. Attorney's Office for the Northern District of California, and two class-action fraud [law]suits". The FBI got involved. Others distanced themselves, including GlaxoSmithKline, Pfizer, and the Cleveland Clinic, which earlier articles suggested were actively involved as partners.[13] The medical community joined the criticism.[14] In one example[15], two scientists "called the science behind the technology "elusive", decried "the absence of any form of peer review", and said the way in which blood samples were analysed was "unknown"".

The media turned their backs too. This notably included the tech press, who some suggested may be as responsible as Holmes, for failing to ask critical questions.[16] Most notably, the *Fortune* journalist Roger Parloff, who published the 2014 cover story, issued a long retraction in December 2015.[17] In it, Parloff acknowledged that "as much as I'd like to say that Holmes lied to me, I don't think she did. I do believe I was misled – intentionally – but I was also culpable, in that I failed to probe certain [infuriatingly non-transparent] answers that I repeatedly received".

With this in mind, Theranos could be seen as a demonstration of a bigger story of Silicon Valley. In particular, as the *Vanity Fair* journalist argued, "[there], every company has an origin story – a fable, often slightly embellished, that humanises its mission for the purpose of

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[13] Crow, D. and Samson, A. (October 23, 2015). 'Theranos blood labs under fresh scrutiny on staffing and quality', *Financial Times*, https://www.ft.com/content/67c9b894-7903-11e5-a95a-27d368e1ddf7

[14] Paradis, N.A. (April 22, 2016). 'The rise and fall of Theranos', *The Conversation/Scientific American,* https://www.scientificamerican.com/article/the-rise-and-fall-of-theranos/

[15] Popken, B. (January 6, 2017). 'How $9 billion startup Theranos blew up and laid off 41%', *NBC News*, https://www.nbcnews.com/health/health-news/here-s-why-it-s-so-hard-make-better-flu-n848081

[16] Bilton, N. (May 2, 2016). 'The secret culprit in the Theranos mess', *Vanity Fair*, https://www.vanityfair.com/news/2016/05/theranos-silicon-valley-media

[17] Parloff, R. (December 17, 2015). 'How Theranos misled me', *Fortune,* http://fortune.com/2015/12/17/how-theranos-misled-me-elizabeth-holmes/

winning over investors, the press, and […] customers, too. These origin stories can provide a unique, and uniquely powerful, lubricant in the Valley. After all, while Silicon Valley is responsible for some truly astounding companies, its business dealings can also replicate one big confidence game in which entrepreneurs, venture capitalists, and the tech media pretend to vet one another while, in reality, functioning as cogs in a machine that is destined to not question anything – and [so support] one another along the way". For a *Harvard Business Review* commentator[18], in turn, as business storytelling becomes exceedingly popular, Theranos ought to be seen as "a cautionary tale" for responsible corporate communications. Storytelling without "a rock-solid ethical foundation" and honesty was nothing more than a "weapon of psychological and emotional manipulation". As such, Theranos was also a reminder that "establishing a culture of honest storytelling is not only a moral imperative […., but also] better business in the long-term".

Not everyone agreed, of course. Most notably, Tim Draper, venture capitalist at Draper Fisher Jurvetson, early investor and Holmes' family friend, was still defending Theranos in early 2017.[19] He stressed to Bloomberg that "nothing's gone wrong with Theranos", calling critical news stories (including by Carreyrou), "a witch hunt". In particular, he stressed this was akin to ""there's a great woman entrepreneur and she's on the cover of *Forbes*. Let's see what we can do to take her down" […]". Despite such accusations, Theranos itself "reportedly told regulators [in 2016] that it had voided "all" of the blood-testing results from its proprietary Edison machines from 2014 and 2015. [This means] tens of thousands of patients may have been given incorrect blood-test results, and their doctors may have administered unnecessary or potentially harmful treatments as a result".

Where was the board in all this?

Tellingly, even as critical stories proliferated, the original "11-man" board stuck by Holmes. This was despite questions being raised of their own fitness. As *Fortune* noted[20], it seemed to be "assembled for its regulatory and governmental connections, not for its understanding of the company or its technology". In addition, it didn't feature any sitting chief executives, or practicing medical experts. Finally, the board, whose average age was 80, had no formal accounting or auditing experience.

In May 2017, *Wall Street Journal* reported[21] that two of its former original board members "didn't think to question executives" following growing allegations. Instead, they trusted Holmes' claims. As George Shultz noted, "I didn't probe into it. It didn't occur to me". When asked about whether he knew Theranos relied on other companies' technologies for its tests, the former U.S. Navy Admiral Gary Roughead said ""I don't have the information that would tell me that it's true or not true". […] Asked whether he ever asked Ms. Holmes about the matter, Mr. Roughead said: "I did not ask her directly, no". Asked whether he questioned

[18] Gottschall, J. (October 18, 2016). 'Theranos and the dark side of storytelling', *Harvard Business Review*, https://hbr.org/2016/10/theranos-and-the-dark-side-of-storytelling

[19] Kosoff, M. (January 18, 2017). 'Theranos investor claims there's a conspiracy to take down Elizabeth Holmes', *Vanity Fair*, https://www.vanityfair.com/news/2017/01/theranos-investor-claims-theres-a-conspiracy-to-take-down-elizabeth-holmes

[20] Reingold, J. (October 15, 2015). 'Theranos' board: Plenty of political connections, little relevant expertise', *Fortune*, http://fortune.com/2015/10/15/theranos-board-leadership/

[21] Weaver, C. (May 31, 2017). 'Theranos directors missed red flags', *Wall Street Journal*, https://www.wsj.com/articles/court-documents-shed-light-on-theranos-boards-response-to-crisis-1496136600

anyone else at the company, Mr. Roughead said: "I did not"". Both left Theranos' board of directors in October 2015, but remained on its "board of counsellors" until December 2016[22].

A *Vanity Fair* article described it differently: a former board member "admitted that board members asked tough questions but were fed contrived answers. (Notably, the board was stacked with dignitaries, not scientists)"[23]. When the board eventually got tired of avoidance, Holmes changed its membership. By then, the damage was done.

The end?

In November 2016, Walgreens sued the company for breach of contract.[24] It sought damages of $140 million – entirety of its investment – and suggested that Theranos misled it about its technology, and its other problems. In August 2017, they reached a confidential settlement, which "will result in the dismissal of Walgreens' lawsuit against Theranos, with no finding or implication of liability".[25] This joined settlements with the Arizona attorney general, a US regulator, and one of its investors.

In January 2017, "for the second time in less than four months, Theranos [announced it was] cutting its workforce nearly in half, laying off more than 100 employees", which left "a core team of 220".[26] This followed news from summer 2016 that it was launching a new technology, and confirmation in October 2016 that it would close all of its blood-testing facilities, following Holmes's ban. In February 2017, an *Entrepreneur* contributor reflected on *The Wall Street Journal* report that Theranos told investors it had no material sales (i.e. income) in 2015 and 2016. As he noted[27], "hard to believe. Thirteen years. 1,000 employees. $700 million of venture capital. Forty wellness centres. Two labs. Six million blood tests. Nothing to show for it?" In his mind, "this is what happens when people feel entitled to run the show without the experience […] to be effective. This is what happens when people treat ventures so casually and callously that risk becomes immaterial. This is what happens when people are so taken with the fashion of the day that they're blind to the realities of business".

The *Bloomberg* piece also stressed that "former Theranos employees described a workplace ruled by secrecy and fear, where workers put in long hours trying to make the company's testing system perform as advertised". In particular, "Erika Cheung, a Theranos lab worker, grew so nervous about the accuracy of test results that she wrote a letter to federal regulators outlining her concerns, [… noting] she felt guilty because she didn't trust the technology and "wouldn't recommend my sister get this test done". [She also stressed that] company

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[22] Pollack, A. (October 28, 2015). 'Theranos, facing criticism, says it has changed board structure', *The New York Times*, https://nyti.ms/2kteATA

[23] Bilton, N. (February 20, 2019). 'She never looks back': Inside Elizabeth Holmes's chilling final moments at Theranos', *Vanity Fair*, https://www.vanityfair.com/news/2019/02/inside-elizabeth-holmess-final-months-at-theranos

[24] Weaver, C., Carreyrou, J. and Siconolfi, M. (November 8, 2016). 'Walgreen sues Theranos, seeks $140 million in damages', *The Wall Street Journal*, https://www.wsj.com/articles/walgreens-seeks-to-recover-140-million-investment-from-theranos-1478642410

[25] Kosoff, M. (August 2, 2017). 'Elizabeth Holmes is running out of cash', *Vanity Fair*, https://www.vanityfair.com/news/2017/08/theranos-walgreens-settlement-running-out-of-cash

[26] Tracy, A. (January 6, 2017). 'Theranos lays off another 41% of its workforce", *Vanity Fair*, https://www.vanityfair.com/news/2017/01/theranos-layoffs

[27] Tobak, S. (February 22, 2017). 'Theranos: The house of cards that Elizabeth Holmes built', *Entreprenuer*, https://www.entrepreneur.com/article/289444

executives frequently demanded that staff "hide things from people, […] whether it was regulators or [outside vendors]"".

In summer of 2017, the SEC questioned Holmes, who responded "I don't know" over 600 times. According to depositions, she was asked if Edison "was ever "deployed in emergency rooms, hospitals, on the battlefield or in medevac helicopters. They were claims she had made to board members like George Shultz. Her answer this time was "No." Holmes also was questioned on claims she made to the media. Specifically, the accuracy of telling the Fortune writer Roger Parloff, for his cover story in 2014, that Theranos "offers more than 200, and is ramping up to offer more than 1,000 of the most commonly ordered blood diagnostic tests, all without the need for a syringe." Holmes's response in her deposition: "Reading it now, I don't think it is."".[28]

According to *Fortune*[29]*,* in December 2017 Theranos received a "Christmas miracle" via a $100 million loan, thus saving it from near bankruptcy. As the journalist noted, "the Fortress loan will be conditional on "achieving certain product and operational milestones". It's unclear whether those might include positive outcomes for the multiple investigations and lawsuits still facing the company".

As for Elizabeth Holmes, after the first *Journal* story, she initially still gave speeches, and attended media interviews and industry dinners, before turning full time to rescuing Theranos. According to *Vanity Fair*, writing in August 2017, "after nearly two years of scandals, Holmes is trying to rebuild Theranos as a smaller, more grounded company, free of the mythologizing and [grand] claims that were her downfall".

As one Stanford professor told another *Vanity Fair* journalist, through it all one thing seemed clear: "Elizabeth Holmes won't stop".

Postscript

In March 2018, the SEC charged Holmes and Balwani of conducting an "elaborate, years-long fraud in which they exaggerated or made false statements about the company's technology, business, and financial performance".[30] She agreed to a reduced equity stake in the company, as well as a 10-year ban on serving as an executive in public companies.[31] In May, Carreyrou released *Bad Blood: Secrets and Lies in a Silicon Valley Startup*. The book won the *FT & McKinsey Business Book of the Year* award. The judges stressed its lesson of the need for "proper trade-offs between fostering innovation and conducting due diligence" was relevant for Silicon Valley as a whole, not just the disgraced company.[32] The book was followed by an

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[28] Dunn, T., Thompson, V., Jarvis, R. and Louszko, a. (January 23, 2019). 'Ex-Theranos CEO Elizabeth Holmes says 'I don't know' 600-plus times in never-before-broadcast deposition tapes', *ABC News*, https://abcnews.go.com/Business/theranos-ceo-elizabeth-holmes-600-times-broadcast-deposition/story?id=60576630

[29] Morris, D.Z. (December 23, 2017). 'Theranos secures $100 million in new funding from Fortress Capital', *Fortune*, http://fortune.com/2017/12/23/theranos-secures-100-million-in-new-funding-from-fortress-capital/

[30] https://www.sec.gov/litigation/complaints/2018/comp-pr2018-41-theranos-holmes.pdf

[31] Griffith, E. (March 14, 2018). 'Theranos and Silicon Valley's 'fake it till you make it' culture', *Wired*, https://www.wired.com/story/theranos-and-silicon-valleys-fake-it-till-you-make-it-culture/

[32] Hill, A. (November 12, 2018). 'Bad Blood wins the FT and McKinsey Business Book of 2018', *Financial Times*, https://www.ft.com/content/54095824-e682-11e8-8a85-04b8afea6ea3

HBO documentary *The Inventor* and an ABC podcast *The Dropout*[33], but also by news that Theranos was no more. In September 2018, three months after Holmes was charged by federal prosecutors for wire fraud (a criminal trial for which a possible outcome is 20 years in prison), the company announced it would be formally dissolving.[34]

In line with the Stanford professor's prediction however, while this may have been the end for Theranos, it was not for Holmes. As Nick Bolton reported in February 2019, Holmes, who had continued to enjoy a luxurious lifestyle on Theranos' expense during its gradual decline, "still doesn't seem to think the work of Theranos is finished. […] She had recently held more meetings with filmmakers to try to collaborate on a documentary about her 'real' story. And Holmes desperately wants to write a book. In Holmes's eyes, according to former employees, this is only the beginning of yet another redemption story – possibly one that is too good to be true".

Appendix A. The original Theranos board of directors

NAME	CLAIM TO FAME	BIRTH YEAR	SEX
Henry Kissinger	Former U.S. Secretary of State	1923	Male
Bill Perry	Former U.S. Secretary of Defense	1927	Male
George Shultz	Former U.S. Secretary of State	1920	Male
Sam Nunn	Former U.S. Senator	1938	Male
Bill Frist	Former U.S. Senator	1952	Male
Gary Roughead	Former Navy Admiral	1951	Male
James Mattis	Former Marine Corps General	1950	Male
Dick Kovacevich	Former CEO of Wells Fargo	1943	Male
Riley Bechtel	Former CEO of engineering firm Bechtel	1952	Male
William Foege	Former epidemiologist	1936	Male
Sunny Balwani	Theranos executive (President and COO)	1965	Male
Elizabeth Holmes	Theranos executive (Founder and CEO)	1984	Female

Source: Clearfield, C. and Tilcsik, A. (2018). *Meltdown: Why our systems fail and what we can do about it*. Penguin.

[33] http://abcradio.com/podcasts/the-dropout/

[34] Carreyrou, J. (September 5, 2018). 'Blood-testing firm Theranos to dissolve', *The Wall Street Journal*, https://www.wsj.com/articles/blood-testing-firm-theranos-to-dissolve-1536115130