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Elizabeth Holmes and the Rise and Fall of Theranos Inc.

> *"Hyping your product to get funding while concealing your true progress and hoping that reality will eventually catch up to the hype continues to be tolerated in the tech industry."*[1]
>
> **– John Carreyrou, Author of *Bad Blood: Secrets and Lies in a Silicon Valley Startup*, in 2019**
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> *"You'll get knocked down over and over and over again, and you get back up. I've been knocked down a lot, and it became really clear that this was what I wanted to do, and I would start this company over 10,000 times if I had to."*[2]
>
> **– Elizabeth Anne Holmes, Former CEO and Chairperson, Theranos Inc. in 2015**

In June 2019, Elizabeth Anne Holmes (Holmes), former CEO and Chairperson of Theranos Inc. (Theranos), a US-based healthcare startup that offered blood testing for medical investigations, and Ramesh Balwani (Balwani), its former President and COO, were indicted by a federal grand jury of the US on charges of wire fraud and conspiracy to commit wire fraud. They were indicted for distributing falsified blood test reports to consumers. Holmes and Balwani were to go on trial in August 2020, and could face up to 20 years of imprisonment if the charges against them were proved. Not too long ago, Theranos was being identified as a revolutionary company and Holmes was being widely celebrated as a leader and the youngest female self-made billionaire.

Holmes launched a blood testing device in 2005 and named it *"Theranos 1.0"*. The device was designed in such a way as to perform a number of blood tests on a drop of blood collected from a finger pinprick. It was aimed at making blood testing more accessible, affordable, and less painful. However, the device had some technical flaws and scientists at the company raised objections against it.[3] Holmes then refurbished the device and also launched a new one named *"Edison"* in 2007. Theranos entered into a partnership with Walgreens Company (Walgreens), the second largest pharmacy store chain in the US, in 2009 and supermarket chain Safeway Inc. (Safeway) in 2010, whereby both companies agreed to stock Theranos's devices in their outlets. In 2011, Theranos came up with another device and named it *"miniLabs"*. Holmes managed to attract investments worth US$700 million by 2014. As the wealthiest female entrepreneur in the US, she appeared on the cover pages of Forbes and Fortune magazines. Her net worth was US$5 billion in 2014.

By 2014, Theranos was being regarded as the healthcare startup darling of Silicon Valley, and enjoyed a market valuation of US$9 billion in 2014. Its initial value proposition of offering blood testing for medical investigations using a finger prick sample of blood was considered revolutionary in the field of healthcare then. Holmes asserted it was better than the conventional methods of blood-testing and also a lot less expensive. Theranos claimed its blood testing device could accurately run at least 200 blood tests on a single finger prick sample of blood. According to John Carreyrou (Carreyrou), the Wall Street Journal (WSJ) reporter who investigated Theranos, *"Theranos founder Elizabeth Holmes epitomized Steve Jobs, which attracted Silicon Valley investors who didn't look too closely at the health company's claims."*[4]

In mid-2014, however, Theranos's smooth journey hit a huge roadblock. Whistleblowers inside the company revealed alleged unethical and deceptive practices at Theranos. In their interviews to different sources, they alleged that Holmes and her close confidante Balwani had harassed the scientists at the company and other staff members who questioned the miniLabs technique. They also alleged that the scientists at Theranos were compelled to test blood samples using traditional methods but to publish reports that the samples had been tested on miniLabs. They alleged that the blood samples, which were taken as a pinprick of blood, were diluted so that they could be tested by conventional methods which needed a larger volume of blood.

The allegations resulted in partnerships with both Walgreens and Safeway coming to an end in 2015, and subjected the company to a number of lawsuits from business partners, investors, and customers. In 2016, Holmes and Balwani were charged with fraud by different federal agencies in the US. As Theranos became defunct in September 2018, analysts wondered how Holmes had been able to pull off such a massive deception for more than ten years. The alleged fraud also raised critical questions: Is it necessary for entrepreneurs to lie or stretch or twist the truth to gain legitimacy in order to acquire the resources needed for their firm's survival and growth? Should startups be held to the same standards as we now hold the most mature public companies? With Holmes and Balwani being indicted for *"massive fraud",* do the alleged lies by Holmes even qualify as legitimacy lies?

HOLMES AND HER EXPERIMENTS

Holmes, a 19-year-old dropout from Stanford's chemical and electrical engineering department, founded Theranos in 2003. It was then called *"Real-Time Cures".* She was fascinated by her grandfather's medical career and her summer internship at the Genome Institute of Singapore in 2003 only heightened her interest in the field. Shortly after the internship, Holmes wrote an application for an arm patch that had the ability to diagnose and treat medical conditions. Although she patented the application, she did not commercialize it.

Holmes was joined by Shaunak Roy, a PhD student whom she had assisted during her university days. She also hired her Professor from Stanford as an advisor to the company board in 2003. Holmes took on the position of Chairperson and CEO in the company. For the initial funding of Theranos, Holmes used her family connections. In 2004, Theranos raised US$ 6.9 million in its first round of funding and had a valuation of US$ 30 million. It had its headquarters at Palo Alto, California, USA, where it established its clinical laboratories (Labs) in 2003.

Theranos aspired to design devices that could be used to perform a wide range of lab tests using a finger-prick blood sample. The initial design for its device in 2005 was a cartridge and reader system which was designed with the help of microfluidics and biochemistry. Holmes named it the *"Theranos1.0"* and looked forward to licensing out the technology in 2006 to pharmaceutical firms for clinical trials. However, things didn't go as per plan. Starting November 2006, Theranos's employees began questioning the reliability of the *"Theranos 1.0".* In August 2007, however, Holmes tested the *"Theranos 1.0"* technology on terminal cancer patients in Nashville. But due to a lot of noise inside the company, she was forced to go in for a redesign of the device.

In September 2007, the second prototype was created and was named the *"Edison"* The device was a modified version of a glue-dispensing robot from a company named *"Finsar",* based in New Jersey, USA. Holmes also approached Apple Inc. designers for architecting the overall look of Edison. She said, "*We tried everything else and it failed, so let's call it the Edison, when naming the prototype in 2007. We code-named our product the Edison, because we assumed we'd have to fail 10,000 times to get it to work the ten-thousandth-and-first. And we did.*"[5]

Tryst with *"Edison"*

The Edison's robotic arm took the place of a chemist in a real-life lab. The arm would take samples, dilute them, add antibodies and a reagent, and reveal the result.[6] It used a *"nanotainer"* (a small device designed to draw, retain, and analyze a droplet of blood from a patient's fingertip).

Theranos also claimed that the Edison could run multiple tests on a patient's physiology within minutes and at a lower cost than the technology available then in blood testing.[7] Holmes asserted that her device was more efficient in testing for life-threatening diseases like cancer and diabetics.

Managing Investors

By the end of 2007, the company had raised another US$ 43.2 million, and its valuation stood at US$ 197 million. Holmes used the investors' money to fund her experiments. In 2008, industry observers began comparing Holmes with geniuses like Archimedes and Beethoven. Holmes was successful in attracting investors with her convincing spiel about the product, though she did not give clear details about it. Described as an enigmatic and young leader by journalists at that time, she was successful enough to amass a network of high-profile backers to help fund the company, and enlist support from powerful people.[8] She spoke so passionately about how she aimed to revolutionize blood-testing in the US and the world that she managed to win the trust of many world leaders like Henry Kissinger (Kissinger), former US Secretary of the state; Bill Clinton, former President of the US; renowned economist George Shultz (Shultz), who had previously led the US departments of Labor, State, and Treasury as well as the Office of Management and Budget; and global luminaries like Lawrence Joseph Ellison, Chief of Oracle Inc.; and Bill Gates, former CEO at Microsoft Inc.

Theranos's influential board of directors included Shultz and Kissinger. Shultz believed so deeply in Theranos that he even recommended to his grandson, Tyler Shultz (Tyler), to intern at the healthcare startup. By 2014, the independent directors also included William Perry (former US Secretary of Defense), Sam Nunn (former US Senator), Bill Frist (former US Senator and heart-transplant surgeon), Gary Roughead (Admiral, USN, retired), James Mattis (General, USMC), Richard Kovacevich (former Wells Fargo Chairman and CEO), and Riley Bechtel (chairman of the board and former CEO at Bechtel Group).

Holmes's speeches reminded people of the aura of the late Steve Jobs. She exuded a sense of authority and responsibility in her speeches and consciously tried to portray this association with Jobs in her interactions with media and investors. Observers noted that Holmes was obsessed with Jobs and went to great lengths to look and act like him. She was also famous for her deep baritone (which she considered as her weapon in exerting control in the male dominated entrepreneurial world), her Steve Jobs like mannerisms, and the way she dressed – all in black and turtlenecks – at the company AGMs and at press conferences.

Holmes spoke of how she had been scared of needles since her childhood and how Theranos's project was close to her heart.[9] She won Forbes magazine's award for the youngest and wealthiest self-made female billionaire of the US in 2009.[10] In 2014, she was ranked 110 on the Forbes 400 and cornered the No. 1 spot on Forbes magazine's list of *"America's Richest Self-Made Women"* in 2015 with a net worth of US$4.5 billion.

Partnerships

In September 2009, Holmes was joined as partner by Balwani, whom she had known since her Stanford days. Balwani had a programming and business background and was designated President and COO at Theranos. Both Holmes and Balwani began scouting around for partnerships and approached Walgreens, which agreed to stock a few Edison systems at its stores. By 2010, Theranos was valued at US$1 billion, with multiple series of funding.[11] It raised US$45 million by selling equity, options, warrants, and other security rights.[12]

In 2010, Safeway agreed to build clinics in more than 800 of its stores to offer blood tests by Theranos. The deal was valued at US$ 350 million.

In 2011, Holmes modified the device and named it the *"miniLabs"*. The miniLabs was nicknamed *"4s"* after Apple Inc's iPhone model 4s. In 2012, Theranos attempted a beta-run at a Safeway employee clinic. Though the medical officer at Safeway raised concerns about the authenticity of the medical reports issued by the Theranos device, the Safeway management dismissed them. Theranos continued testing on its devices.

In 2012, the miniLabs were installed at Walgreens stores as well. Walgreens had developed wellness centers with Theranos's products at Arizona and California. At one point, it hosted about 40 Theranos blood-testing centers. In mid-2012, Theranos also approached the military for deployment of its machines at their military installations. That invited a Food and Drug Administration (FDA)'s enquiry into Theranos, as its technology was questioned by Lieutenant Colonel David Shoemaker (Shoemaker) of the US Army. Following the FDA, the Center for Medicaid and Medicare Services (CMS) – the federal agency at the US Department of Health and Human Services – also initiated a surprise inspection. However, with some persuasion, CMS and Shoemaker agreed to a limited number of tests being conducted on military staffs.

Theranos launched its website in September 2013 and publicly introduced its 4s model to the world. The launch was done despite objections and concerns voiced by Theranos's own scientists that the device and the technology were not ready.

Theranos continued securing investments and became the talk of Silicon Valley. It was valued at US$ 9 billion in February 2014. In 2014, Theranos and Holmes garnered a lot of media attention and Holmes even featured on the cover of Fortune, the same year.

THE DARK TRUTHS ABOUT THERANOS

Uncovering the Reality at Theranos

Holmes and Balwani raised US$ 700 million between 2013 and 2015 from investors on the promise of coming out with a revolutionary blood testing technology. That technology did not materialize. They generated funds between 2013 to 2015 through an *"elaborate, years-long series of lies and exaggerations about the company's business, finances, and technology".*[13] Holmes had promised her machine could do 200 tests. In reality, it could perform just a handful. For the vast majority of its tests, Theranos used equipment already available in the market. But Holmes seemed to have lied to the investors about the fact.[14]

When faced with occasional criticism, such as some medical experts opining that blood from a finger-prick may not be as pure as the traditional vein sample as the blood became mixed with fluids from tissues and cells, Holmes dismissed these as a conspiracy against Theranos by the powerful lab testing and diagnostic companies.

Theranos also reportedly faked demonstrations while striking a deal with Walgreens and Safeway stores in July and August 2013. While giving demonstrations for the miniLabs' store launch, Holmes reportedly told her employees to put Theranos's equipment in the blood-testing room (where they collected blood samples from the executives). It was alleged, however, that instead of processing the blood tests on the Theranos machines, the employees *"secretly"* ran some of the tests on conventional lab equipment. The reports presented to the Walgreen and Safeway management were, thus, from the regular lab testing equipment and not from the miniLabs of Theranos.[15]

The investors were also given falsified information on clinical trials that Theranos had supposedly run with pharmaceutical companies.[16] Holmes told multiple investors that Theranos's technology had been deployed by the US Department of Defense on the battlefield in Afghanistan and on medevac helicopters that transported casualties. However, Theranos's technology was actually used in a Department of Defense burn study, not on the battlefield in Afghanistan or on medevac helicopters.[17]

Theranos allegedly lied to the investors that it was on the verge of generating revenues of more than US$ 100 million and breaking even in 2014, and that it was on track to generate US$ 1 billion in 2015. The company, in fact, had just over US$ 100,000 in revenue in 2014, and was far from generating the painted revenue figure. From 2013 to 2015, Holmes repeatedly told potential investors that Theranos did not need to get FDA approval for its equipment and tests, but was voluntarily applying for it anyway because it was the *"gold standard."*[18]

But in late 2013 and throughout 2014, the FDA had informed Holmes that approval was necessary. In 2013, Holmes had submitted Theranos's tests to the FDA for clearance, while raising money and telling investors that the process was voluntary. Theranos organized press and media conferences and explained its technology many times over between 2013 and 2015.

Whistleblower's Revelations

In 2014, Tyler who had been working as an intern at Theranos for some time, decided to come out into the open regarding allegedly unethical practices at Theranos. In April 2014, he wrote an e-mail to Holmes complaining that Theranos had doctored research and ignored failed quality-control checks. Holmes forwarded the mail to Balwani and the latter ridiculed Tyler's knowledge of mathematics and Lab science. Balwani also hinted that as Shultz's grandson, he was safe in the company despite his complaint mail.[19] Later in the day, Holmes even called Tyler's family to warn them against letting Tyler go ahead with his intentions of launching what she called a vendetta against Theranos. After those events, Tyler resigned from Theranos.

Tyler was the first whistleblower at Theranos. He was 26 years old at that time. He said, "*There are only a few cases that I know of where some actually did raise concerns to the level of Elizabeth or Ramesh, and they were pretty much fired right on the spot, no one was motivated to speak up. Their culture of fear worked for them for a long time.*"[20] After resigning from Theranos, Tyler contacted New York State's public-health Lab in 2014 and alleged the company had manipulated a process known as proficiency testing, relied on by federal and state regulators to monitor the accuracy of Lab tests. That was the first official regulatory complaint about Theranos's lab practices.[21] However, Theranos accused Tyler of leaking trade secrets and violating an agreement of not disclosing confidential information pertaining to the company.

In February 2015, Tyler received a LinkedIn message from Carreyrou, a WSJ investigative reporter, who had received a tip from other reporters about mis-governance at Theranos. According to Tyler, "*I knew Theranos was going to be hard to take down and so I wanted to see if he was going to be able to do it before I was going to put myself on the line. When I called him (Carreyrou), I basically asked him what he knew. And he was very open with me, which was really surprising because no one was open about Theranos at that time. I was surprised at how much he knew.*"[22] Tyler agreed to be a confidential source for Carreyrou in early 2015, and helped the journalist with his reporting on Theranos.

The developments against Theranos came to Holmes's attention and she deduced that Tyler had become a tipster. She informed Shultz, who then called Tyler. After a series of heated meetings between Theranos and Tyler, Theranos's lawyers tried to pressure Tyler to sign a confidentiality agreement and an affidavit saying he hadn't spoken to the press. Tyler, however, consulted his grandfather's lawyer, who then set him up with another legal team. Tyler's legal costs totaled more than US$ 400,000 (as of 2019).[23]

In the latter part of 2015, Carreyrou further contacted a former Lab director (name undisclosed) at Theranos, who discussed the unethical and harmful practices that were taking place at the company. He revealed that the Edison too came with its own flaws – pieces of the machine would fall off, the doors wouldn't close, and the device couldn't properly regulate its temperature. Holmes drove the engineers to work tirelessly to figure out solutions, and anyone who tried to raise concerns about Theranos's or her own methods were dismissed or fired at will.[24] The former Lab director also revealed that Theranos had been generating false and unreliable results for patients. He added that Theranos had planned to test for HIV, and that he had objected to that during his tenure and even had arguments with Holmes and Balwani.

In 2015, while investigating further, Carreyrou contacted Erika Cheung (Cheung), a graduate of the University of California, Berkeley, who worked as a chemist at Theranos. Within a month of working there, she noticed anomalies in the thyroid tests results of a patient, with three different sets of results being given for the same sample of blood! Apart from that, she also noticed

Theranos was experimenting on patients without their knowledge or consent, making them believe their tests were being done before a well-trained doctor. Cheung too approached Holmes and Balwani, but they reportedly did not care about the anomalies. It was then that Carreyrou approached Cheung. She interviewed with Carreyrou and revealed the malpractices at Theranos and became another whistleblower after Tyler and the former Lab director.[25]

Cheung too received similar treatment as Tyler and was even followed by investigators of private agencies hired by Theranos post her interview with Carreyrou. Carreyrou recalled, "*They (Theranos) went on a witch hunt and came after a whole bunch of prior employees. It wasn't just the threat of being sued that alarmed Cheung, it was the fact that she discovered she was being physically followed. The matter came to a head one evening when colleagues noticed a man in a car outside where she worked and, when confronted, he handed her a legal letter that had the address of the apartment where she was staying.*"[26] Post such developments, Cheung sent an e-mail to CMS, which in turn began investigations that led to the unravelling of Theranos's activities in public.

According to Carreyrou, Tyler and Cheung had intimated to the Theranos board that Holmes had exaggerated revenue projections. When the board considered replacing her with an experienced executive, she not only convinced them to let her continue but also increased the voting rights of her shares to give herself 99% of total votingrights.[27]

Malpractices Reported in Public

Carreyrou published his first story on Theranos and its struggles to develop a blood-testing device in 2015. Just after the publication, Holmes organized a press conference, which was aired on television, about the company's activities and defended Theranos's techniques. Holmes's claim that the *"miniLab,"* could screen for multiple diseases using just drops of blood obtained by a prick of the finger, had become the selling point for needle-phobic individuals. Theranos also stressed that tests conducted on its device were more accurate, more reliable, and faster than the conventional blood tests. The device had the potential to revolutionize the way diseases were screened and tested, it claimed. Holmes maintained that powerful companies who did not want her revolutionary product to succeed were after her.

By 2015, facts started spewing out. The FDA found that Theranos was shipping an *"uncleared medical device"* to various Walgreen and Safeway stores in and around the US. Theranos had allegedly made various fraudulent efforts to hide its product's flaws. The FDA and the regulators also found that Theranos often used industry-standard Siemens Inc. machines instead of its own miniLab for conducting tests. To test pinpricks of blood, they first diluted the contents to produce a big enough sample for the Siemens devices to run the tests. Sometimes they simply drew blood the old-fashioned way. The Theranos blood tests that were rolled out at Walgreens in Arizona had reportedly put hundreds of patients at risk of receiving inaccurate results of false negatives that failed to catch a dangerous condition. There were even cases of false positives reported that resulted in people having to undergo costly and unnecessary tests and procedures![28]

It was widely reported that the culture at Theranos demanded the utmost loyalty of its employees and any kind of dissent was not tolerated. Many employees knew that the financial forecasts that Balwani had given investors were ten times that of internal figures, but they kept quiet as they feared retaliation from Holmes and Balwani. Former employees described Holmes as highly manipulative and said that employees who did not toe the company line were subjected to flare-ups and heightened surveillance from the ill-tempered and much-feared Balwani. Those who agreed with Holmes got promoted; those who disagreed were fired.

In September 2016, it was reported that Ian Gibbons, a head scientist at Theranos and an award-winning scientist who was struggling to make the company's blood test machines work, had committed suicide in May 2013 amid fears that Holmes was about to fire him.[29] He had been subpoenaed by the court and reportedly feared that anything that he would say would put Theranos in jeopardy.

THE DOWNFALL OF THERANOS

When the damning WSJ report was published, Holmes went into damage control mode and claimed that all the accusations against Theranos were false, and that her company had supplied over 1,000 pages of documentation that disproved the allegations. *"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,"*[30] she quipped.

Concerned over the allegations and misrepresentations, Safeway withdrew from its partnership with Theranos in 2015; Walgreens too hesitated to continue stocking Theranos's devices in its stores. In January 2016, CMS expressed concern over the Theranos Lab results and said they posed an immediate threat to patients. Based on these concerns, the Security and Exchange Commission (SEC), an independent agency for enforcing federal securities laws and regulations in the US, began its investigation into the company in April 2016. It was against this backdrop that Theranos announced the setting up of its own medical advisory board, which included past presidents or board members of the American Association for Clinical Chemistry.[31]

In May 2016, Balwani left the company and Holmes alone continued as its Chairperson and CEO. In June 2016, Walgreens ended its partnership with Theranos and closed all its wellness centers in Arizona and California. The US Attorney's Office for the Northern District of California charged Holmes with nine counts of wire fraud and two counts of conspiracy to commit wire fraud on the grounds that she had made false claims about the blood-testing device to investors, doctors, and patients in 2016.[32]

In 2016, Walgreens filed a lawsuit against Theranos seeking US$140 million to recover what it had invested in the partnership (the lawsuit was reportedly settled for less than US$30 million). Safeway broke off its deal after spending US$350 million on building clinics for Theranos's tests in more than 800 supermarkets; Theranos never ran any tests at the Safeway stores.

In July 2016, CMS banned Theranos from the lab-testing industry for two years. However, Holmes settled the ban with CMS by paying a fine of US$ 30,000. As a settlement clause, Homes agreed that Theranos would not own or operate a clinical lab until 2019.

In 2016, Partner Fund Management, a San Francisco-based hedge fund, sued Holmes and Theranos for *"fraudulently inducing"* the investment through *"a series of lies, material misstatements, and omissions".*[33] *"Not only did they fool the investors, they fooled patients, they fooled doctors,"*[34] quipped Reed Kathrein, a partner at Hagens Berman who sued Theranos on behalf of investors. A number of ex-customers of Theranos sued the company claiming that an inaccurate test had changed their lives.[35]

A cluster of lawsuits were filed by investors, affected patients at Arizona, Walgreens, and Safeway, against Theranos. Theranos paid in millions to settle all the piled-up lawsuits and complaint redresses. Board members began leaving the company one after the other. Layoffs at the company too continued at a random pace. In 2016, Theranos shut down its Labs and laid off 340 employees. In 2016, it initiated a test for the Zika[a] virus disease but later stopped the test after the FDA found that it did not include proper safeguards.

Between 2016 and 2017, Theranos spent a huge amount of cash on settling pending lawsuits filed by different patients. At the end of 2017, requiring heavy cash infusion, it entered into a deal with Fortress Investment Group (Fortress) for US$100 million in secured debt financing. It had managed to clinch the deal by citing its research and testing on the Zika virus.

[a] The Zika virus is similar to the dengue fever, yellow fever, and West Nile virus. It is carried by infected *Aedesa aegypti* mosquitos, Zika is largely transmitted through bites, but can also occur through intrauterine infection.

In March 2018, the US's SEC charged Holmes, Balwani, and Theranos with *"a massive fraud".* It also claimed Theranos's ex-president Balwani had lied for years about the company's technology and fooled investors into giving Theranos hundreds of millions of dollars. Holmes and Balwani pleaded not guilty. Holmes, however, paid a fine of US$ 5 million to the SEC to settle the case of fraud against her and Theranos and agreed to the penalty imposed on her of not being allowed to be a director or officer of a publicly traded company for 10 years. Balwani, however, continued to appeal to the SEC against the charges.

Holmes stepped down as CEO from the company in June 2018 and Theranos was shut down in September 2018. Prominent investors who lost millions in the company included media baron Rupert Murdoch (US$125 million), US Secretary of Education Betsy DeVos (US$100 million), Mexican billionaire Carlos Slim (US$30 million), and members of the Walton family of Walmart heirs (US$150 million).[36]

THE VERDICT AND THE WAY AHEAD

According to the verdict of Edward J. Davila, judge of the US District Court for the Northern District of California, on June 30, 2019, Holmes and Balwani would officially go on trial for the charges against them in San Jose from August 2020. The trial was based on the documents and complaints from the defense presented to the court. Holmes and Balwani would face trial for 20 years in prison and a million dollars in fine starting the next year. Both Balwani and Holmes, had challenged the trial individually.[37]

Once treated as the greatest success story, Theranos's epic downfall caught the attention of the digital media and Hollywood. Entertainment channel HBO launched a documentary called *"The Inventor: Out for Blood"* in 2018, based on Theranos. The hour-long documentary depicted how Theranos had failed to live up to its own promise. As of 2019, filmmakers too were looking to make a film on the Theranos story. The film was likely to be produced by Adam McKay with Hollywood actress Jennifer Lawrence playing Holmes's character in the movie.[38] There was also a series named after Theranos in the digital media channel, Hulu, in the US.

According to scientists, in the urge to prove that she and her product were unique, Holmes had begun to believe her own lies and she succeeded in making the world too believe them – until the truth came out. Industry observers rued the fact that there were conditions prevalent in the industry that allowed such things to happen.

In the words of Carreyrou, "*The culture of Silicon Valley created the conditions for someone like Holmes to come along, to thrive. Holmes' grave error was to channel this culture, especially the fake-it-until-you-make-it part. Applying such maxims to a medical product with life-and-death implications was a key driver of the Theranos downfall. The technology simply couldn't deliver as promised*."[39]

End Notes:

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