

‘Fake it Till You Make it’ Culture in Silicon Valley Startups

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

Startups are often lauded for their potential for disruptive positive changes and as beacons of entrepreneurship, innovation and technological progress. Their main focus is often on developing new products that will “change the industry” or “revolutionize the way we live”, rather than less exciting products that are merely incremental improvements over existing ones. Companies aim to be disruptive and they pursue extremely fast growth of their businesses, scaling at lightning-fast speeds in an effort to capture new markets before potential competitors. This culture of overambition presents many possible dangers and incentivizes new companies to over promise on claims they can’t fulfill. Many startups embody a culture of “Fake it Till You Make It” with overly optimistic projections and unrealistic visions that they have little chance of meeting. When startups find themselves falling behind on these lofty expectations they have to “fake it” in the hopes they will be able to catch up. Startups often resort to deceit and misleading claims and practices in order to keep up appearances – often with disastrous results.

Methods

First, I will explore a case study and examine the culture of start-ups by looking at the once promising and now defunct Silicon Valley blood-testing company, Theranos. Theranos was once lauded as a game-changer in the lab testing industry that promised real changes for medicine and health. Just a few years ago the company was valued in the billions and had partnerships with huge corporations like Safeway and Walgreens. From the outside, everything appeared to be looking up. However, it soon came to light that the company had been less than forthcoming at best about the real state of their technology and things quickly crumbled from there. Many of the company’s biggest claims had been misleading at best or completely false and

dangerous at worst. Behind the scenes Theranos was a mess and desperately struggling, without success, to keep up with the rosy predictions and expectations they had been pitching to investors and business partners. Tests being conducted on real patient samples were unreliable and often incorrect. Later two years worth of patient tests would be voided by the company (Huddleston, 2016). In just a few years the company has been dissolved, has been the subject of numerous investigations and its founder was recently found guilty of wire fraud for defrauding investors and faces up to 20 years in federal prison (Paul, 2022). Was this case an anomaly or a sign of a much darker side to Silicon Valley's startup culture?

This case study will show how overambitious attitudes in Silicon Valley are dangerous and can lead to ethical lapses and immense social harm. A few other Silicon Valley startups will also be examined to explore how Theranos might reflect startup culture in Silicon Valley in general and whether or not this culture will be maintained or changed in the future.

Beginnings

Following in the footsteps of other college dropouts turned multi billionaire entrepreneurs, Theranos was founded by then 19-year old Elizabeth Holmes upon dropping out of Stanford in her second year. Holmes had little minimal medical expertise or lab experience, but she had big ideas, a key currency in Silicon Valley. The idea for Theranos' future signature product was simple: a small blood testing device that would make lab testing affordable and convenient. If successful it promised to hugely disrupt and revolutionize the existing lab testing industry. The device would allow patients to get the information to inform their health and medical decisions without the obstacles or costs of the typical process. Patients wouldn't have to book an appointment and get a painful intravenous blood draw and then weeks for expensive test results. Instead of visiting a doctor they could go to a local pharmacy or grocery store, get a

finger prick of blood taken and then get hundreds of tests run and the results returned a few hours later. Theranos was promising to revolutionize healthcare. It never happened.

Rise

Theranos grew quickly in the years following its founding. It seemed that everyone wanted to get in on Theranos; Elizabeth Holmes was even able to persuade many influential public figures to join the business. The Theranos board included James Mattis, who later became Secretary of Defense. Other prominent political figures including two former Secretary of States in George Schultz and Henry Kissinger as well as future Secretary of Education Betsy DeVos also invested or were otherwise tied to the company. Among other key investors were the Walton Family (heirs of the Walmart corporation), Rupert Murdoch (founder/CEO) of Fox, both of whom reportedly invested north of \$100 million in the company (Carreyrou et al., 2016). The company capitalized on investors caught up in Theranos' hype and who didn't want to miss out on being able to invest in "the next big thing" in Silicon Valley.

At its peak in 2014, the company was valued at \$9 billion and its founder and CEO Holmes was valued at more than \$4 billion, making her, at the time, the world's youngest self-made female billionaire (Loria, 2014). Notably though, the list of investors was very short on industry experts or those with a lot of experience investing in the health and medicine or technology fields. Additionally, the company was very popular with the media. Theranos received glowing news coverage in the leadup to its demise, and its founder Holmes was featured on the cover of publications like Fortune and Forbes.

Behind the Scenes

Behind the scenes the state of the company and its technology was far from the rosy picture painted to the media and investors. The company's principal product was a blood-testing

device nicknamed “the Edison”. While the details of how the device worked were fiercely protected by Theranos under the guise of intellectual property and trade secrets, the truth was that the engineers and scientists were privately struggling to make the device work as intended. While publicly Holmes touted the ability of Theranos devices to run over 200 tests on a single drop of blood, in reality their devices could only run 12 and those had routine quality control issues. When investors or important people came to tour Theranos labs they would make a show of getting them tested using the Theranos Edison device. They went as far as to stage a fake lab when then Vice-President Joe Biden toured a facility in 2015 (Carreyrou, 2018). In reality though these samples were simply removed from the devices and then hand-tested by lab-assistants using commercially available equipment. Theranos went to great lengths to hide this from investors and the public and had a very secretive culture that pressured employees into staying quiet. Startups often hide behind the guise of protecting intellectual properties or trade secrets as a defense for not being transparent about either their finances or the state of their technological development. Theranos was no exception. This attitude makes it hard for investors or journalists attempting to validate claims.

Fallout and Impact

While trouble had been simmering internally for a while, the first outward sign of trouble came in October 2015 when Wall Street Journal investigative journalist and reporter John Carey published a damning series of articles which called into question the quality of Theranos’ test results as well as many of the company’s most optimistic and highly touted claims. Initially Theranos was defiant in response to the bombshell article with Holmes appearing on CNBC’s Mad Money to refute the claims to say “This is what happens when you work to change things, first they think you're crazy, then they fight you, and then all of a sudden

you change the world.” (Loria, 2015). Even in the face of what seemed to be the inevitable downfall of her company she minimized legitimate criticism by invoking the belief that Silicon Valley disruptors are simply doing critical work to improve the state of the world, and that critics simply haven’t caught up yet.

But this attitude did not last long and things quickly turned for the worse for the company. By July 2016 the Centers for Medicare and Medicaid Services (CMS) had banned Holmes from owning, operating, or directing a blood-testing service for a period of two years. Theranos continued in a downward spiral. Walgreens soon ended its partnership with Theranos. In June 2018 founder Elizabeth Holmes and Theranos Chief Operating Officer and president Sunny Baldwani were both indicted on nine counts of wire fraud and two counts of conspiracy to commit wire fraud for allegedly defrauding investors, customers and patients. In September 2018 the company announced that it would be formally dissolving.

The disastrous consequences of Theranos’ actions were widespread. In the eventual fallout millions of Theranos blood tests were voided. Patients had reported getting dramatically inaccurate test results with huge impact. A pregnant woman’s test mistakenly indicated that she might be suffering from a miscarriage (Khorram, 2021). A man’s results incorrectly told him that he had tested positive for HIV (Khorram, 2021). It’s hard to overstate the emotional damage or potential medical implications that could result from these types of faulty results. Aside from the impact on real patients, the company’s culture also had a huge impact on its employees, especially those who were pressured and bullied by the company and those who took on the nearly impossible task of bringing the company’s lies to light.

Verdict and Implications

On January 3rd, 2022 Elizabeth Holmes was found guilty of defrauding investors of hundreds of millions of dollars by a California jury. It should be noted that Holmes was not found guilty of defrauding patients who were arguably most affected and endangered by receiving faulty results. Some hope this will act as a warning sign to other startups of what is not acceptable and will usher in a new era in the startup world. New York Times writer David Streitfeld opined “In Silicon Valley, where the line between talk and achievement is often vague, there is finally a limit to faking it” (Streitfeld, 2022). Meanwhile Silicon Valley critics say her conviction doesn’t mean much. They fear that Silicon Valley will use Theranos as a scapegoat instead of a signpost of broader problems and that “Fake It Till You Make It” culture will long outlive Theranos.

Bad Apples or Bad System

In the wake of the Theranos scandal many quickly pinned the blame on Holmes and Balwani as largely responsible for harm caused by Theranos. While there is little doubt that they acted in bad faith and knowingly lied and misled to detrimental results, framing the scandal as a failure of individual integrity minimizes the impact of systemic failures on multiple levels. This was less a situation of bad actors manipulating a good system, but more so an inevitable failure of toxic cultures and flawed systems. Many investors were inexperienced in the healthcare and technology industries and failed to properly vet Theranos. The media and many outlets covering Theranos were sold by Theranos’ story and failed to properly investigate Theranos’ claims and instead provided undeserved glowing coverage, giving unearned credibility to the company. Regulators failed to prevent Theranos from giving inaccurate results to real patients. The many

failures highlighted by Theranos' downfall highlight the need for systemic changes to Silicon Valley's structures and culture.

Disruption and Hypergrowth as a Business Model

Like many other Silicon Valley startups, Theranos was laser-focused on growth at all costs. Theranos aimed and promised not only to succeed in its own right but to disrupt a multibillion dollar industry and change healthcare (and the world) for the better. However, this unrelenting pursuit of scale and ambitious vision meant that the company didn't slow down enough to solidify its technology for fear of losing momentum or potential investors. While this preoccupation with growth and scale might have been appealing to investors it was unsustainable for Theranos and ended in ethical dilemmas and immense harm to patients.

A term recently coined to describe this strategy of growth is "blitzscaling" (Kuratko et al., 2019). New startups try to grow at hyperfast speeds in order to disrupt industries and capture new markets, but this growth has its limits and its pitfalls. Rapid growth is needed to lure in more investors and keep the valuation rising, often for long before making a profit or even bringing a product to market. A company can often only stay afloat as long as it keeps growing in value and is able to bring in new investments. This can often lead to ethical dilemmas when companies find themselves pressured and unable to maintain these insane levels of growth. When Theranos found itself nearing deadlines it started misleading to try to save time.

In a 2009 interview with Business Insider Facebook founder Mark Zuckerberg described his company motto as "Move fast and break things" saying "Unless you are breaking stuff, you are not moving fast enough" (Blodget, 2009). Many startups and entrepreneurs in Silicon Valley have taken this now infamous mantra to heart. Making mistakes and causing ill effects however large is often viewed as the cost of success and the cost of innovation. In Silicon Valley there is

pervasive rhetoric of permissionless innovation which can be described by ... as “the notion that experimentation with new technologies and business models should generally be permitted by default ... innovation should be allowed to continue unabated and problems, if they develop at all, can be addressed later” (Thierer, 2021). There is a strong bias towards developing and adopting technologies which is mainly to the benefit of entrepreneurs and investors who reap the rewards of successes, but not the cost of failures. Far less attention is paid to the groups bearing the associated risks. Silicon Valley companies often overemphasize the importance of their own innovations and contributions and underestimate the potential harms of moving too fast and breaking too much.

Other Startups

Like Theranos, many other startups have been accused of overstating their successes and the state of their companies. One recent spin-out was Ozy Media, a digital media company which shuttered after it was exposed by the New York Times for touting business deals that it didn't have, misleading claims in its marketing, and even impersonating a YouTube executive in a call with potential investors (Smith, 2021). The Nikola Corporation, an electric car company which vied to compete with Tesla has also recently been embroiled in controversy with the company's founder and former CEO Trevor Milton recently being indicted on criminal fraud and securities fraud charges for “lying about nearly all aspects of the business” (Isidore, 2021). So it seems Theranos certainly isn't alone in its overambition and failures.

Theranos, not some outlier or extreme result, but rather a natural result of a flawed system. Startups require a certain level of ambition and optimism. After all they are often pitching the idea of something that doesn't yet exist. But they need to be realistic with themselves and their investors about what the future holds. Otherwise they are setting themselves

up for failure. Deception and misleading may save face in the near term but it only sets them up for a larger downfall later.

Startup “Successes”

While there are many failures in Silicon Valley, there are also many successes that inspire, but not without stipulations. For example, a recent Silicon Valley success story, Tesla has amassed a valuation of over half a trillion dollars since its founding in 2003 helping make its CEO, Elon Musk the richest person on the planet (Chaturvedi, 2022). However, despite this success, Tesla has long struggled with quality control and safety issues often attributed to growing pains as a byproduct of their rapid growth as a company. Tesla’s company culture is hyper fixated on innovation, growth, and increasing output, at all costs. Former employees described the toxicity of the company culture with one former manager describing it saying, “The worst part is the toxicity that Elon creates — unrealistic stretch targets without a realistic plan in order to achieve them” (Matousek, 2020). As a result of an overemphasis on growth and output, quality and safety have slipped through the cracks in many instances. For example, Tesla has recently recalled over 50,000 vehicles over their ‘Full Self-Driving’ software running stop signs and over 800,000 vehicles for a seat belt alert issue (Krisher, 2022)(McFarland, 2022). In August 2021, the United States’ National Highway Traffic Safety Administration began a formal investigation of Tesla’s autopilot program for a series of accidents involving Teslas on Autopilot or Traffic Aware Cruise Control hitting vehicles at emergency scenes (Gregg et al., 2021). Even when startups achieve relative success the culture of overambition and cutting corners and/or ethical boundaries continues to detrimental effect. Even for companies that have achieved success there is still a large cost to this success. Moving quickly to disrupt an industry often means not paying attention to the consequences and side effects of this disruption.

The Future of of Startups

It seems for the time being 'Fake It Till You Make It' is alive and well in Silicon Valley. Bloomberg journalist Parmy Olson predicts that this culture will live on after Theranos saying "the broader practice of selling the future is unlikely to change. The story of Elizabeth Holmes is captivating, but it is not representative of most startups that are continuing to capitalize on astonishing new levels of funding, however truthful they choose to be" (Olson, 2022). The start-up industry and culture continues to reward the people who push the most boundaries and who have the biggest and boldest ideas, even when they can't live up to them. Silicon Valley startups are selling visions instead of products. Silicon Valley startups need to find a balance between dreaming big and being grounded in reality; they can and should still be ambitious but they also need to be realistic, honest and transparent. There's no doubt that entrepreneurial startups will continue to rise and fall, but hopefully there will be a shift in how business is done, so unsuspecting consumers won't have to bear the costs of overambition. Companies must find a structure that supports growth and innovation while also maintaining a healthy culture and sets reasonable targets. Startups need to focus more on implementing viable solutions and less on outward successes. SEC regional director Jina Choi says that the Theranos story should be an important lesson for Silicon Valley: "Innovators who seek to revolutionize and disrupt an industry must tell investors the truth about what their technology can do today, not just what they hope it might do someday" (*SEC.Gov | Theranos, CEO Holmes, and Former President Balwani Charged With Massive Fraud*, 2018).

Sources

Avle, S., Lin, C., Hardy, J., & Lindtner, S. (2020). Scaling Techno-Optimistic Visions. *Engaging Science, Technology, and Society*, 6, 237–254. <https://doi.org/10.17351/ests2020.283>

Chaturvedi, A. (2022, April 15). *Elon Musk: World's richest man explained in numbers*. Business Today.

<https://www.businesstoday.in/latest/story/elon-musk-worlds-richest-man-explained-in-numbers-329978-2022-04-15#:~:text=Elon%20Musk%2C%20is%20not%20only,net%20worth%20of%20%24264%20billion>.

Blodget, H. (2009, October 1). *Mark Zuckerberg on Innovation*. Business Insider. Retrieved February 16, 2022, from

<https://www.businessinsider.com/mark-zuckerberg-innovation-2009-10?r=US&IR=T>

Carreyrou, J. (2018, May 18). *Theranos Inc.'s partners in blood*. The Wall Street Journal. Retrieved February 16, 2022, from

<https://www.wsj.com/articles/theranos-inc-s-partners-in-blood-1526662047>

Carreyrou, J., Siconolfi, M., & Weaver, C. (2016, July 8). *Theranos dealt sharp blow as Elizabeth Holmes is banned from Operating Labs*. The Wall Street Journal. Retrieved February 16, 2022, from

<https://www.wsj.com/articles/u-s-regulator-bans-theranos-ceo-elizabeth-holmes-from-operating-labs-for-two-years-1467956064>

Geiger, S. (2019). Silicon Valley, disruption, and the end of uncertainty. *Journal of Cultural Economy*, 13(2), 169–184. <https://doi.org/10.1080/17530350.2019.1684337>

Gregg, A., Duncan, I., & Siddiqui, F. (2021, August 16). Tesla Autopilot faces U.S. safety regulator's scrutiny after crashes with emergency vehicles. *Washington Post*.

<https://www.washingtonpost.com/business/2021/08/16/tesla-autopilot-investigation-nhtsa/>

Griffith, E. (2022, January 4). *Why Silicon Valley Can't Escape Elizabeth Holmes*. The New York Times. <https://www.nytimes.com/2022/01/04/technology/elizabeth-holmes-verdict.html>

Huddleston, T., Jr. (2016, May 20). *Theranos Has Thrown Out Two Years of Blood-Test Results*. Fortune. <https://fortune.com/2016/05/19/theranos-void-edison-results/>

Isidore. (2021, July 29). *Nikola founder Trevor Milton indicted for allegedly lying about "nearly all aspects of the business."* CNN.

<https://edition.cnn.com/2021/07/29/business/nikola-founder-trevor-milton-indicted/index.html#:~:text=The%20indictment%20alleges%20that%20from,electric%20and%20hydrogen%20Dp%20wered%20trucks.>

Jeske, M. (2020). Lessons from Theranos: Changing Narratives of Individual Ethics in Science and Engineering. *Engaging Science, Technology, and Society*, 6, 306–311.

<https://doi.org/10.17351/ests2020.411>

Kessler, S. (2021, October 7). Ozy Media and the Limits of "Fake it till you Make it." *The New York Times*. <https://www.nytimes.com/2021/10/02/business/dealbook/ozy-eric-ries.html>

Levina, M. (2016). Disrupt or Die: Mobile Health and Disruptive Innovation as Body Politics. *Television & New Media*, 18(6), 548–564. <https://doi.org/10.1177/1527476416680451>

Khorram, Y. (2021, September 21). *Former Theranos patient testifies blood test gave her false miscarriage diagnosis*. CNBC. Retrieved February 16, 2022, from

<https://www.cnbc.com/2021/09/21/theranos-test-gave-false-miscarriage-diagnosis-witness-testifies.html>

Khorram, Y. (2021, November 18). *Former Theranos patient testifies that a blood test at Walgreens came back with false positive for HIV*. CNBC. Retrieved February 16, 2022, from <https://www.cnn.com/2021/11/17/theranos-patient-says-blood-test-came-back-with-false-positive-for-hiv.html>

Krisher, T. (2022, February 1). *Tesla recall: 'full self-driving' software runs stop signs*. AP NEWS. Retrieved February 16, 2022, from <https://apnews.com/article/tesla-recall-full-self-driving-software-e23d252ac5164cb0e7af776625b15180>

Kuratko, D. F., Holt, H. L., & Neubert, E. (2019, October 25). *Blitzscaling: The good, the bad, and the ugly*. Business Horizons. Retrieved February 16, 2022, from <https://www.sciencedirect.com/science/article/pii/S0007681319301478>

Loria, K. (2014, September 29). *This woman's revolutionary idea made her a billionaire - and could change medicine*. Business Insider. Retrieved February 16, 2022, from <https://www.businessinsider.com/theranos-founder-elizabeth-holmes-is-a-billionaire-2014-9>

Loria, K. (2015, October 15). *Theranos founder was 'personally shocked' about the story slamming her company today*. Business Insider. Retrieved February 16, 2022, from <https://www.businessinsider.com/elizabeth-holmes-fires-back-at-her-critics-2015-10>

McFarland, M. (2022, February 4). *Tesla recalls 817,000 vehicles due to seat belt alert issue*. CNN. Retrieved February 16, 2022, from <https://www.cnn.com/2022/02/03/business/tesla-recall-seat-belt-reminder-alert/index.html>

Matousek. (2020, February 20). *Ex-Tesla employees reveal the worst parts of working at the company*. Business Insider.

<https://www.businessinsider.com/ex-tesla-employees-reveal-the-worst-parts-of-working-there-2019-9?international=true&r=US&IR=T#the-toxic-environment-elon-musk-creates-1>

Olson, P. O. (2022, January 5). ‘Fake It Till You Make It’ Will Live On After Theranos.

Washington Post.

https://www.washingtonpost.com/business/fake-it-till-you-make-it-will-live-on-after-theranos/2022/01/04/555ad7ea-6d91-11ec-b1e2-0539da8f4451_story.html

Paul, K. (2022, January 14). *Elizabeth Holmes to be sentenced nine months after guilty verdict*.

The Guardian.

<https://www.theguardian.com/technology/2022/jan/13/elizabeth-holmes-sentence-september-fraud>

Pfotenhauer, S., Laurent, B., Papageorgiou, K., & Stilgoe, A. J. (2021). The politics of scaling.

Social Studies of Science, 52(1), 3–34. <https://doi.org/10.1177/03063127211048945>

SEC.gov | Theranos, CEO Holmes, and Former President Balwani Charged With Massive Fraud. (2018, March 14). SEC.

<https://www.sec.gov/news/press-release/2018-41#:~:text=%E2%80%9CThe%20Theranos%20story%20is%20an,hope%20it%20might%20do%20someday.%E2%80%9D>

Smith, B. (2021, November 3). *Goldman Sachs, Ozy Media and a \$40 Million Conference Call Gone Wrong*. The New York Times.

<https://www.nytimes.com/2021/09/26/business/media/ozy-media-goldman-sachs.html>

Streitfeld, D. (2022, January 4). *The epic rise and fall of Elizabeth Holmes*. The New York Times. Retrieved April 20, 2022, from

<https://www.nytimes.com/2022/01/03/technology/elizabeth-holmes-theranos.html>

Thierer. (2021, January 22). *Embracing a Culture of Permissionless Innovation*. Cato Institute.

<https://www.cato.org/cato-online-forum/embracing-culture-permissionless-innovation>