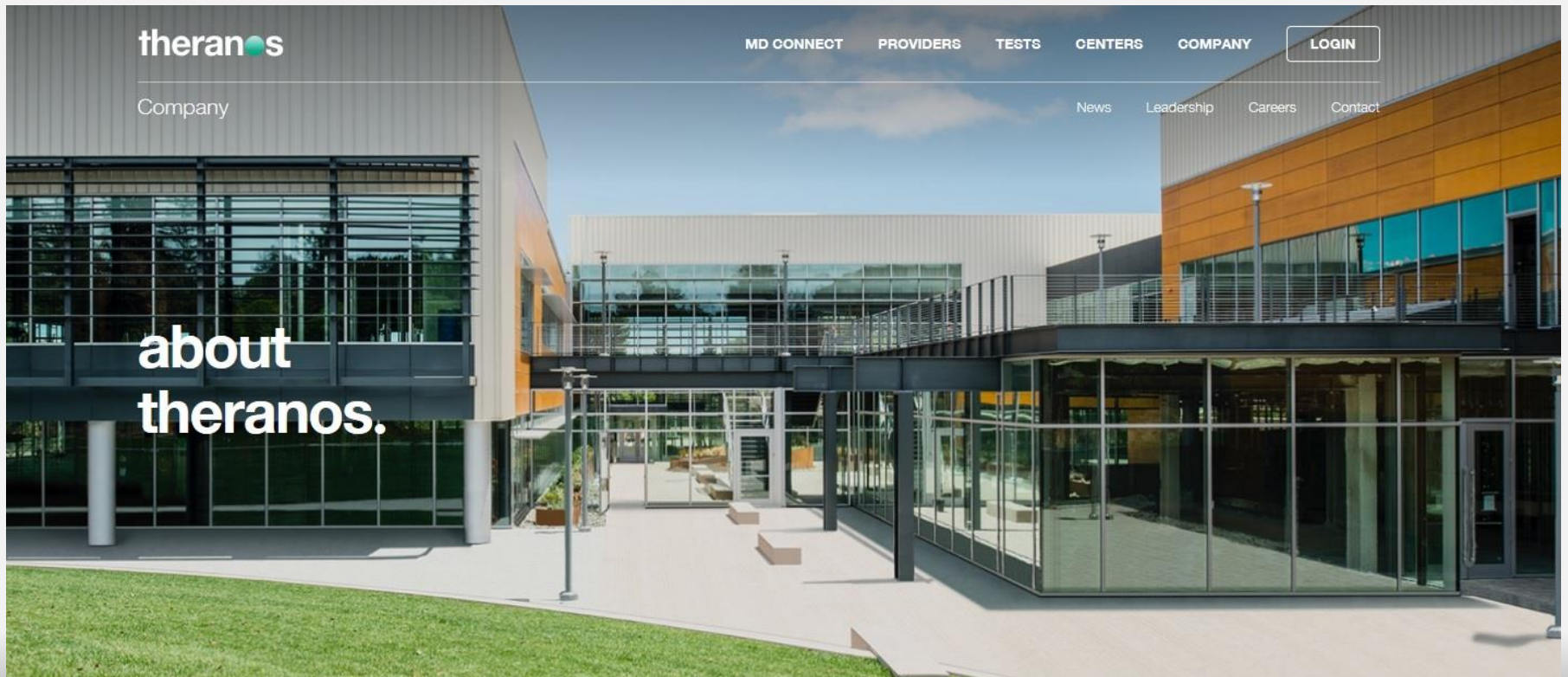


Theranos- Elizabeth Holmes

Dr. Jack M. Wilson

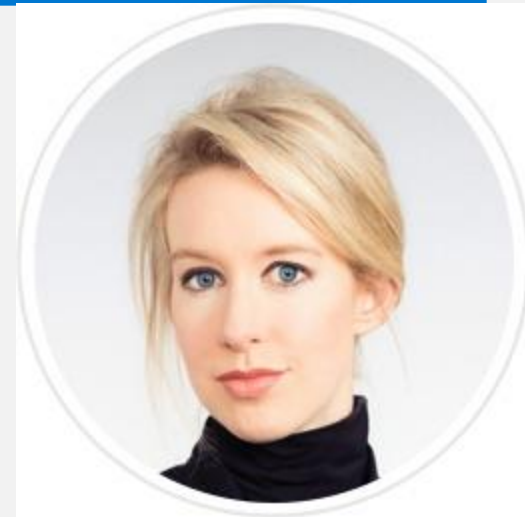
Distinguished Professor of Higher Education, Emerging Technologies, and Innovation



Readings:

- Wikipedia: <https://en.wikipedia.org/wiki/Theranos>
- Company: <https://www.theranos.com/company>
- Young Blood:
 - <http://www.economist.com/news/business/21656196-theranos-ambitious-silicon-valley-firm-wants-shake-up-market-medical>
- A second FDA approval frees Theranos to do a blood test outside lab:
 - <http://fortune.com/tag/theranos/>
- An Inside Look at the Theranos Direct to Consumer Experience:
 - <http://www.forbes.com/sites/danmunro/2015/07/13/an-inside-look-at-the-theranos-direct-to-consumer-experience/>
- Holmes is where the Heart Is.:
 - <http://www.economist.com/news/business/21656193-theranoss-boss-says-her-mission-extends-beyond-making-fortune-holmes-where-heart>
- “Hot Startup Theranos Has Struggled With Its Blood-Test Technology;” Wall Street Journal, Oct. 16, 2015
 - Silicon Valley lab, led by Elizabeth Holmes, is valued at \$9 billion but isn’t using its technology for all the tests it offers
 - <http://www.wsj.com/articles/theranos-has-struggled-with-blood-tests-1444881901>
- “The fable of the unicorn: A much-hyped medical startup is suddenly plagued with doubts;”
 - The Economist; Oct 31, 2015
 - <http://www.economist.com/news/business/21677192-fable-unicorn-theranos-much-hyped-medical-startup-plagued-doubts>
- “Regulators Propose Banning Theranos Founder Elizabeth Holmes for at Least Two Years;”
 - Startup hopes to avoid sanctions, but Holmes and No. 2 executive could be forced out of blood-testing business for failing to fix problems; Wall Street Journal; April 13, 2016.
 - <http://www.wsj.com/articles/regulators-propose-banning-theranos-founder-elizabeth-holmes-for-at-least-two-years-1460570869>
- “Theranos Under Investigation by SEC, U.S. Attorney's Office;” Bloomberg News; April 18, 2016
 - <http://www.bloomberg.com/news/articles/2016-04-18/theranos-is-under-investigation-by-sec-u-s-attorney-s-office>
- “Don’t Blame Silicon Valley for Theranos;” NY Times; Randall Stross; April 27, 2016.
 - http://www.nytimes.com/2016/04/27/opinion/dont-blame-silicon-valley-for-theranos.html?smid=fb-nytimes&smtyp=cur&_r=0
- “Craving Growth, Walgreens Dismissed Its Doubts About Theranos;” WSJ; May 25, 2016
 - <http://www.wsj.com/articles/craving-growth-walgreens-dismissed-its-doubts-about-theranos-1464207285>
- “After the Theranos Mess, Can We Finally Quit Idolizing Entrepreneurs?;” Fortune; May 27, 2016
 - <http://fortune.com/2016/05/27/quit-idolizing-entrepreneurs/>
- “Theranos CEO Elizabeth Holmes banned for two years from industry she aimed to transform;” STAT;
<https://www.statnews.com/2016/07/08/theranos-elizabeth-holmes-banned/>

- Elizabeth Holmes was majoring in Chemical Engineering at Stanford, but she was only 19 years old when she dropped out in 2003 to found what is now known as Theranos.
- Today Forbes Magazine estimated her worth at \$4.7 Billion
 - the worlds youngest female self-made billionaire.
- Her better idea: a way to build a medical laboratory on a chip. The chip could do hundreds of tests on one drop of blood -and do them quickly and cheaply.
- She pioneered offering tests directly to consumers.
- Theranos is privately owned and she still holds about 50% of the company.
 - Investors include Draper Fisher Jurvetson, ATA Ventures, Tako Ventures, Continental Properties Inc., and Larry Ellison, CEO of Oracle.
 - Advisors include Henry Kissinger and George Schultz -2 former Sec. of State.
 - \$16 million in two rounds of initial fundraising
 - \$28.5 million in a third round in 2006.
 - \$45 million from a single unnamed investor
 - total funding more than \$70 million



Competitors and Partners

- The dynamic duo own the market between them
 - LabCorp –public \$12 billion company
 - Quest –public \$10 billion company
 - Each offer 3000-4000 test to Theranos 250 and heading for 1000.
 - Some have questioned Theranos \$9 billion valuation in a private placement.
- Partners
 - Pfizer -use Theranos for clinical trial testing
 - GlaxoSmithKline -ditto
 - Cleveland Clinic –providing testing services for them
 - Walgreens –Arizona has legalized direct to consumer sales, and Theranos is in 40 branches as a pilot.

Problems

- “Elizabeth Holmes, a 31-year-old Stanford dropout who became a billionaire by starting the blood testing laboratory Theranos, is now waging a public battle to defend her reputation and that of her closely watched Silicon Valley company.”
- “Her campaign began shortly after two [articles published in The Wall Street Journal](#) last week questioned the accuracy of the company’s blood tests and the extent to which Theranos is using unique technology.”
 - http://www.nytimes.com/2015/10/22/technology/theranos-elizabeth-holmes.html?_r=0
- “The Wall Street Journal article last week, citing an unnamed former senior employee, said that as recently as December, Theranos was routinely performing only about 15 of the more than 200 tests it offered using its proprietary equipment, with the rest being performed on standard machines bought from laboratory equipment vendors.”
- “In its rebuttal, which Theranos plans to post on its website the company said that it performed more than 80 of the tests using its own technology that month. It said that 57 percent of customers in the fourth quarter of last year had blood drawn from a finger prick.”
- “Last week, the company said that it was not using finger pricks at the moment — except for the herpes test — because it was following F.D.A. advice that its “nanotainer,” the tiny tube that holds the blood from finger pricks, needed regulatory approval as a medical device. The company is now seeking that approval. But Ms. Holmes said that the need to get approval for the tube did not reflect on the accuracy of the machines that analyze the blood samples.”
- Wall Street Journal
 - <http://www.wsj.com/articles/theranos-has-struggled-with-blood-tests-1444881901>
- The fable of the unicorn: A much-hyped medical startup is suddenly plagued with doubts;”
 - The Economist; Oct 31, 2015
 - <http://www.economist.com/news/business/21677192-fable-unicorn-theranos-much-hyped-medical-startup-plagued-doubts>

The Plot Thickens

- It is bad enough when the Wall Street Journal gets on your case, but when the U.S. Securities and Exchange Commission and the U.S. Attorney's Office for the Northern District of California start criminal investigations, things are taking a pretty difficult turn for the worse.
 - <http://www.bloomberg.com/news/articles/2016-04-18/theranos-is-under-investigation-by-sec-u-s-attorney-s-office>
- *“The SEC polices whether disclosures made to investors are accurate. Chair Mary Jo White said last month that the civil agency is paying close attention to so-called unicorn companies --those startups whose valuations exceed \$1 billion --as more technologies become available to raise funding.”*
- *“A redacted inspection report released in March by CMS detailed a long list of shortcomings at the company's Newark, California, laboratory, including failures to meet quality-control standards, such as not keeping freezers at the temperatures required by manufacturers; lack of proper documentation and missing signatures on paperwork; and unqualified personnel. CMS said in late January that faults at the lab were so severe that they jeopardized patients' health.”*

On April 13, the Wall Street Journal reported that CMS took a further step to propose sanctions that could ban Holmes from the diagnostics business and stop the blood-testing startup from receiving payments from Medicare. Theranos said it has responded to CMS's concerns and is waiting to hear back from the agency. “

Valuing a start-up company –The Unicorn

- The fable of the unicorn: A much-hyped medical startup is suddenly plagued with doubts;”
 - The Economist; Oct 31, 2015
 - <http://www.economist.com/news/business/21677192-fable-unicorn-theranos-much-hyped-medical-startup-plagued-doubts>

“Yet in other ways Theranos evokes a central theme in today’s tech industry: startups which promise to disrupt lucrative businesses and become valued on the basis of fantasies about their potential, rather than present reality. Investors are so keen to get a piece of any sexy-sounding startup that they lap up entrepreneurs’ hype—and anyone who asks awkward questions risks being cut out of the funding round in favour of someone more trusting.”

“All this helps to explain the inflation of valuations among unlisted technology companies. Today there are 142 **unicorns**, more than three times as many as in 2013. Many of them are growing quickly. But in terms of reaching profitability, they are often far behind the stockmarket-listed competitors they are seeking to displace, and thus are burning through cash. Theranos, for example, is not believed to have any significant revenues or profits, yet it is valued about as highly as Quest Diagnostics, a listed laboratory company, which last year achieved \$7.4 billion in revenues and nearly \$600m in net profits.”

“Many unicorns have been insulated from scrutiny, because they have no obligation to publish figures or provide progress reports on their technology. Not having to worry about a fluctuating share price frees their founders to think long-term, but also makes it easier for them to brush aside searching questions. However, in time Silicon Valley’s growing herd of fabled creatures will have their encounter with reality. If they do not live up to their promise, their valuations will slump, either at their next funding round or when they finally go public. Many vials of blood may spill.”

The Search for the Guilty

- **“Don’t Blame Silicon Valley for Theranos;”** NY Times; Randall Stross; April 27, 2016.
 - http://www.nytimes.com/2016/04/27/opinion/dont-blame-silicon-valley-for-theranos.html?smid=fb-nytimes&smtyp=cur&_r=0
- This article gives insight into the hierarchy of venture capital firms and a kind of Silicon Valley definition of “smart money.”
- It also shows how the myth of the **“college dropout entrepreneur”** definitely does not apply in the life sciences.
- *“Part of the company’s appeal was the familiar origin myth of Theranos’s founder, Elizabeth Holmes, who, like Bill Gates and Mark Zuckerberg before her, dropped out of college in order to found her company.”*
- *“That might impress some social media investors, but in life sciences, everyone puts in years of formal study just to earn a seat at the table. For example, at MPM Capital, a venture firm that invests in life sciences, almost every one of its 20 investing directors and partners has either a Ph.D. or M.D., and one has both. Even the general counsel has a Ph.D. in cell, molecular and developmental biology.”*
- *“GV, formerly Google Ventures, has a five-person investment team for Life Science & Health that includes two members with Ph.D.s in bioengineering; another with both an M.D. and a Ph.D. in biophysics; and a partner who, unlike Ms. Holmes, finished at Stanford, then went on to earn an M.D. and M.B.A. at Harvard.”*

Completely Inadequate Due Diligence

- Craving Growth, Walgreens Dismissed Its Doubts About Theranos; WSJ; May 25, 2016
 - <http://www.wsj.com/articles/craving-growth-walgreens-dismissed-its-doubts-about-theranos-1464207285>
- *“A Hopkins scientist told her that his researchers needed to put the device in their Baltimore laboratory to verify the technology on Walgreens’ behalf, and Ms. Holmes agreed to provide one, say people familiar with the meeting.”*
“It never happened. Walgreens wound up making a deal that included plans to put Theranos blood-testing centers in thousands of its drugstores across the U.S. despite never fully validating the startup’s technology or thoroughly evaluating its capabilities, according to people familiar with the matter.”
- *“Again and again, Walgreens moved forward anyway, partly because executives worried Theranos would choose a different drugstore chain as partner if they pressed Ms. Holmes too hard.”*

The bigger they are the harder they fall.

“From \$4.5 Billion To Nothing: Forbes Revises Estimated Net Worth Of Theranos Founder Elizabeth Holmes”

- Forbes, Matthew Herper , June 21, 2016.

Last year, [Elizabeth Holmes](#) topped the [FORBES list of America's Richest Self-Made Women](#) with a net worth of \$4.5 billion. Today, FORBES is lowering our estimate of her net worth to nothing. Theranos had no comment.

Our estimate of Holmes' wealth is based entirely on her 50% stake in Theranos, the blood-testing company she founded in 2003 with plans of revolutionizing the diagnostic test market. Theranos shares are not traded on any stock market; private investors purchased stakes in 2014 at a price that implied a \$9 billion valuation for the company.

Since then, Theranos has been hit with allegations that its tests are inaccurate and is being investigated by an alphabet soup of federal agencies. That, plus new information indicating Theranos' annual revenues are less than \$100 million, has led FORBES to come up with a new, lower estimate of Theranos' value.

FORBES spoke to a dozen venture capitalists, analysts and industry experts and concluded that a more realistic value for Theranos is \$800 million, rather than \$9 billion. That gives the company credit for its intellectual property and the \$724 million that it has raised, according to VC Experts, a venture capital research firm. It also represents a generous multiple of the company's sales, which FORBES learned about from a person familiar with Theranos' finances.

<http://www.forbes.com/sites/matthewherper/2016/06/01/from-4-5-billion-to-nothing-forbes-revises-estimated-net-worth-of-theranos-founder-elizabeth-holmes/#33079b5b2f29>



Theranos founder's net worth goes from \$4.5 BILLION to nothing

Last year she was on top of the world, but now Elizabeth Holmes has a net worth of zero, according to a new Forbes estimate.

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Banned!

- And now she is banned.
 - “Theranos CEO Elizabeth Holmes banned for two years from industry she aimed to transform;” STAT; Megan Thielking @meggophone; July 8, 2016.
 - <https://www.statnews.com/2016/07/08/theranos-elizabeth-holmes-banned/>
- “Federal regulators have banned Theranos founder Elizabeth Holmes from owning or operating a medical laboratory for at least two years.”
- “Theranos rose to startup stardom after promising accurate blood test results with just a prick of the finger, but a review of the company’s Newark, Calif., lab last year — following a steady drumbeat of investigative stories from the Wall Street Journal — called its technology into question.”
- “The Centers for Medicare and Medicaid Services first threatened sanctions in March, after pointing out deficiencies that regulators said posed “immediate jeopardy to patient health and safety.””

Questions:



- Why do you think that private investors have valued Theranos at \$9 B when both competitors are much larger and only valued at \$10 to \$12 billion?
- What are some of the potential problems with Theranos strategy of offering test directly to consumers?
- Discuss how media hype and silicon valley legend helped create this mess.
- Given the setbacks that they have encountered, are you betting on Theranos' success or failure? Why or why not?