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¶1: Startup Failure Post-Mortems 2015 First Update (8/15/2015)

¶2: Nebula

~~¶3: Title: Nebula Is Shutting Down(NOT WORKED)~~

¶4: *Title: OpenStack start-up Nebula is shutting down
¶5: *Title Link: https://www.datacenterdynamics.com/en/news/openstack-start-up-nebula-is-shutting-down/

¶6: Product: Nebula

¶7: Product Link: https://www.cbinsights.com/company/nebula

¶8: At the same time, we are deeply disappointed that the market will likely take another several years to mature. As a venture backed start up, we did not have the resources to wait.

¶9: Nebula

¶10: COMPUTER HARDWARE & SERVICES | IT Services / Infrastructure & Hosting
¶11: nebula.com

¶12: Founded Year

¶13: 2011

¶14: Stage

¶15: Dead | Dead

¶16: Total Raised

¶17: $28.5M

¶18: About Nebula

¶19: Nebula is dedicated to enabling all businesses to easily, securely, and inexpensively deploy large private cloud computing infrastructures. The company has developed a hardware appliance that allows any business to easily build a massive private computing cloud from hundreds or thousands of inexpensive computers. Nebula's goal is to ignite a new era of global innovation by making big data and large scale computing accessible to every business in the world. We believe that the proliferation of data will fuel an "information revolution" across all industries, and will be enabled by democratizing web-scale cloud technology.

¶20: Nebula Headquarter Location

¶21: 215 Castro Street 3rd Floor
¶22: Mountain View, California, 94041,
¶23: United States
¶24: 650-593-9900
¶25:

¶26:

¶27:

¶28: By Serdar Yegulalp, Senior Writer, InfoWorld | APR 2, 2015 11:08 AM PDT

¶29: https://www.infoworld.com/article/2905296/how-not-to-market-openstack-a-lesson-from-nebulas-

¶30: How not to market OpenStack: A lesson from Nebula's failure

¶31: The demise of Nebula indicates that delivering OpenStack via a hardware appliance was bound to fail in the long run

¶32:

¶33: starwalk nebula

¶34: Nebula, maker of a hardware-based OpenStack turnkey solution, closed its doors on April 1 -- no joke.

¶35:

¶36: The company, which was founded by one of OpenStack's original progenitors, failed in big part because it delivered a product that was less OpenStack than a proprietary solution.

¶37:

¶38: "When we started this journey four years ago," reads a notice on Nebula's home page, "we set out to usher in a new era of cloud computing by curating and productizing OpenStack

for the enterprise. We are incredibly proud of the role we had in establishing Nebula as the leading enterprise cloud computing platform. At the same time, we are deeply disappointed that the market will likely take another several years to mature. As a venture-backed startup, we did not have the resources to wait."

¶39:

¶40: [Also on InfoWorld: The best open source software of 2021]

¶41: The maturity of the OpenStack market wasn't the only problem for Nebula. There was also the nature of its product stemming from expectations for OpenStack.

¶42:

¶43: The OpenStack creators -- and the OpenStack appliance people

¶44: Nebula was co-founded by Chris Kemp -- formerly of NASA's Ames Research Center, where he developed part of OpenStack's core components -- with venture capital from Kleiner Perkins. His company's approach to the OpenStack market wasn't only to sell service or an enterprise distribution as Mirantis or Red Hat do, but to sell a complete turnkey hardware product.

¶45:

¶46: The hardware in question was a controller appliance used to drive a cluster of up to 20 nodes per controller and up to five controllers per cluster. Setup was near-automatic, and upgrades to OpenStack were rolled out to the controller by Nebula.

¶47:

¶48: Nebula believed its solution wasn't only more convenient, but "a true enterprise product with support that provides the enterprise integration capabilities (networking, storage, identity), all preconfigured and hardened," as Nebula CEO Gordon Stitt put it in an email earlier this year.

¶49:

¶50: [FREE report! Learn how leading CIOs are maximizing the utility of data collected through multiple channels. Download now!]

¶51: He believed Nebula's solution was superior to building OpenStack in-house and by hand, or hiring a professional services team: "We provide all of the testing and upgrading on the six-month cycle, and since our OpenStack implementation is a product, all of our implementations are identical so this is a simple, automated upgrade."

¶52:

¶53: Unfortunately, the market didn't favor Nebula's hardware-centric approach.

¶54:

¶55: The crucial mistakes

¶56: What went wrong? Cost of the solution aside, Nebula's product ran contrary to the way OpenStack itself was conceived.

¶57:

¶58: Those who make a deep investment in OpenStack, as Walmart did, learn quickly how tough it is to work with. Standing up a stack and getting it running is only part of the deal; the work also includes upgrading the stack across releases, and -- most important -- building your own enterprise-specific customizations into OpenStack, which is one of the big reasons to invest in an OpenStack setup in the first place.

¶59:

¶60: Once all that's mastered, the payoffs of using OpenStack also become bigger, and the resulting stack can become the enterprise's own creation, rather than the vendor's. With a managed, appliance-based approach, it's harder for a company to reintegrate its own changes.

¶61:

¶62: Another place where Nebula fell down: It aimed for a shrinking market. Stitt saw Nebula serving enterprise that wanted to build "a truly seamless hybrid cloud using the same technology on-premise due to security or regulatory requirements and data residency requirements. The residency requirements -- that data never leaves the enterprise -- may be regulatory or may be due to the cost and/or latency of transferring data in and out of a public cloud."

¶63:

¶64: But costs and requirements have been receding with each passing year, if not month. To that end, Nebula was not the only turnkey OpenStack solution out there, and many options were delivered as managed solutions on cloud-hosted hardware (Ubuntu BootStack, Mirantis OpenStack Express).

¶65:

¶66: Finally, OpenStack's deployment issues seemed best solved within OpenStack itself through software -- which was bound to happen sooner or later -- rather than through what amounted to an ongoing dependency on a vendor's proprietary deployment solution.

¶67:

¶68: What the market didn't bear

¶69: The wording in Nebula's farewell note seems to assign part of the blame on the way OpenStack has taken years to achieve the uptake its proponents envisioned.

¶70:

¶71: This is in part a valid conceit. Only after four years did enterprise interest in the technology seem to turn the corner -- even then, the majority of its enterprise use, as of May last year, was modest compared to the scale and scope of Linux itself. Most of the deployments at scale were confined to verticals like telecom, with enterprise deployments largely modest affairs. (The most recent edition of the survey no longer tracks the size of deployments.) Container technologies also seem more likely to hit the sweet spot of what enterprises actually need, given the way they've enjoyed the kind of rapid and broad uptake that OpenStack hasn't seen.

¶72:

¶73: But none of that has stopped companies like Canonical, Mirantis, or Red Hat from reaping investments made into OpenStack. With Canonical and Red Hat, their OpenStack work has been part of a larger portfolio of enterprise open source technologies, including containers. With Mirantis, it's been about easy deployment and a professed devotion to the openness of the underlying system.

¶74:

¶75: In the end, the failure of Nebula is less about OpenStack's larger issues and more about a company that tried to sell a proprietary hardware solution to deliver and maintain an open source software stack -- in short, a company that provided the wrong solution to the wrong problem.

¶76:

¶77: Related: OpenStack Open Source

¶78: Serdar Yegulalp is a senior writer at InfoWorld, focused on machine learning, containerization, devops, the Python ecosystem, and periodic reviews.

¶79:

¶80: Follow

¶82:

¶83: How to choose a low-code development platform

¶84: InfoWorldFOLLOW US

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¶86: IDG Communications

¶88:

¶89: Explore the IDG Networkdescend

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¶1: Startup Failure Post-Mortems 2014 Second Update (9/24/2014)

¶2: Nirvanix

¶3: Title: A Nirvanix Postmortem – Why There's No Replacement For Due Diligence
¶4: Title Link: https://www.forbes.com/sites/benkepes/2013/09/28/a-nirvanix-post-mortem-why-theres-no-replacement-for-due-diligence/?sh=79d18d612556

¶5: Product: Nirvanix

¶6: Product Link: https://www.cbinsights.com/company/nirvanix

¶7: The cloud is great. Outsourcing is great. Unreliable services aren't. The bottom line is that no one cares about your data more than you do – there is no replacement for a robust due diligence process and robust thought about avoiding reliance on any one vendor.

¶8: Nirvanix

¶9: INTERNET | Internet Software & Services / Data Storage
¶10: nirvanix.com

¶11: Founded Year

¶12: 1998

¶13: Stage

¶14: Dead | Dead

¶15: Total Raised

¶16: $70M

¶17: About Nirvanix

¶18: Nirvanix is a provider of enterprise-class cloud storage services designed specifically for customers with expectations of extreme security, reliability and redundancy. Under its CloudComplete portfolio, Nirvanix offers fully managed public, hybrid and private cloud storage services with usage-based pricing. The company's second generation technology is utilized by IT OEMs and is fully integrated with third-party backup and archiving software products and appliances, enabling One Click to the Cloud.In September 2013, Nirvanix shut down notifiying users they needed to migrate their data

¶19: Nirvanix Headquarter Location

¶20: 9191 Towne Centre Drive Suite 510
¶21: San Diego, California, 92122,
¶22: United States
¶23: 619-764-5650
¶24:
¶25:
¶26:
¶27: AT:
https://www.computerweekly.com/opinion/Nirvanix-failure-a-blow-to-the-cloud-storage-model
¶28:
¶29: As we go to press it looks like Nirvanix – a pioneer of cloud storage – has, according to widespread reports, closed its doors in what is a huge blow for customers and the very idea of cloud storage.
¶30:
¶31: Nirvanix's customers were apparently given two weeks to move all their data out of its facilities. That’s not what you want to hear if you’re a customer. If you used Nirvanix for third or fourth duplicate copies you need assurance that data will be destroyed. If you used it for primary data you need that data back, and that is no trivial task right now.
¶32:
¶33: The whole scenario is clearly also a big blow to the cloud storage model, since it apparently validates fears over the risks of handing your data over to a third party.
¶34:
¶35: But taking a step back, the question is begged; why did Nirvanix fail, and what are the implications of this for other cloud storage specialists? After all, the company seemed to have a lot going for it. It had first mover advantage, and this brought it plenty of funding; around $70m in total.
¶36:
¶37: It also brought in an extremely experienced management team and established a good-sized customer base including some large organisations in the media, financial, healthcare and education verticals, not to mention plenty of service providers.
¶38:

¶39: Finally – and crucially for any startup in terms of third part validation– it won the support of some of the industry's heavyweights including a strategic partnership with IBM Global Services in October 2011.
¶40:
¶41: It seems these apparent tailwinds ultimately failed to count. We believe the seeds of Nirvanix's failure were sown much earlier. Indeed, the company may have been doomed from the start. Why is this? We think there are three primary reasons.
¶42:
¶43: A capex-centric model drained the coffers
¶44: One aspect of Nirvanix's approach that made it stand out from the crowd is that it was, in effect, a service provider, offering storage-as-a-service billed on a $/GB basis at a competitive price point. The idea was that this would appeal to customers because it simplified things – one bill, only one throat to choke if things go wrong etc.
¶45:
¶46: But in reality this became the albatross around Nirvanix's neck because it had to construct its own physical infrastructure at no little expense; the company built out several storage nodes worldwide for storing customer data, and also offered the option for customers to deploy one of its nodes on-site – though still managed by Nirvanix – as a private cloud.
¶47:
¶48: This model, we believe, was its undoing. It raised a good amount of funding, using this cash to rent floorspace in datacentre facilities and buy hard drives, enclosures, racks and other components to assemble multiple very large storage systems. But, this is not the way to offer differentiated value; it's table stakes stuff. And in a market where prices are being continually squeezed by much larger rivals – giants such as Amazon and Microsoft – Nirvanix was always going to be at a disadvantage to these rivals' enormous economies of scale.
¶49:
¶50: This perhaps wouldn't be so bad were Nirvanix operating on a relatively small scale, but Nirvanix was a big-game hunter; as far as it was concerned, the more data the better. It cited several multi-petabyte deals, including an 8.5PB digital archive with the University of Southern California, though it said other deals were substantially larger.
¶51:
¶52: Storing such data volumes requires substantial capital investments, and though the inner workings of Nirvanix's technology were never fully discussed (see point 2, below), Nirvanix's pay-per-month business model meant it had to bear much of the up-front cost itself. This is a very difficult model to sustain at significant scale, especially for a startup.
¶53:
¶54: Where was the real IP?
¶55: Allied to this was a nagging suspicion that Nirvanix had a relatively small base of software Intellectual property. Though it waxed lyrical about its Cloud File System the company was reluctant to share details of its underlying storage architecture, and whether there was any significant IP here.
¶56:
¶57: The success of the business would have depended in large part on its ability to scale effectively and efficiently; if it didn't have much in the way of real smarts here then this would hamstring its efforts to remain cost competitive. It also relied fairly heavily on partners for crucial aspects of its service; for example, it partnered frequently with cloud storage gateway vendors

such as Panzura to on-ramp data onto its cloud. Though it had some of its own capabilities here (ie, CloudNAS) these didn't scale to meet the requirements of many customers.

¶58:

¶59: This is not to say that Nirvanix wasn't innovative. It pioneered the notion of storage capacity as a service, but without serious software smarts to optimise the infrastructure this was never going to be enough.

¶60:

¶61: Limited appeal of storage-only services

¶62: Storage doesn't exist in a vacuum, and while there are undoubtedly plenty of storage-specific services, such as those mentioned above, in reality this is still a small market overall. Moreover, while storage-as-a-service for things like backup and disaster recovery is indeed booming, adoption is overwhelmingly among small and mid-sized businesses; Nirvanix, on the other hand, was primarily targeting large enterprises, because of the much larger deal sizes on offer.

¶63:

¶64: Nirvanix never really succeeded in evolving beyond offering storage-as-a-service. Amazon sells bucket-loads of storage, but in large part this is because the storage is attached to some other application or service also running on AWS. Because Nirvanix could not effectively compete as a broad-based IaaS provider (see point 1), this ultimately limited the extent to which customers regarded it as a strategic cloud partner; if the customer wanted anything other than storage in the cloud, they had to look elsewhere.

¶65:

¶66: Lessons to learn?

¶67: While its always tempting to view one failure as symptomatic of a wider issue, it's important to view it as just that; the failure of one relatively small operation. Nirvanix is not the first – recall Iron Mountain's decision to pull its cloud storage service a couple of years ago, and even the failure of storage service providers such as StorageNetworksInc over a decade ago? – and it probably won't be the last, though it is one of the most high-profile businesses of the cloud-era to actually fail.

¶68:

¶69: Ultimately though, we think Nirvanix's problems were self-inflicted. The market for cloud storage undeniably exists, but as a small startup Nirvanix's focus was on the wrong part of the solution. Nirvanix will go down as a cautionary tale and a brutal example of that old technology maxim; innovate, or die.

¶70:

Why Do Startups Fail? Because Hardware is Hard

wired.com/story/why-do-startups-fail-because-hardware-is-hard

Erin Griffith September 28, 2017

Few venture-capital investors have forgotten the story of Pebble: In 2012, after every VC firm on Sand Hill Road had passed on investing, the smartwatch startup raised more than $10 million on crowdfunding site Kickstarter. It was an unheard-of amount for a crowdfunding campaign, and the resulting hype made Pebble an internet sensation. Then the VCs, suffering from FOMO, begged Pebble to let them invest. The startup eventually raised a total of $59 million.

Investors have been loath to repeat the mistake ever since. Venture funding for hardware startups hit an eight-year high in 2016, with investors pouring $4.4 billion into 624 startups, according to data provider CB Insights.

Likewise, hardware entrepreneurs are eager to use a successful crowdfunding campaign as evidence of customer demand for their product. If tens of thousands of people are willing to donate money or pre-order a product that doesn't yet exist, surely millions will want to buy it in a store, the thinking goes. More than half of gadget startups raised their first funding on a crowdfunding website, according to CB Insights.

But it takes time and a lot of money to bring hardware to market, and in the last year a number of well-funded hardware startups have flamed out spectacularly. Wearable startup Jawbone, backed by $930 million, sold its assets earlier this year. E-cigarette company Njoy, backed by $181 million, went bankrupt last year and liquidated its assets. Kitchen appliance maker Juicero, backed by $100 million, shut down over the summer. And Fuhu, a tablet startup; Zeebo, a gaming console; and Hello, a sleep tracker; which each raised more than $50 million, have ceased operations.

Amid the failures, it's increasingly clear that crowdfunding success does not automatically equate to widespread consumer demand. A new study from CB Insights analyzes the failures of 382 hardware startups, finding that the biggest reason they fail is a lack of demand for their products. In other words, a popular crowdfunding project can be deceptive. According to the report:

> Startups are likely raising money to get to a limited release stage, and then finding that there is not a large enough market for their product to justify a larger raise and production at scale.

The study cites overspending as the second reason for failure and waning interest after an initial crowdfunding campaign as the third. On the surface, the reasons aren't too different from the reasons all startups fail. A prior report from CB Insights found that the top reason unsuccessful startup founders believe their companies failed is the lack of a market need for their product.

That may seem obvious, but the cult of entrepreneurship encourages startup founders to ignore signs that their idea won't work. Building the future around one's own vision requires a bit of irrationality. Startup mythology largely ignores failures, in favor of the rarer successes. As Steve Jobs famously said, "A lot of times, people don't know what they want until you show it to them."

It's an inspirational idea, but most startups fail to live up to it. Crowdfunding exacerbates this problem of false hope, making customer demand appear stronger than it actually is. Investors wowed by buzzy crowdfunding campaigns would do well to remember how the Pebble story ended: In December 2016, the startup shut down, selling its assets to competitor Fitbit.

The 5 reasons why hardware startups fail

techinasia.com/talk/5-reasons-hardware-startups-fail

July 18, 2016

 Daniel Ellis · 18 Jul 2016

On July 7, 2016, Theranos CEO Elizabeth Holmes was barred from owning or running a laboratory for two years. Theranos also had its licence to operate its laboratory in California revoked.

This highly consequential decision by the US government regulator, hot on the heels of Forbes' downgrade of Theranos' valuation from $9 billion to $800 million and Ms Holmes' own net worth to zero, should come as no surprise. The company has been struggling to maintain its credibility since October 2015, when its practices and technology was first brought into question by the WSJ.

As Ms Holmes' problems mounted, she famously paraphrased Gandhi by saying, "First they think you're crazy, then they fight you, and then all of the sudden you change the world."

It seems not that long ago that Theranos was held up as the shining example of a hardware startup taking on a big, established industry. It's the latest in a series of high profile hardware startup failures that includes Coolest Cooler, Zano, Makerbot, Pirate 3D, Novelsys and Better Place. There are many others. Too many to mention in one article.

But why look into failures?

Surely there are many more success stories like Tesla, Xiaomi, and Raspberry Pi that one can rather strive to emulate?

Not so simple!

Reason being that when it comes to hardware startups, the challenges seems to be remarkably similar; for failed companies and successful ones alike. Not just that, it transcends geography and industries.

Unfortunately, mistakes tend to only reveal themselves after a startup fails, so those are the best places to look in order dissect, learn from them, and create future success.

> "At some point, everything's gonna go South on you. You're going to say 'This is it… this is how I end.' Now, you can either accept that, or you can get to work. You solve one problem, and then you solve the next problem, and the next, and if you solve enough problems, you get to go home." – Mark Watney (as played by Matt Damon in the movie The Martian)

Not all failures are created equal

Prof. Amy C. Edmondson from Harvard Business School wrote an article in 2011 that asserts not all failures are equal. She splits them up into three categories:

- Preventable failures in predictable operations
- Unavoidable failures in complex systems
- Intelligent failures at the frontier (or rather… happy accidents)

In this series, I'll be looking more deeply at five overarching, preventable failures, the lessons to learn from them and the skills needed to either avoid or recover from them.

Over the next few weeks I'll be working through detailed case studies and conduct interviews to help break down and analyse the biggest challenges hardware startups face and if circumstances makes them unavoidable, look at options how to overcome them.

Unlike most similar type articles, I'll delve deep into each topic to be as comprehensive and thorough as possible. Keep in mind that although this series focus on hardware startups, the business lessons to be learned is helpful for all founders.

Without further delay, here are the 5 reasons hardware startups fail, in no particular order.

1. Engineering/technical design issues

Here I'll show how technical issues, bad product decisions, over-promising and too many changes can delay or derail a project completely.

I'll also look at the type of testing you should be doing at each project phase.

2. Superiority bias

The traits of the typical entrepreneur can, in many cases, be seen as overconfidence, arrogance, naivety or unemployability. These traits can be either a boon or a bane for the project and the company as a whole.

We'll show how to recognize and manage said traits to further increase chances of success.

3. Timing problems

Not the dark magic many people think it is. I'll provide you with the checklist to be more sure whether the timing for your concept is right or not.

I'll also use case studies to illustrate where timing has made a deciding difference in the success of a product.

4. Poor execution

Execution can refer to Operations and Decision making or Internal Admin and Regulation. I'll discuss both separately.

I'll discuss the commercialization process in detail and point out the various pitfalls along the way. The administrative process, often seen like a necessary evil when it fact, it being a structure that supports your project and company, is a strong indicator of future business success.

5. Insufficient funding

The one we obsess most about and so very often get horribly wrong.

I'll discuss the various options of funding available to hardware startups and elaborate on ones that spare you from giving away too much equity to make your dreams come true. I'll also show you how to prepare a budget for a hardware project and work through a sample product.

There are many other reasons startups fail, but speaking from my own experience and research, these are the ones that present the highest risk that are at the same time, manageable. While I do not claim to be an expert in each of these issues, I will take the necessary effort to include data, case studies and expert opinions.

Please join in the discussion and share your own experiences. Let us all learn from each other.

This article is the first of 'The Hardware Series', where the author covers in detail why hardware startups fail.

Editing by Sim Yanting

Community Writer

Daniel Ellis

Daniel J Ellis is firstly, trained in financial management and accounting, and secondly, a tech geek who loves playing with the latest technologies and electronics boards.

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¶1: Startup Failure Post-Mortems 2017 Third Update (10/31/17)

¶2: Pearl Automation

¶3: Title: Auto startup Pearl shuts down

¶4: Title Link: https://www.axios.com/automotive-startup-pearl-is-shutting-down-2448087174.html

¶5: Product: Pearl Automation's wireless rear-view camera

¶6: Product Link: https://www.cbinsights.com/company/pearl-automation

¶7: Pearl's demise was first reported by Axios.

- ¶8: What happened: Early product sales disappointed, which was exacerbated by a high burn rate.
- ¶9: What next? The Pearl Automation team received several "acqui-hire" offers, but opted instead to shut down and part ways, according to a source close to the situation.
- ¶10: Background: Pearl was founded in 2014 by three ex-Apple iPod engineers, and hired dozens of other ex-Apple employees. It eventually settled on the wireless rear-view camera as a first step in developing autonomous driving technology — and

raised $50 million in VC funding from Accel, Shasta Ventures, Venrock, and Wellcome Trust.

¶11: Pearl Automation

¶12: AUTOMOTIVE & TRANSPORTATION | Automobile Parts

¶13: pearlauto.com

¶14: Founded Year

¶15: 2014

¶16: Stage

¶17: Dead | Dead

¶18: Total Raised

¶19: $50M

¶20: About Pearl Automation

¶21: Pearl Automation is focused on advancing the underlying technologies in the autonomous vehicle to improve the experience for every driver on the road today. The Company's first product, RearVision, is an advanced automotive backup camera that connects to a driver's smartphone via wi-fi. RearVision installs in minutes, provides obstacle alerts and updates automatically to deliver ongoing feature enhancements.

¶22: Pearl Automation Headquarter Location

¶23: 100 Enterprise Way Suite A101

¶24: Scotts Valley, California, 95066,

¶25: United States

¶26: 844-877-3275

¶27:

¶28: Exclusive: Auto startup Pearl shuts down

¶29: Dan Primack, Kia Kokalitcheva Jun 26, 2017 – Technology

¶30: Title Link: https://www.axios.com/automotive-startup-pearl-is-shutting-down-2448087174.html

¶31:

¶32:

¶33: Courtesy of Pearl Automation

¶34: Pearl Automation, an automotive startup founded by former Apple engineers, has decided to shut down, Axios has learned from multiple sources. The move comes just a year after the company unveiled its first product, a wireless rear-view camera, which began to ship last September.

- ¶35: **What happened:** Early product sales disappointed, which was exacerbated by a high burn rate.
- ¶36: **What next?** The Pearl Automation team received several "acqui-hire" offers, but opted instead to shut down and part ways, according to a source close to the situation.
- ¶37: **Background:** Pearl was founded in 2014 by three ex-Apple iPod engineers, and hired dozens of other ex-Apple employees. It eventually settled on the wireless rear-view camera as a first step in developing autonomous driving technology – and raised $50 million in VC funding from Accel, Shasta Ventures, Venrock, and Wellcome Trust.

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I'll also look at the type of testing you should be doing at each project phase.

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The traits of the typical entrepreneur can, in many cases, be seen as overconfidence, arrogance, naivety or unemployability. These traits can be either a boon or a bane for the project and the company as a whole.

We'll show how to recognize and manage said traits to further increase chances of success.

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Not the dark magic many people think it is. I'll provide you with the checklist to be more sure whether the timing for your concept is right or not.

I'll also use case studies to illustrate where timing has made a deciding difference in the success of a product.

4. Poor execution

Execution can refer to Operations and Decision making or Internal Admin and Regulation. I'll discuss both separately.

I'll discuss the commercialization process in detail and point out the various pitfalls along the way. The administrative process, often seen like a necessary evil when it fact, it being a structure that supports your project and company, is a strong indicator of future business success.

5. Insufficient funding

The one we obsess most about and so very often get horribly wrong.

I'll discuss the various options of funding available to hardware startups and elaborate on ones that spare you from giving away too much equity to make your dreams come true. I'll also show you how to prepare a budget for a hardware project and work through a sample product.

There are many other reasons startups fail, but speaking from my own experience and research, these are the ones that present the highest risk that are at the same time, manageable. While I do not claim to be an expert in each of these issues, I will take the necessary effort to include data, case studies and expert opinions.

Please join in the discussion and share your own experiences. Let us all learn from each other.

This article is the first of 'The Hardware Series', where the author covers in detail why hardware startups fail.

Editing by Sim Yanting

Community Writer

Daniel Ellis

Daniel J Ellis is firstly, trained in financial management and accounting, and secondly, a tech geek who loves playing with the latest technologies and electronics boards.

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 8:14:20 PM

Modified By: HEIDER

Size: 61 KB

¶1: Startup Failure Post-Mortems 2015 Second Update (12/3/2015)

¶2: QBotix

¶3: Title: RIP QBotix: Robotic Solar Tracking Fails to Reach the Market

¶4: Product: QBotix

¶5: Each member of our now pared-down team knew exactly how much runway the company had remaining, the status of our strategic talks, and the acknowledged long odds we faced as a going concern. To their credit, they remained focused, productive and on-task until our final day — a remarkable expression of dedication to the mission and to each other. Sadly, and in spite of the achievements, we simply ran out of time and cash to finish the job.

¶6: QBotix

¶7: ENERGY & UTILITIES | Renewables / Solar

¶8: qbotix.com

¶9: Stage

¶10: Dead | Dead

¶11: Total Raised

¶12: $24.47M

¶13: About QBotix

¶14: QBotix employs distributed robotics to significantly increase the economics and improve the capabilities of the solar industry. The SolBot R-225, a mobile robot for positioning solar panels and collecting data that is at the heart of RTS, builds upon the technical innovations of the SolBot R-200. The SolBot R-225 can manage 340 kilowatts of solar panels, a 13 percent improvement over the SolBot R-200. The SolBot R-225 is also smaller, lighter and requires fewer components than its predecessor, which increases reliability and allows the SolBot to operate in a wider variety of extreme environmental conditions. Additionally, the tracking rail for the SolBot R-225 consists of two preassembled pieces rather than multiple parts so it can be quickly snapped together on site.

¶15: QBotix Headquarter Location

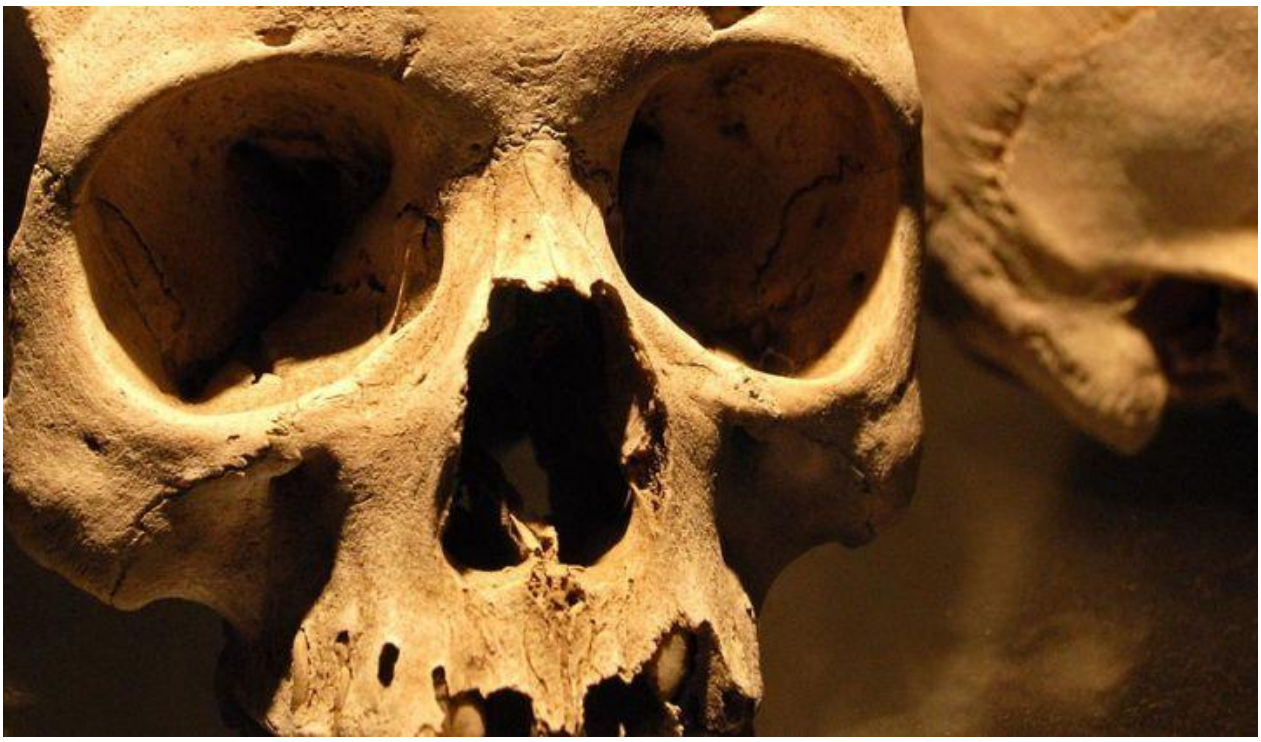
¶16: 1080 O'Brien Drive
¶17: Menlo Park, California, 94025,
¶18: United States
¶19:

¶20:

¶21: RIP QBotix: Robotic Solar Tracking Fails to Reach the Market

¶22: These aren't the droids you're looking for.
¶23: **ERIC WESOFF SEPTEMBER 21, 2015**
¶24: **LINK:**
HTTPS://WWW.GREENTECHMEDIA.COM/ARTICLES/READ/QBOTIX-ROBOTIC-SOLAR-TRACKING-FAILS-TO-REACH-THE-MARKET

¶25:



¶26: *RIP QBotix: Robotic Solar Tracking Fails to Reach the Market*
¶27: *Photo Credit: Gonzo Carles Creative Commons*
¶28: According to several sources close to the company, solar tracker startup QBotix dismissed most of its staff and shuttered its operations last month. The company's website is offline, as is its phone service. CEO Mike Miskovsky confirmed that QBotix ceased operations as of August 2015.

¶29: QBotix had a novel solar-tracking solution that maximized output and could lower balance-of-system costs in ground-mounted PV installations. The startup invented a two-axis tracker system where the motors, instead of being installed two per tracker, were moved around by a rail-mounted robot that adjusted each tracker every 40 minutes, resulting in a reduction in the number of (failure-prone) motors.

¶30: But while QBotix was trying to gain traction, single-axis solar trackers were also evolving and driving down cost by reducing motors and lowering the labor requirements and costs of foundations. Earlier this month, Flextronics acquired tracker startup NEXTracker for up to $330 million.
¶31:
¶32: QBotix's engineering issues might be confronted and costs could be driven down, but new, risky technologies just don't get used by solar project developers

-- the most conservative players in a conservative utility power market. Market acceptance and adoption did not happen anywhere fast enough to allow this startup to scale.

¶33: In order to get to market, QBotix recently attempted to pivot to a licensing and software sales model "and away from low-margin tracker structure design/manufacture."

¶34:

¶35: Miskovsky notes, "Throughout this strategic 'pivot' process -- which included layoffs, several months of negotiations with potential licensees and/or acquirers of the company, and a continuously diminishing cash balance -- management maintained an open dialogue with the QBotix staff. Each member of our now pared-down team knew exactly how much runway the company had remaining, the status of our strategic talks, and the acknowledged long odds we faced as a going concern. To their credit, they remained focused, productive and on-task until our final day -- a remarkable expression of dedication to the mission and to each other. Sadly, and in spite of the achievements, we simply ran out of time and cash to finish the job."

¶36: In 2012, QBotix raised $7.5 million from Firelake, NEA, DFJ JAIC, Siemens Ventures, and angel investors. In 2014, the company raised $12 million led by E.ON and Iberdrola.

¶37: When the company was unveiled in 2012, we asked:

- ¶38: How does QBotix get this new product deployed in commercial solar fields at scale with conservative engineering, procurement and construction firms as customers -- and even more conservative banks backing the solar projects?
- ¶39: How does a tiny VC-funded firm back up its product in a fashion that quells the doubts of its staid channel partners?

¶40: QBotix never answered those questions.

¶41:

¶42:

¶43:

¶44:

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 03-Jul-21 9:58:16 AM

Modified By: HEIDER

Size: 573 KB

¶1: Startup Failure Post-Mortems 2019 Second Update (6/19/2019)

¶2: SCHAFT

¶3: Title: Google parent to pull plug on bipedal robot development

¶4: Title Link: https://asia.nikkei.com/Business/Companies/Google-parent-to-pull-plug-on-bipedal-robot-development

¶5: Product: SCHAFT

¶6: Produc Link: https://www.cbinsights.com/company/schaft

¶7: The Google-owned robotics unit has been shut down:

¶8: Following Softbank's decision not to move forward with the Schaft acquisition," an Alphabet spokesperson told Nikkei, "we explored many options but ultimately decided to wind down Schaft. We're working with employees to help them find jobs elsewhere within or outside of Alphabet.

¶9: SCHAFT

¶10: INDUSTRIAL | Machinery & Equipment / Robotics

¶11: schaft-inc.jp

¶12: Founded Year

¶13: 2012

¶14: Stage

¶15: Dead | Dead

¶16: About SCHAFT

¶17: SCHAFT was born in 2012 as a spin-out company from the JSK Laboratory of the University of Tokyo, Graduate School of Information Science and Technology, providing high-power humanoid robots for dirty dangerous and difficult work, and for research purpose.

¶18: SCHAFT Headquarter Location

¶19: Tokyo, Japan

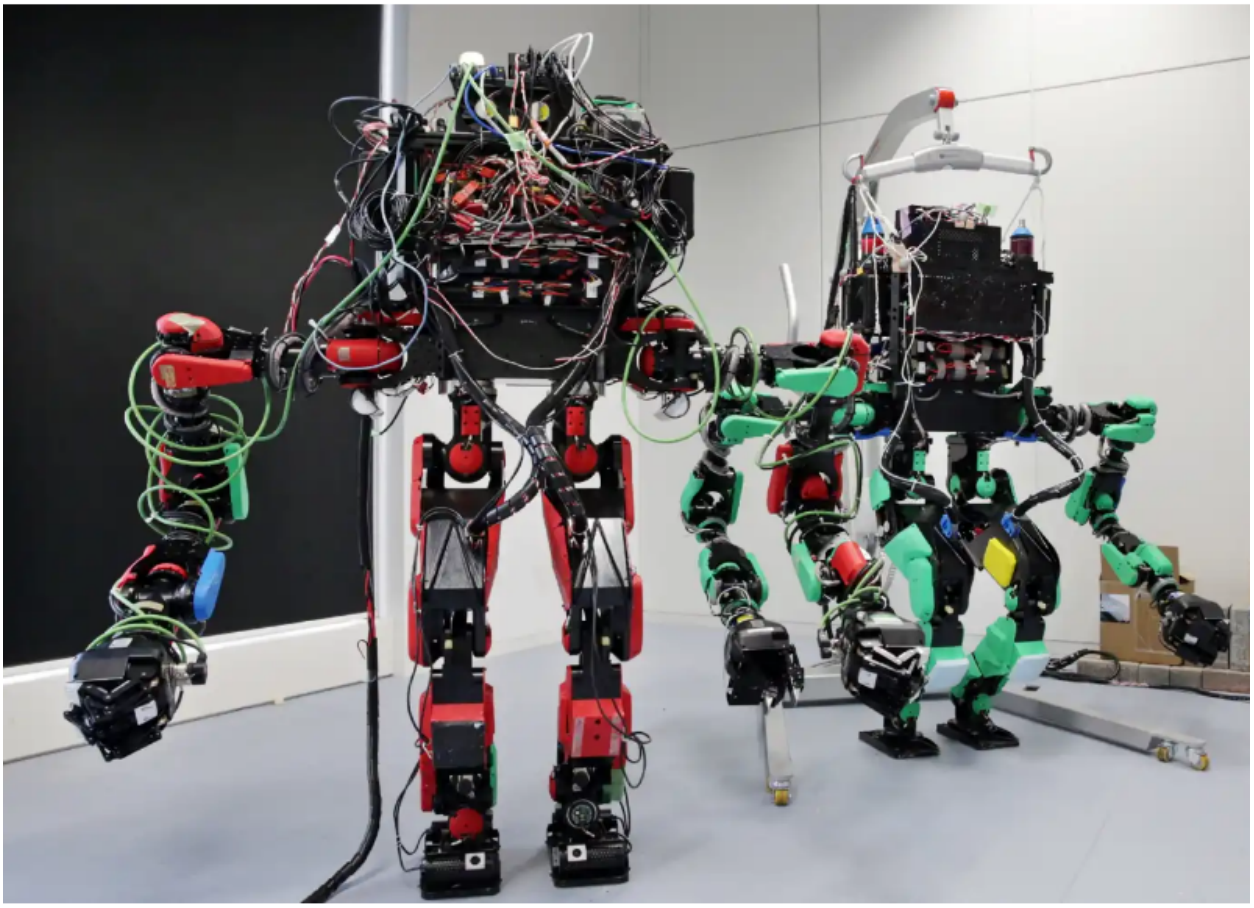
¶20: Google parent to pull plug on bipedal robot development

¶21: **KAZUYUKI OKUDAIRA, Nikkei senior staff writer**November 14, 2018 14:21 JST

¶22: Link: https://asia.nikkei.com/Business/Companies/Google-parent-to-pull-plug-on-bipedal-robot-development

¶23: Tokyo-born unit Schaft lost its way after departure of robot chief Andy Rubin

¶24:



¶25: Bipedal robots developed by Schaft are designed to save human lives at disaster sites.

¶26: TOKYO -- Alphabet, the holding company behind Google, will cease development of bipedal robots, giving up on the prospect of early commercialization. The company is expected to dissolve the project later this year and relocate employees involved in development to other departments within Alphabet or help them find jobs elsewhere.

¶27: Google entered the robotics business in 2013 by buying Schaft, a tech startup founded by University of Tokyo researchers, and other companies. But the company scaled back the business, due in part to the departure of Andy Rubin in 2014, who has led the robotics business.

¶28: SoftBank Group in June 2017 announced that it had agreed with Alphabet to purchase Schaft, but one or more Schaft employees refused to be part of SoftBank, according to people familiar with the matter. SoftBank's attempt to buy Schaft apparently broke down.

¶29: "Following Softbank's decision not to move forward with the Schaft acquisition," an Alphabet spokesperson told Nikkei, "we explored many options but ultimately decided to wind down Schaft. We're working with employees to help them find jobs elsewhere within or outside of Alphabet."

¶30: Yuto Nakanishi, assistant professor of the University of Tokyo, and others established Schaft in 2012. The startup has developed bipedal robots, which can be used to save human lives at disaster sites.

¶31: Schaft couldn't find investors to provide growth capital in Japan and asked Google for help. The company won first place in a robot technology contest hosted by the U.S. Department of Defense immediately after it became part of Google.

¶32: It also has drawn attention as an example that Japanese investors could not spot the potential of promising technology and let it flow overseas.

¶33: Google established holding company Alphabet in 2015 and began managing separately the main business centered on online ads and investment in new ventures.

¶34: At the same time, it separated businesses like Schaft from Google and shifted to a system whereby Alphabet directly manages them.

¶35: Rubin, who led the robotics business, is also known as the creator of the Android operating system. Some media reports claimed that his departure from Google was sparked by his sexual misconduct at the company. Earlier this month, Google employees were angry that the company had paid him a handsome retirement allowance, leading them to organize a massive strike.

¶36: According to the company’s financial results for the July-September quarter, released on Oct. 25, sales at 'Other Bets' including Schaft, in Alphabet parlance, jumped 25% on the year to $146 million. It also posted an operating loss of $727 million, compared with an operating loss of $650 million for the same period last year.

¶37:

¶38:

¶39:

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 08-Dec-21 8:00:31 PM

Modified By: HEIDER

Size: 4 KB

¶1: Startup Failure Post-Mortems 2019 Second Update (6/19/2019)

¶2:

¶3: Seven Dreamers Laboratories

¶4: Title: Laundroid company folds before its giant robot does

¶5: Title Link: https://www.engadget.com/2019-04-23-laundroid-robot-seven-dreamers-bankruptcy.html

¶6: Product: Seven Dreamers Laboratories

¶7: Product Link: https://www.cbinsights.com/company/seven-dreamers-laboratories

¶8: Panasonic-backed Seven Dreamers Laboratories offered a laundry machine which aimed to act as a combined washer, dryer, and clothes folder. Engadget thought that the machine was trying to do too much:

¶9: Clearly, the product was too ambitious. Seven Dreamers had planned a simpler, but still potentially-impressive version that merely folded and sorted clothes. The first-gen model still required a complex combination of robotics, image analysis and artificial intelligence to achieve its goals, however.

¶10: seven dreamers laboratories

¶11: CONSUMER PRODUCTS & SERVICES | Consumer Electronics

¶12: sevendreamers.com

¶13: Founded Year

¶14: 2011

¶15: Stage

¶16: Dead | Dead

¶17: Total Raised

¶18: $104.02M

¶19: About seven dreamers laboratories

¶20: seven dreamers laboratories specializes in the development of AI, robotics, and healthcare devices. The company's products include Laundroid, a fully automatic laundry-folding robot, and Shaft, an original 3D measurement system to manufacture totally order-made carbon golf shafts.

¶21: seven dreamers laboratories Headquarter Location

¶22: Mita Kokusai Building 17F 1-4-28, Mita, Minato-ku
¶23: Tokyo, Japan
¶24: +81-3-6453-7018
¶25:

¶26:

¶27: AT: https://www.failory.com/cemetery/seven-dreamers-laboratories

¶28: The cause of failure can be simply stated as a failure of product strategy. The product that was launched was extremely expensive for the service that it provided and it simply could not match the human dexterity that a simple task like folding laundry required. I guess we all have to be doing our own laundry for the next foreseeable future after all.

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 08-Dec-21 8:05:03 PM

Modified By: HEIDER

Size: 6 KB

¶1: Startup Failure Post-Mortems 2019 Second Update (6/19/2019)

¶2: Stratolaunch

¶3: Title: Space firm founded by billionaire Paul Allen closing operations

¶4: Title Link: https://www.reuters.com/article/us-space-exploration-stratolaunch-exclus/exclusive-space-firm-founded-by-billionaire-paul-allen-closing-operations-sources-idUSKCN1T12FD

¶5: Product: Stratolaunch

¶6: Product Link: https://www.cbinsights.com/company/stratolaunch

¶7: Stratolaunch was founded by late Microsoft co-founder Paul Allen and aimed to launch satellites from planes. The Reuters report of its shuttering came just weeks after it had completed its first test flight:

¶8: The decision to set an exit strategy was made late last year by Allen's sister, Jody Allen, chair of Vulcan Inc and trustee of the Paul G. Allen Trust, one of the four people and the fifth industry source said.

¶9: Jody Allen decided to let the carrier aircraft fly to honor her brother's wishes and also to prove the vehicle and concept worked, one of the four people said.

¶10: Stratolaunch

¶11: INDUSTRIAL | Aerospace & Defense

¶12: stratolaunch.com

¶13: Founded Year

¶14: 2011

¶15: Stage

¶16: Dead | Dead

¶17: About Stratolaunch

¶18: Stratolaunch is developing an air-launch platform to make access to space more convenient, reliable, and routine. The company uses an air-launch approach to deliver payloads to multiple orbits and inclinations in a single flight, which means better access to space.

¶19: Stratolaunch Headquarter Location

¶20: 505 Fifth Avenue South Suite 550
¶21: Seattle, Washington, 98104, United States

¶22:

¶23:

¶24: Why did Stratolaunch fail and shut down?

¶25: At: https://www.failory.com/cemetery/stratolaunch

¶26: Despite everything looking great on paper and the best of minds working together on this project, nothing could have predicted Paul Allen's passing away in October of 2018, which would soon spell out the same fate for Stratolaunch. It became clear that Stratolaunch had been powered only by the vision of its founder, which wasn't necessarily shared by those left in power after him.

¶27:

¶28: In January 2019, rather than scaling back their proposed set of booster-rockets, Stratolaunch scrapped them all. There was to be no space plane, no boosters and no PGA booster (which were proposals of Paul Allen). Instead, the company declared that the giant plane (the Stratolaunch) would be used to launch the much smaller Pegasus XL rocket, a bizarre proposal for a rocket that could already be launched from a much more conventional aircraft. I guess they just wanted to put up a final spectacular show for the viewers by sending the plane with the longest wingspan (the

117m Stratolaunch) towards its successful maiden (and last) flight before completely shutting down.

¶29:

¶30: With a lack of vision and no clear direction, the company became a profligate project that soon burnt the billions that it had received from Vulcan Inc, which was Paul Allen's investment arm. What can ultimately be said about Stratolaunch is that the company was never the same without its key founder, Paul Allen. Think of Apple if Steve Jobs never returned after being fired.

¶31:

¶32: The lack of enthusiasm for Stratolaunch from the rest of the company's employees killed the project before it could even really take off seriously and the Pegasus XL flight test for their carrier was all that the company could do in tribute of its late founder. The proverbial "Tim Cook" of Stratolaunch (Vulcan Inc. CEO Bill Hilf) did not prove to be much of a success either. It was one thing to manage investments of the likes that Vulcan Inc. dealt with, but an entirely different story when you do not have the same passion for tech as the person that mentored you. In June 2019 the Stratolaunch Systems company and assets were put up for sale by Vulcan Inc. for $400 million, (the hefty price tag includes the plane as well as the intellectual property and other facilities). The company successfully transitioned ownership in October of 2019 but hasn't named the owner so far.

The 5 reasons why hardware startups fail

techinasia.com/talk/5-reasons-hardware-startups-fail

July 18, 2016

 Daniel Ellis · 18 Jul 2016

On July 7, 2016, Theranos CEO Elizabeth Holmes was barred from owning or running a laboratory for two years. Theranos also had its licence to operate its laboratory in California revoked.

This highly consequential decision by the US government regulator, hot on the heels of Forbes' downgrade of Theranos' valuation from $9 billion to $800 million and Ms Holmes' own net worth to zero, should come as no surprise. The company has been struggling to maintain its credibility since October 2015, when its practices and technology was first brought into question by the WSJ.

As Ms Holmes' problems mounted, she famously paraphrased Gandhi by saying, "First they think you're crazy, then they fight you, and then all of the sudden you change the world."

It seems not that long ago that Theranos was held up as the shining example of a hardware startup taking on a big, established industry. It's the latest in a series of high profile hardware startup failures that includes Coolest Cooler, Zano, Makerbot, Pirate 3D, Novelsys and Better Place. There are many others. Too many to mention in one article.

But why look into failures?

Surely there are many more success stories like Tesla, Xiaomi, and Raspberry Pi that one can rather strive to emulate?

Not so simple!

Reason being that when it comes to hardware startups, the challenges seems to be remarkably similar; for failed companies and successful ones alike. Not just that, it transcends geography and industries.

Unfortunately, mistakes tend to only reveal themselves after a startup fails, so those are the best places to look in order dissect, learn from them, and create future success.

> "At some point, everything's gonna go South on you. You're going to say 'This is it… this is how I end.' Now, you can either accept that, or you can get to work. You solve one problem, and then you solve the next problem, and the next, and if you solve enough problems, you get to go home." – Mark Watney (as played by Matt Damon in the movie The Martian)

Not all failures are created equal

Prof. Amy C. Edmondson from Harvard Business School wrote an article in 2011 that asserts not all failures are equal. She splits them up into three categories:

- Preventable failures in predictable operations
- Unavoidable failures in complex systems
- Intelligent failures at the frontier (or rather… happy accidents)

In this series, I'll be looking more deeply at five overarching, preventable failures, the lessons to learn from them and the skills needed to either avoid or recover from them.

Over the next few weeks I'll be working through detailed case studies and conduct interviews to help break down and analyse the biggest challenges hardware startups face and if circumstances makes them unavoidable, look at options how to overcome them.

Unlike most similar type articles, I'll delve deep into each topic to be as comprehensive and thorough as possible. Keep in mind that although this series focus on hardware startups, the business lessons to be learned is helpful for all founders.

Without further delay, here are the 5 reasons hardware startups fail, in no particular order.

1. Engineering/technical design issues

Here I'll show how technical issues, bad product decisions, over-promising and too many changes can delay or derail a project completely.

I'll also look at the type of testing you should be doing at each project phase.

2. Superiority bias

The traits of the typical entrepreneur can, in many cases, be seen as overconfidence, arrogance, naivety or unemployability. These traits can be either a boon or a bane for the project and the company as a whole.

We'll show how to recognize and manage said traits to further increase chances of success.

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Not the dark magic many people think it is. I'll provide you with the checklist to be more sure whether the timing for your concept is right or not.

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The one we obsess most about and so very often get horribly wrong.

I'll discuss the various options of funding available to hardware startups and elaborate on ones that spare you from giving away too much equity to make your dreams come true. I'll also show you how to prepare a budget for a hardware project and work through a sample product.

There are many other reasons startups fail, but speaking from my own experience and research, these are the ones that present the highest risk that are at the same time, manageable. While I do not claim to be an expert in each of these issues, I will take the necessary effort to include data, case studies and expert opinions.

Please join in the discussion and share your own experiences. Let us all learn from each other.

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Editing by Sim Yanting

Community Writer

Daniel Ellis

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Modified On: 03-Jul-21 12:36:39 PM

Modified By: HEIDER

Size: 526 KB

¶1: Startup Failure Post-Mortems 2018 Third Update (11/14/2018)

¶2: Theranos

¶3: Title: Theranos is shutting down
¶4: Title Link: https://www.nytimes.com/2018/09/05/health/theranos-shutting-down.html?login=smartlock&auth=login-smartlock

¶5: Product: Theranos
¶6: Product Link: https://www.cbinsights.com/company/theranos

¶7: The New York Times wrote about the blood testing company and its plans to shutter operations:

¶8: ‘We are now out of time,’ David Taylor, the company’s chief executive and general counsel, informed investors in an email first reported on Tuesday by The Wall Street Journal, whose in-depth investigation unraveled the company’s claims. Mr. Taylor declined to comment further, saying the letter spoke for itself.

¶9: Theranos

¶10: HEALTHCARE | Medical Devices & Equipment / Patient Monitoring
¶11: theranos.com

¶12: Founded Year

¶13: 2004

Stage

Dead | Dead

Total Raised

$500M

About Theranos

Theranos is a biomedical device company working on the field of Theranostics, the integration of technology with medical therapies to deliver the RIGHT drug, in the RIGHT dose, to the RIGHT patient at the RIGHT time. Theranos aims to provide clinical decision-support systems that enable pharmaceutical companies to develop safer, more efficacious drugs for individualized patient treatment.

Theranos Headquarter Location

1701 Page Mill Road
Palo Alto, California, 94304,
United States
650-838-9292

Theranos Is Shutting Down

Title Link: https://www.nytimes.com/2018/09/05/health/theranos-shutting-down.html?login=smartlock&auth=login-smartlock

The Silicon Valley startup is expected to shutter its operations after it failed to deliver revolutionary lab-testing amid allegations of fraud.

¶29:

Image: A blood-testing machine developed by Theranos in Palo Alto.JIM WILSON/THE NEW YORK TIMES/RE, source link: https://www.wired.com/2016/10/theranos-blew-didnt-ruin-biotech-startups-everyone/

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 03-Jul-21 11:17:59 AM

Modified By: HEIDER

Size: 12 KB

¶1: Startup Failure Post-Mortems 2017 First Update (2/10/17)

¶2: Vinaya

¶3: ~~Title: A lot more wearable woe as Vinaya restructures and seeks pivot to b2b~~ **(NOT WORKING)**

¶4:

¶5: Title*: More wearable woe as Vinaya restructures and seeks pivot to b2b

¶6: Title Link*: https://techcrunch.com/2017/01/03/more-wearable-woe-as-vinaya-restructures-and-seeks-pivot-to-b2b/

¶7:

¶8: Product: Vinaya

¶9: Product Link: https://www.cbinsights.com/company/kovert-designs

¶10: Whilst we ended up going by way of the system of founding and creating a buyer electronics corporation, it grew to become apparent that the projected amount of expansion for the B2C company by yourself was unlikely to be ready to maintain the expenses linked with the

velocity of technological innovation necessary … to continue being aggressive in this space.

¶11: ## Vinaya

¶12: CONSUMER PRODUCTS & SERVICES | Consumer Electronics

¶13: vinaya.com

¶14: ### Stage

¶15: Dead | Dead

¶16: ### Total Raised

¶17: $3M

¶18: ### About Vinaya

¶19: Vinaya, previously known as Kovert Designs, is a research and design house that creates lifestyle-enhancing technology products. The company offers, Altrius, a collection of Bluetooth-enabled rings, bracelets and jewelry. When paired with the iOS app, the collection allows users to prioritize e-mails, messages and calls.

¶20: ### Vinaya Headquarter Location

¶21: 68 Hanbury Street Shoreditch

¶22: London, England, E1 5JL,

¶23: United Kingdom

¶24: 0044 0203 2818 3258

¶25:

¶26: More wearable woe as Vinaya restructures and seeks pivot to b2b

¶27: **Natasha Lomas 3:36 PM GMT+1•January 3, 2017**

¶28: Title Link*:
https://techcrunch.com/2017/01/03/more-wearable-woe-as-vinaya-restructures-and-seeks-pivot-to-b2b/

¶29: 2016 had a little more woe to deliver in the wearables space as London-based high end connected device maker, Vinaya, went into administration last month.

¶30: In a letter sent to Indiegogo backers of one of its wearables — and seen by TechCrunch — the founders also confirm the crowdfunded device will not ship. The Zenta wrist-wearable had been slated to ship this April, after the startup pulled in more

than $270,000 in July from 1,300+ backers. Early bird pre-order prices for the device started at $149.

¶31: Nor will backers receive a refund, although the letter suggests they might see some form of alternative compensation/reward in future — such as a new future product or equity in the restructured company — if it is able to get back on its feet successfully. (You can read the email sent to backers in full at the bottom of this post.)

¶32: Any backers with queries are asked to email support@vinaya.com. The company claims its existing wearables will continue to work "for the foreseeable future".

¶33: Late last week founder and CEO Kate Unsworth told BI the startup would be "restructuring" and spinning out certain parts of the business. We've contacted Unsworth and lead investor in the business, Passion Capital's Eileen Burbidge, with questions and will update this story with any response.

¶34: In a press statement about closing the company, the startup writes that a decision was made to do so last month, after which bids were invited for the assets — with the founders submitting their own bid which they say was "ultimately successful". There's no detail on how many bids were received, nor the value of the winning bid.

¶35: One of the options they say they are now considering is a pivot out of the b2c consumer tech space to focus on b2b wearables — which they describe as "potentially more scalable than the previously adopted B2C focus".

¶36: "Whilst we were going through the process of founding and building a consumer electronics company, it became apparent that the projected rate of growth for the B2C business alone was unlikely to be able to sustain the costs associated with the speed of technological innovation required in order to remain competitive in this space," writes Unsworth.

¶37: "In contrast, more generic B2B contracts can bring in revenues that are significantly higher than B2C, and the B2B business model is also more scalable," she adds. "We therefore explored a number of specific opportunities in this space, and were on the verge of signing a large contract which would have been more than sufficient to finance the company's activities. Unfortunately, there was an unexpected delay in the award of this contract, which occurred so suddenly and unexpectedly that it left a cash flow issue that was impossible to solve in the required timescales."

¶38: She goes on to claim that Vinaya's technology platform has been built "in a fully modular way, making it very adaptable" — and enabling it to be repurposed "to suit many different needs." Although she says they are now in the process of assessing their options — a process that is slated to take "some months to conclude".

¶39: "As you can imagine, there are still a number of unknowns, so we appreciate everyone's support and patience while we assess our options," she adds.

¶40: Vinaya's head of product, Dan Leitao, writing on his LinkedIn page, says the startup's first b2b business model was pitched to the Dubai Health Authority — "for creating a wearable for Dubai's citizens to provide data and insights to medical health professionals".

¶41: He also writes that he negotiated an MOU for a "custom product solution with Dubai Health Authority" — which hints at one potential b2b direction for the restructured entity; a far cry from the original consumer pitch of notification-based fashion wearables.

¶42: The startup, which was founded back in mid 2013, revealed a $3 million seed in November 2015 — with investors besides Burbidge including former Index partner Robin Klein, Carmen Busquets, Playfair Capital and Michael Birch.

¶43: At that point it also came out of stealth to discuss its first products: a range of high end wearable jewelry, in premium materials such as sterling silver and gold plating, that were designed to help people minimize screen-based distractions by routing select notifications as buzzes on wrists, fingers or collar bones.

¶44: This never looked like a mass market as we suggested at the time, querying Unsworth on how sizable a market she envisaged for these high end trinkets. "It's definitely a specific market; it's not for everybody," she responded then. Nor was it clear how many of its first range of wearables were sold, with the startup only saying it would be "a limited run".

¶45: After its debit products, Vinaya took to the Indiegogo crowdfunding platform to fund production of another device: the Zenta wrist-wearable, which appeared to be moving away from a notifications-based use-case and towards more of a mental wellness/health tracking focus.

¶46: The pitch for the bracelet was for it to track a range of physical health factors such as heart rate, perspiration, respiration and temperature, and cross-reference

them against other data from the wearer's smartphone to try to understand cause and effect and create a pattern for indicators relating to mental health such as stress levels.

¶47: Presumably this is the area the founders are now hoping to entice b2b interest from healthcare providers.

¶48: One former employee we talked to criticized "unrealistic" expectations from the Zenta crowdfunding campaign — pointing out that the funding total was inadequate to support a 40-strong team for very long.

¶49: The source claimed the internal target for the campaign had actually been £1 million — i.e. far larger than the final amount raised.

¶50: "Once the campaign ended, the atmosphere in the office turned, people started to hand in their notices," they told us.

¶51: LinkedIn indicates a large number of employees leaving Vinaya this year, many after only a few months at the company.

¶52: The source also noted the founders joined the Dubai Future Accelerators incubation program after the Indiegogo campaign — which they say led to them almost signing a b2b contract with the Dubai Health Authority. However existing investors could apparently not be convinced to keep funding the business at that point.

¶53: Safe to say, consumer hardware is hard, and wearables especially had a torrid 2016. It remains to be seen how kind 2017 will be to the category.

¶54: Below is Vinaya's email to Indiegogo backers in full.

¶55: Dear Indiegogo backer,

¶56: We've had a challenging 2 weeks. In short, the business had some unexpected, and unfortunately detrimental, cash flow issues mid-December and as a result, we had to close the company (please see this press statement for more info).

¶57: I'm incredibly disappointed that we weren't able to deliver on our vision; this has been financially painful for all our investors, and obviously very difficult for the whole VINAYA team. The group of people that I'm most disappointed for however is you; the

people, mostly complete strangers, who were excited and inspired by our vision, enough to actually give us your financial support.

¶58: I wanted to email you to update you, clarify the situation, explain what has happened over the last few weeks, and suggest a way we may be able to make it up to you:

- ¶59: When you backed our campaign, you agreed to Indiegogo's Terms and Conditions, which protect us (the company) in the event that we are unable to deliver the product, or the company has to close down.
- ¶60: Last week we had to close the company due to unforeseen circumstances. Technically we are not liable, and you are not entitled to a refund, or even the product your ordered. I understand how disappointing this must be.

¶61: Whilst there can be no guarantees at this stage, and contractual commitment isn't possible within the confines of the administration process, it is the founders' intention to find a way to repay your faith from a personal perspective if a new company structure is successful moving forward. Our intention would be to gift you new product if and when released, or alternatively award you some shares in the new company if formed, which would obviously produce a financial return in the event that the new company is profitable or sold.

¶62: As you can imagine, there are still a number of unknowns, so we appreciate your patience while we assess our options. Please bear with us while we get back on our feet – we no longer have a team to help manage everything, so updates to you may be less regular and / or less detailed, and responses to your queries may be delayed.

¶63: We will be in touch as soon as we can see a clear path forward.

¶64: Thanks again for your continued support.

¶65: The VINAYA Founders

¶66: Here's its statement:

¶67: *"The email from the Vinaya team was a mischaracterisation of Indiegogo's Terms of Use, which are in place to protect Indiegogo's backers. Our Trust and Safety team will be in contact with the Vinaya campaign owners and will attempt to recover funds. We are also committed to continuing to work with the entrepreneurs on our platform to address the challenges of bringing their ideas to market."*

¶68:

The 5 reasons why hardware startups fail

techinasia.com/talk/5-reasons-hardware-startups-fail

July 18, 2016

 Daniel Ellis · 18 Jul 2016

On July 7, 2016, Theranos CEO Elizabeth Holmes was barred from owning or running a laboratory for two years. Theranos also had its licence to operate its laboratory in California revoked.

This highly consequential decision by the US government regulator, hot on the heels of Forbes' downgrade of Theranos' valuation from $9 billion to $800 million and Ms Holmes' own net worth to zero, should come as no surprise. The company has been struggling to maintain its credibility since October 2015, when its practices and technology was first brought into question by the WSJ.

As Ms Holmes' problems mounted, she famously paraphrased Gandhi by saying, "First they think you're crazy, then they fight you, and then all of the sudden you change the world."

It seems not that long ago that Theranos was held up as the shining example of a hardware startup taking on a big, established industry. It's the latest in a series of high profile hardware startup failures that includes Coolest Cooler, Zano, Makerbot, Pirate 3D, Novelsys and Better Place. There are many others. Too many to mention in one article.

But why look into failures?

Surely there are many more success stories like Tesla, Xiaomi, and Raspberry Pi that one can rather strive to emulate?

Not so simple!

Reason being that when it comes to hardware startups, the challenges seems to be remarkably similar; for failed companies and successful ones alike. Not just that, it transcends geography and industries.

Unfortunately, mistakes tend to only reveal themselves after a startup fails, so those are the best places to look in order dissect, learn from them, and create future success.

> "At some point, everything's gonna go South on you. You're going to say 'This is it… this is how I end.' Now, you can either accept that, or you can get to work. You solve one problem, and then you solve the next problem, and the next, and if you solve enough problems, you get to go home." – Mark Watney (as played by Matt Damon in the movie The Martian)

Not all failures are created equal

Prof. Amy C. Edmondson from Harvard Business School wrote an article in 2011 that asserts not all failures are equal. She splits them up into three categories:

- Preventable failures in predictable operations
- Unavoidable failures in complex systems
- Intelligent failures at the frontier (or rather… happy accidents)

In this series, I'll be looking more deeply at five overarching, preventable failures, the lessons to learn from them and the skills needed to either avoid or recover from them.

Over the next few weeks I'll be working through detailed case studies and conduct interviews to help break down and analyse the biggest challenges hardware startups face and if circumstances makes them unavoidable, look at options how to overcome them.

Unlike most similar type articles, I'll delve deep into each topic to be as comprehensive and thorough as possible. Keep in mind that although this series focus on hardware startups, the business lessons to be learned is helpful for all founders.

Without further delay, here are the 5 reasons hardware startups fail, in no particular order.

1. Engineering/technical design issues

Here I'll show how technical issues, bad product decisions, over-promising and too many changes can delay or derail a project completely.

I'll also look at the type of testing you should be doing at each project phase.

2. Superiority bias

The traits of the typical entrepreneur can, in many cases, be seen as overconfidence, arrogance, naivety or unemployability. These traits can be either a boon or a bane for the project and the company as a whole.

We'll show how to recognize and manage said traits to further increase chances of success.

3. Timing problems

Not the dark magic many people think it is. I'll provide you with the checklist to be more sure whether the timing for your concept is right or not.

I'll also use case studies to illustrate where timing has made a deciding difference in the success of a product.

4. Poor execution

Execution can refer to Operations and Decision making or Internal Admin and Regulation. I'll discuss both separately.

I'll discuss the commercialization process in detail and point out the various pitfalls along the way. The administrative process, often seen like a necessary evil when it fact, it being a structure that supports your project and company, is a strong indicator of future business success.

5. Insufficient funding

The one we obsess most about and so very often get horribly wrong.

I'll discuss the various options of funding available to hardware startups and elaborate on ones that spare you from giving away too much equity to make your dreams come true. I'll also show you how to prepare a budget for a hardware project and work through a sample product.

There are many other reasons startups fail, but speaking from my own experience and research, these are the ones that present the highest risk that are at the same time, manageable. While I do not claim to be an expert in each of these issues, I will take the necessary effort to include data, case studies and expert opinions.

Please join in the discussion and share your own experiences. Let us all learn from each other.

This article is the first of 'The Hardware Series', where the author covers in detail why hardware startups fail.

Editing by Sim Yanting

Community Writer

Daniel Ellis

Daniel J Ellis is firstly, trained in financial management and accounting, and secondly, a tech geek who loves playing with the latest technologies and electronics boards.

Why Do Startups Fail? Because Hardware is Hard

wired.com/story/why-do-startups-fail-because-hardware-is-hard

Erin Griffith September 28, 2017

Few venture-capital investors have forgotten the story of Pebble: In 2012, after every VC firm on Sand Hill Road had passed on investing, the smartwatch startup raised more than $10 million on crowdfunding site Kickstarter. It was an unheard-of amount for a crowdfunding campaign, and the resulting hype made Pebble an internet sensation. Then the VCs, suffering from FOMO, begged Pebble to let them invest. The startup eventually raised a total of $59 million.

Investors have been loath to repeat the mistake ever since. Venture funding for hardware startups hit an eight-year high in 2016, with investors pouring $4.4 billion into 624 startups, according to data provider CB Insights.

Likewise, hardware entrepreneurs are eager to use a successful crowdfunding campaign as evidence of customer demand for their product. If tens of thousands of people are willing to donate money or pre-order a product that doesn't yet exist, surely millions will want to buy it in a store, the thinking goes. More than half of gadget startups raised their first funding on a crowdfunding website, according to CB Insights.

But it takes time and a lot of money to bring hardware to market, and in the last year a number of well-funded hardware startups have flamed out spectacularly. Wearable startup Jawbone, backed by $930 million, sold its assets earlier this year. E-cigarette company Njoy, backed by $181 million, went bankrupt last year and liquidated its assets. Kitchen appliance maker Juicero, backed by $100 million, shut down over the summer. And Fuhu, a tablet startup; Zeebo, a gaming console; and Hello, a sleep tracker; which each raised more than $50 million, have ceased operations.

Amid the failures, it's increasingly clear that crowdfunding success does not automatically equate to widespread consumer demand. A new study from CB Insights analyzes the failures of 382 hardware startups, finding that the biggest reason they fail is a lack of demand for their products. In other words, a popular crowdfunding project can be deceptive. According to the report:

> Startups are likely raising money to get to a limited release stage, and then finding that there is not a large enough market for their product to justify a larger raise and production at scale.

The study cites overspending as the second reason for failure and waning interest after an initial crowdfunding campaign as the third. On the surface, the reasons aren't too different from the reasons all startups fail. A prior report from CB Insights found that the top reason unsuccessful startup founders believe their companies failed is the lack of a market need for their product.

That may seem obvious, but the cult of entrepreneurship encourages startup founders to ignore signs that their idea won't work. Building the future around one's own vision requires a bit of irrationality. Startup mythology largely ignores failures, in favor of the rarer successes. As Steve Jobs famously said, "A lot of times, people don't know what they want until you show it to them."

It's an inspirational idea, but most startups fail to live up to it. Crowdfunding exacerbates this problem of false hope, making customer demand appear stronger than it actually is. Investors wowed by buzzy crowdfunding campaigns would do well to remember how the Pebble story ended: In December 2016, the startup shut down, selling its assets to competitor Fitbit.

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 03-Jul-21 11:30:38 AM

Modified By: HEIDER

Size: 171 KB

¶1: Startup Failure Post-Mortems 2017 First Update (2/10/17)

¶2: Angel Sensor

¶3: Title: Open source wearable Angel shuts down
¶4: Title Link:
https://www.mobihealthnews.com/content/open-source-wearable-angel-shuts-down

¶5: Product: Angel Sensor
¶6: Product Link:

https://www.mobihealthnews.com/content/open-source-wearable-angel-shuts-down

¶7: We've been through a really rough patch over these past months. We've experienced engineering and financing difficulties, downsized our R&D and fought many battles to keep the project alive.

¶8: Angel Sensor

¶9: CONSUMER PRODUCTS & SERVICES | Consumer Electronics
¶10: angelsensor.com

¶11: Stage

¶12: Dead | Dead

¶13: Total Raised

¶14: $460K

¶15: About Angel Sensor

¶16: Angel Sensor is a flexible wristband that can be worn 24/7. Angel Sensor is the only wearable designed as an open platform for mobile health. Angel Sensor tracks heart rate, blood oxygen, skin temperature, steps, sleep quality, calories, acceleration, and orientation.

¶17: Angel Sensor Headquarter Location

¶18: United States

¶19: Open source wearable Angel shuts down

¶20: By Jonah Comstock December 02, 2016 03:25 pm

¶21: Title Link:
https://www.mobihealthnews.com/content/open-source-wearable-angel-shuts-down

¶22:

¶23: Angel, a company that has been working since 2013 on an open source wearable tracker that could be programmed for different use cases, has shut down the project and, likely, the company.

¶24: The company announced the news via a large banner **on its website** reading "This project is no longer active". Angel executives did not respond to MobiHealthNews's request for an interview. Bob Troia, known as "Quantified Bob" in quantified self circles, spotted the announcement and posted about it on Twitter and on the Quantified Self forum.

¶25: "Well, looks like the Angel Sensor folks have (finally) officially thrown in the towel," **he wrote**. "Not really a surprise, as they had gone silent for nearly a year after delivering their crowdfunded product over two years late. They did release code for their open-source SDK, and there is a community of developers who have forked it on GitHub3 to continue development. Too bad they gave up, as the promise of a truly open source wearable with an array of useful sensors is lacking in the QS space."

¶26: Angel completed a well-funded Indiegogo campaign in late 2013, raising $334,000 out of an original goal of $100,000. The wristband could measure pulse, temperature, activity and blood oxygen level and was aimed at researchers, hackers, and quantified selfers.

¶27: "Angel is the first device designed with developers in mind," the company wrote on its Indiegogo page. "Currently most trackers for fitness and health are built for use by a single proprietary app. We want to change that. We are opening up communication protocols, API/SDK and sensor data streams. Ultimately, this will mean more apps to choose from."

¶28: But, as is often the case, the company ran into a number of manufacturing problems. The company's last blog post, from April 2015, lays out some of these struggles.

¶29: "We've been through a really rough patch over these past months," the company wrote. "We've experienced engineering and financing difficulties, downsized our R&D and fought many battles to keep the project alive."

¶30: It's unclear whether all of the backers even received their devices. In addition, prior to shutting down, the company was taking pre-orders for both the original wearable and a second-generation device.

¶31: The open source nature of the product means that some of the researchers that had already begun to use the device should be able to continue, though they may run into trouble if they want to scale the project or replace a defective unit. For instance, a Spanish university launched a project **using the Angel Sensor to detect epileptic seizures** just last month.

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 8:14:20 PM

Modified By: HEIDER

Size: 81 KB

¶1: Startup Failure Post-Mortems 2019 Second Update (6/19/2019)

¶2: Anki

¶3: Title: Robotics startup Anki shuts down after burning through almost $200 million

¶4: Title Link: https://venturebeat.com/2019/04/29/robotics-startup-anki-shuts-down-after-burning-through-almost-200-million/

¶5:

¶6: Product: Anki

¶7: Product Link: https://www.cbinsights.com/company/anki

¶8: Consumer AI robotics company Anki had raised over $200M from prominent investors but the company wasn't able to stay afloat after reportedly failing to attract a new round of investment or an acquirer. Anki posted a statement on its website:

¶9: It is with a heavy heart to inform you that Anki has ceased product development and we are no longer manufacturing robots. To our partners and customers, thank you for all your support and joining us on this journey to bring robotics and AI out of research labs and into your homes.

¶10: Anki

¶11: INDUSTRIAL | Machinery & Equipment / Robotics

¶12: anki.com

¶13: ## See what CB Insights has to offer
¶14: ## Founded Year
¶15: 2010

¶16: ## Stage
¶17: Asset Sale | AssetsPurchased

¶18: ## Total Raised
¶19: $205.26M

¶20: ## About Anki

¶21: Anki is harnessing robotics and artificial intelligence (AI) to bring to life consumer products with intellect and interactive capabilities.

¶22: ## Anki Headquarter Location
¶23: 55 2nd Street 15th Floor
¶24: San Francisco, California, 94105,
¶25: United States
¶26: 214-450-3701
¶27:

¶28: Robotics startup Anki shuts down after burning through almost $200 million

¶29: Kyle Wiggers
¶30: April 29, 2019 2:38 PM

¶31: Link:
https://venturebeat.com/2019/04/29/robotics-startup-anki-shuts-down-after-burning-through-almost-200-million/

¶32:

¶33: Anki's Vector robot. Image Credit: Kyle Wiggers / VentureBeat

¶34: Anki, the San Francisco startup behind AI-imbued robotics toys like Overdrive, Cozmo, and Vector, today shuttered its doors after raising close to $200 million in venture capital from Index Ventures, Two Sigma Ventures, J.P. Morgan, Andreessen Horowitz, and other investors. According to Recode, it'll lay off its entire workforce of just over 200 employees, each of whom will receive a week of severance.

¶35: A failed round of financing was reportedly to blame. CEO Boris Sofman told employees last week that a deal failed to materialize "at the last minute," as did acquisition interest from companies such as Microsoft, Amazon, and Comcast.

¶36: Anki claimed to have sold 6.5 million devices total, and 1.5 million robots last August alone. (Cozmo was the top-selling toy on Amazon in 2017 with a community of more than 15,000 developers.) And in fall 2018, the company revealed that revenue was close to $100 million in 2017, a figure it expected to beat the subsequent year.

¶37: "Despite our past successes, we pursued every financial avenue to fund our future product development and expand on our platforms," a company spokesperson told Recode. "[We were left] without significant funding to support a hardware and software

business and bridge to our long-term product roadmap … We're doing our best to take care of every single employee and their families, and our management team continues to explore all options available."

¶38: Anki, which was founded by Mark Palatucci, Sofman, and Hanns Tappeiner in 2010 with the mission of "bring[ing] artificial intelligence and robotics into [users'] daily lives," made a splash six years ago with its smartphone-controlled car set Anki Drive (alternatively Anki Overdrive), which was demonstrated onstage at Apple's 2013 WorldWide Developer Conference. Anki later became an Apple retail partner and introduced several Overdrive accessories, including a series with Hot Wheels branding.

¶39: Cozmo — a cute robot toy that made use of Anki's company's deep artificial intelligence research and team of Pixar and Dreamworks animators — debuted in October 2016, ahead of Vector. But despite their novelty and sophistication, the robots shared relatively high launch price points ($180 for Cozmo and $249 for Vector), which likely contributed to their slow uptake in the notoriously unforgiving consumer robotics space.

¶40: Anki's closure follows the shuttering of Bosch-backed startup Mayfield Robotics, which was developing a larger, pricier ($700) home robot dubbed Kuri. Robotics company Jibo, which engineered a social robot featuring a bespoke conversational assistant, shut down earlier this year. In somewhat related news, industrial robotics company Rethink Robotics closed its doors seven months ago after attempting unsuccessfully to find an acquirer.

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 03-Jul-21 11:52:10 AM

Modified By: HEIDER

Size: 16 KB

¶1: Startup Failure Post-Mortems 2017 Second Update (6/9/17)

¶2: AOptix Technologies

¶3:

¶4: Title: It's Lights Out for AOptix

¶5: Title Link: https://www.lightreading.com/mobile/backhaul/exclusive-its-lights-out-for-aoptix/d/d-id/720915

¶6:

¶7: Product: AOptix Technologies

¶8: Product Link: https://www.cbinsights.com/company/aoptix

¶9: Long-time Free-Space Optics (FSO) player AOptix has shut up shop and is selling off its assets at auction next week… the company is currently trying to shop around its intellectual property.

¶10: A source tells Light Reading that AOptix's hybrid radio-FSO units were expensive, selling for up to $80,000 a link. Carriers in the US and beyond are looking at wireless backhaul as alternative to fiber, but the expectation is that it should be cheaper and easier to install as well.

¶11: AOptix Technologies

¶12: COMPUTER HARDWARE & SERVICES | Specialty Computer Hardware

¶13: aoptix.com

¶14: Founded Year

¶15: 2000

¶16: Stage

¶17: Dead | Dead

¶18: Total Raised

¶19: $113.64M

¶20: About AOptix Technologies

¶21: AOptix Technologies is a commercial developer of Adaptive Optics (AO) technology. Through the combination of iris recognition and other biometrics techniques, the company's identity solutions deliver fast, easy and accurate identification and verification for a wide range of applications including automated boarding and immigration at airports and international borders. Its communications solutions deliver reliable, long-range, ultra-high bandwidth wireless communications to alleviate mobile backhaul congestion and other network chokepoints. Its solutions are derived from the company's optical technologies originally developed for scientific research and further developed with DARPA for advanced defense applications.

¶22: AOptix Technologies Headquarter Location

¶23: 695 Campbell Technology Parkway
¶24: Campbell, California, 95008,
¶25: United States
¶26: 408-558-3303
¶27:

¶28: Exclusive: It's Lights Out for AOptix

¶29: DAN JONES, Mobile Editor2/5/2016

¶30: Link:
https://www.lightreading.com/mobile/backhaul/exclusive-its-lights-out-for-aoptix/d/d-id/720915

¶31: Long-time Free-Space Optics (FSO) player AOptix has shut up shop and is selling off its assets at auction next week, Light Reading has learned.

¶32: Two industry sources told us that the company is ceasing operations this month. Light Reading has been told that the company is currently trying to shop around its intellectual property. Whatever happens with an IP sale, the company is *definitely* auctioning off the contents of its Campbell, Calif., headquarters next Wednesday. One source tells us that all employees "are gone" already.

¶33: Light Reading tried to reach the company Friday afternoon, but all calls were directed to voicemail. The company is also no longer being represented by its former public relations firm, Lewis PR, which was last listed as a contact in November 2015.

¶34: AOptix first started as a well-funded FSO startup in 2000. After the telecom bubble deflated, it built 80Gbit/s air-to-air and air-to-ground links for the Defense Advanced Research Projects Agency (DARPA) and the US Air Force. (See AOptix Gets $18M and AOptix Raises $12.9M.)

¶35: In 2011, the company took that military know-how and developed a combined millimeter wave (mmWave) radio and optical product for wireless backhaul. In 2012, it closed $42 million in Series E funding. (See AOptix Rejoins the Backhaul Bandwagon.)

¶36: In January 2015, AOptix appointed former Brocade Communications Systems Inc. (Nasdaq: BRCD) CEO Michael Klayko as its new chief executive "through its next stage of rapid growth" as the company received a further round of extra investment. (See Brocade Names New CEO.)

¶37: In total, the company is said to received up to $150 million from investors. Once source says that AOptix recieved a $45 million round in the summer of 2015.

¶38: The company had appeared to be advancing its wireless broadband push, winning a "Cool Vendor" award from Gartner Inc. , and a "Fierce 15" startup accolade in 2015. AOptix's last announced deal was a trial to unwire Hong Kong with local company, Top Express, unveiled in September 2015. (See Magic Quadrant or Gartner 'Graft'? and Meet the Queen of Laser Radio Tech.)

¶39: A source tells Light Reading that AOptix's hybrid radio-FSO units were expensive, selling for up to $80,000 a link. Carriers in the US and beyond are looking at wireless backhaul as alternative to fiber, but the expectation is that it should be cheaper and easier to install as well.

¶40: We'll update this story if we get any more details on the fate of AOptix.

¶41: — Dan Jones, Mobile Editor, Light Reading

¶42:

¶43:

¶44: 

¶45: image: AOptix Technologies Completes Air Force Flight Test Program Of Laser Communications System, from: https://www.photonicsonline.com/doc/aoptix-technologies-completes-air-force-0002

¶46:

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 9:20:18 PM

Modified By: HEIDER

Size: 86 KB

¶1: Startup Failure Post-Mortems 2017 Second Update (6/9/17)

¶2: Aquion Energy

¶3: Title: Aquion Energy Files For Chapter 11 Bankruptcy

¶4: Title Link: https://cleantechnica.com/2017/03/15/aquion-energy-files-chapter-11-bankruptcy/

¶5: Product: Aquion Energy

¶6: Product Link: https://www.cbinsights.com/company/aquion-energy

¶7: Company CEO, Scott Pearson, commented: “Creating a new electrochemistry and an associated battery platform at commercial scale is extremely complex, time-consuming, and very capital intensive. Despite our best efforts to fund the company and continue to fuel our growth, the Company has been unable to raise the growth capital needed to continue operating as a going concern.

¶8: Aquion Energy

¶9: ELECTRONICS | Electrical Product Distribution / Power Generation & Storage

¶10: aquionenergy.com

¶11: Founded Year

¶12: 2008

¶13: Stage

¶14: Acquired | Acquired

¶15: Total Raised

¶16: $196.63M

¶17: Valuation

¶18: $0000

¶19: About Aquion Energy

¶20: Aquion Energy is the manufacturer of proprietary Aqueous Hybrid Ion (AHI) batteries and battery systems for long-duration stationary energy storage applications. AHI batteries are optimized for daily deep cycling for residential solar, green architecture, off-grid and microgrid, energy management, and grid-scale applications. Aquion's high-performance, safe, sustainable and cost-effective batteries deliver reliability and value for customers. The company's battery systems provide flexible, modular energy storage that enables broad adoption of renewable energy technologies such as wind and solar, reduced reliance on fossil fuels, and optimization of existing grid-tied generation assets.

¶21: Aquion Energy Headquarter Location

¶22: 32 39th Street
¶23: Pittsburgh, Pennsylvania, 15201,
¶24: United States
¶25: 412-904-6400
¶26:

¶27: Aquion Energy Files For Chapter 11 Bankruptcy

¶28: The battery technology and manufacturing firm Aquion Energy — well known for its Aqueous Hybrid Ion (AHI) energy storage and battery systems — has filed a voluntary petition under Chapter 11 of the United States Bankruptcy Code in the United States Bankruptcy Court of the District of Delaware, according to recent reports.
¶29: By James Ayre Published March 15, 2017
¶30: Title Link:
https://cleantechnica.com/2017/03/15/aquion-energy-files-chapter-11-bankruptcy/
¶31:

¶32: The battery technology and manufacturing firm Aquion Energy — well known for its Aqueous Hybrid Ion (AHI) energy storage and battery systems — has filed a voluntary petition under Chapter 11 of the United States Bankruptcy Code in the United States Bankruptcy Court of the District of Delaware, according to recent reports.

¶33: The firm's plan is apparently to use the filing to create enough time to, in an orderly way, set up the sale of its assets.

¶34: Previous to the filing, the company reportedly fired around 80% of its workforce (some of whom are now in consulting agreements with the firm relating to the sale of its assets), and ceased all of its manufacturing, sales, and marketing operations.

¶35: Company CEO, Scott Pearson, commented: "Creating a new electrochemistry and an associated battery platform at commercial scale is extremely complex, time-consuming, and very capital intensive. Despite our best efforts to fund the company and continue to fuel our growth, the Company has been unable to raise the growth capital needed to continue operating as a going concern."

¶36: The Virginia-based consulting firm Protiviti is reportedly helping with the bankruptcy filing.

¶37: Notably, there are "several" parties that have reportedly expressed interest in acquiring Aquion Energy.

¶38: *Green Car Congress* provides more: "In the coming weeks, Aquion will be working to secure a bidder to purchase substantially all of its operating assets. The company then intends to seek approval from the Bankruptcy Court for a competitive bidding and auction process to offer other interested bidders an opportunity to win the right to purchase the assets of the company."

¶39: And a bit of background: "In 2007, with support from Carnegie Mellon University, Dr Jay Whitacre began researching low-cost electrochemical approaches to bulk energy storage. In 2008 he produced the first functioning Aqueous Hybrid Ion (AHI) battery. Supported by VC funding, Aquion spun out of CMU in 2009. Aquion began low volume production in the summer of 2011 and broke ground on full-scale manufacturing facility in nearby Mt. Pleasant, PA in 2012. Aquion has been shipping commercially since mid-2014."

¶40: We've been covering Aquion for years, and it is one of the innovative battery companies that seemed to possess the most promise (for stationary storage). But it is a tough market. Here are a handful of stories we've published on Aquion over the years:

¶41: Aquion Energy, Schneider Electric, & Azimuth Energy Finish Innovative AC/DC Hybrid Nanogrid

¶42: Tesla Powerwall & Powerpacks Per-kWh Lifetime Prices vs Aquion Energy, Eos Energy, & Imergy

¶43: Innovative Battery Startup Aquion Brings In $55 Million From Bill Gates & Others

¶44: Bill Gates Provides Boost To Renewable Energy Storage Company Aquion Energy

¶45: Aquion Energy Aqueous Hybrid Ion Battery Is Cradle To Cradle

¶46: We'll keep you posted on what happens next. … It sounds like there are numerous companies that are serious about acquiring Aquion's assets.

¶47:

¶48:

¶49:

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 9:30:49 PM

Modified By: HEIDER

Size: 3 KB

¶1: Startup Failure Post-Mortems 2014 Second Update (9/24/2014)

¶2: Berg

~~¶3:~~ ~~Title: Week 483~~ **(NOT WORKING)**

¶4: Product: Berg

¶5: Product Link:

¶6: We've not reached a sustainable business in connected products. But: There's our troop!

¶7: Cultural inventions! I'm proud of this British Experimental Rocket Group. Thank you fellow travellers, in your thousands. Behind the mountains, there are more mountains.

¶8: Berg

¶9: FOOD & BEVERAGES | Alcoholic Beverages

¶10: bergliquorcontrols.com

¶11: About Berg

¶12: Berg manufactures a complete range of beverage and liquor control systems for liquor, beer, wine, and other beverages. It is based in Monona, Wisconsin.

¶13: Berg Headquarter Location

¶14: 2160 Industrial Drive

¶15: Monona, Wisconsin, 53713,

¶16: United States

The 5 reasons why hardware startups fail

techinasia.com/talk/5-reasons-hardware-startups-fail

July 18, 2016

 Daniel Ellis · 18 Jul 2016

On July 7, 2016, Theranos CEO Elizabeth Holmes was barred from owning or running a laboratory for two years. Theranos also had its licence to operate its laboratory in California revoked.

This highly consequential decision by the US government regulator, hot on the heels of Forbes' downgrade of Theranos' valuation from $9 billion to $800 million and Ms Holmes' own net worth to zero, should come as no surprise. The company has been struggling to maintain its credibility since October 2015, when its practices and technology was first brought into question by the WSJ.

As Ms Holmes' problems mounted, she famously paraphrased Gandhi by saying, "First they think you're crazy, then they fight you, and then all of the sudden you change the world."

It seems not that long ago that Theranos was held up as the shining example of a hardware startup taking on a big, established industry. It's the latest in a series of high profile hardware startup failures that includes Coolest Cooler, Zano, Makerbot, Pirate 3D, Novelsys and Better Place. There are many others. Too many to mention in one article.

But why look into failures?

Surely there are many more success stories like Tesla, Xiaomi, and Raspberry Pi that one can rather strive to emulate?

Not so simple!

Reason being that when it comes to hardware startups, the challenges seems to be remarkably similar; for failed companies and successful ones alike. Not just that, it transcends geography and industries.

Unfortunately, mistakes tend to only reveal themselves after a startup fails, so those are the best places to look in order dissect, learn from them, and create future success.

> "At some point, everything's gonna go South on you. You're going to say 'This is it… this is how I end.' Now, you can either accept that, or you can get to work. You solve one problem, and then you solve the next problem, and the next, and if you solve enough problems, you get to go home." – Mark Watney (as played by Matt Damon in the movie The Martian)

Not all failures are created equal

Prof. Amy C. Edmondson from Harvard Business School wrote an article in 2011 that asserts not all failures are equal. She splits them up into three categories:

- Preventable failures in predictable operations
- Unavoidable failures in complex systems
- Intelligent failures at the frontier (or rather… happy accidents)

In this series, I'll be looking more deeply at five overarching, preventable failures, the lessons to learn from them and the skills needed to either avoid or recover from them.

Over the next few weeks I'll be working through detailed case studies and conduct interviews to help break down and analyse the biggest challenges hardware startups face and if circumstances makes them unavoidable, look at options how to overcome them.

Unlike most similar type articles, I'll delve deep into each topic to be as comprehensive and thorough as possible. Keep in mind that although this series focus on hardware startups, the business lessons to be learned is helpful for all founders.

Without further delay, here are the 5 reasons hardware startups fail, in no particular order.

1. Engineering/technical design issues

Here I'll show how technical issues, bad product decisions, over-promising and too many changes can delay or derail a project completely.

I'll also look at the type of testing you should be doing at each project phase.

2. Superiority bias

The traits of the typical entrepreneur can, in many cases, be seen as overconfidence, arrogance, naivety or unemployability. These traits can be either a boon or a bane for the project and the company as a whole.

We'll show how to recognize and manage said traits to further increase chances of success.

3. Timing problems

Not the dark magic many people think it is. I'll provide you with the checklist to be more sure whether the timing for your concept is right or not.

I'll also use case studies to illustrate where timing has made a deciding difference in the success of a product.

4. Poor execution

Execution can refer to Operations and Decision making or Internal Admin and Regulation. I'll discuss both separately.

I'll discuss the commercialization process in detail and point out the various pitfalls along the way. The administrative process, often seen like a necessary evil when it fact, it being a structure that supports your project and company, is a strong indicator of future business success.

5. Insufficient funding

The one we obsess most about and so very often get horribly wrong.

I'll discuss the various options of funding available to hardware startups and elaborate on ones that spare you from giving away too much equity to make your dreams come true. I'll also show you how to prepare a budget for a hardware project and work through a sample product.

There are many other reasons startups fail, but speaking from my own experience and research, these are the ones that present the highest risk that are at the same time, manageable. While I do not claim to be an expert in each of these issues, I will take the necessary effort to include data, case studies and expert opinions.

Please join in the discussion and share your own experiences. Let us all learn from each other.

This article is the first of 'The Hardware Series', where the author covers in detail why hardware startups fail.

Editing by Sim Yanting

Community Writer

Daniel Ellis

Daniel J Ellis is firstly, trained in financial management and accounting, and secondly, a tech geek who loves playing with the latest technologies and electronics boards.

Created On: 05-Jan-22 9:29:50 PM

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Size: 9 KB

¶1: Startup Failure Post-Mortems 2015 First Update (8/15/2015)

¶2: Calxeda

¶3: Title: Low power won't bag ARM the server crown

¶4: Title Link: https://www.theregister.com/2014/01/08/calxeda_postmortem/

¶5: Product: Calxeda

¶6: Product Link: https://www.cbinsights.com/company/calxeda

¶7: In [Calxeda's] case, we moved faster than our customers could move. We moved with tech that wasn't really ready for them – ie, with 32-bit when they wanted 64-bit. We moved when the operating-system environment was still being fleshed out – [Ubuntu Linux maker] Canonical is all right, but where is Red Hat? We were too early.

¶8: Founded Year

¶9: 2008

¶10: Stage

¶11: Dead | Dead

¶12: Total Raised

¶13: $104.75M

About Calxeda

Calxeda, formerly Smooth-Stone, brings new performance density to the datacenter on an attractive power foot print by leveraging ultra-low power processors as used on mobile phones as a foundation for its technology. Calxeda will make it possible for datacenter managers to increase the density of computer resources while reducing the need for power, space and cooling.

Calxeda Headquarter Location

7000 North Mopac Expressway Suite 250
Austin, Texas, 78731,
United States

Low power WON'T bag ARM the server crown. So here's how to upset Intel

Ex-veep spills beans on where chip upstart Calxeda went wrong Jack Clark in San Francisco Wed 8 Jan 2014 // 10:29 UTC

Title Link: https://www.theregister.com/2014/01/08/calxeda_postmortem/

EXCLUSIVE In the last days of 2013, Calxeda, the ambitious startup that hoped to design ARM processors for data-center servers, imploded.

Now *El Reg* has sifted its ashes, and pulled out some advice for the silicon upstart's contemporaries.

The demise of Calxeda caused many to ponder the viability of general-purpose ARM-powered computing in the data center, especially given Intel's twin threats of its custom chip business and a newfound dedication to shrinking the power consumption of its Avoton server chips.

Calxeda's plan was to design chip packages that combined its network fabric electronics and other controllers with processor cores licensed from ARM; the resulting blueprints would turned into working silicon by outside fabs, and used in kit from the likes of HP. The startup's low-power ECX-1000 used the quad-core 32-bit Cortex-A9 architecture; the ECX-2000 used the Cortex-A15.

¶31: But 64-bit parts, desirable for enterprise-grade workloads, weren't scheduled for release until 2014, a date the company just couldn't reach before the lights were switched off.

¶32: Last night, *El Reg* approached Karl Freund, Calxeda's former veep of marketing, and he told us about what other ARM-powered startups can do to avoid Calxeda's fate, and why major adoption of the chips is likely, but not for the power-consumption reasons promulgated by the press.

¶33: "In high tech, we are all trained by the years of the dot-com boom to think that being first to market is critical," said Freund, who is now an independent analyst and consultant on ARM servers.

¶34: "In [Calxeda's] case, we moved faster than our customers could move. We moved with tech that wasn't really ready for them – ie, with 32-bit when they wanted 64-bit. We moved when the operating-system environment was still being fleshed out - [Ubuntu Linux maker] Canonical is all right, but where is Red Hat? We were too early."

¶35: Calxeda's folly, Freund reckoned, was that it came out early enough to ignite a huge amount of interest from the industry and coverage in the media, but was too early to satisfy key customers with serious spending power.

¶36: Though large-scale operators such as Google and Facebook are all interested in ARM-driven servers – a senior Facebook executive joined Calxeda's board in October – they are all going to wait until 64-bit ARMv8 packages are available, Freund reckoned, and will likely want some kind of software ecosystem to be present as well.

¶37: Chips stuffed with 64-bit ARM cores are expected to come along in the first months of this year, though Freund believes it will be in 2015 that the industry adopts the architecture in a big way.

¶38: In the year between release and adoption, in a sense we'll witness a Mexican standoff: the IT world's superstars won't run production systems on computers until they're demonstrated reliably running critical software. Someone will have to crack and take a shot on the platform before others invest time and money in testing and validate their applications for wide ARMv8 deployment.

¶39: "The big guys, they'll all experiment with ARM, many of them will deploy ARM, but not until first-generation 64-bit at best," Freund said.

¶40: "These guys have advanced technology strategists so they're always looking at what's next on the horizon. We have had deep, deep discussions with all of them about our technology and about our roadmap. They're all going to wait for 64-bit.

¶41: "Red Hat will not have [an ARM] RHEL until 2015 at the earliest. If you're an Amazon you're not going to stand up a big farm of ARM servers if there's nobody running a big load of software on ARM."

¶42: The reason ARM will be successful is not performance per watt

¶43: ARM-compatible processors tend to end up in handheld devices, and thus aren't as battery hungry as their x86 cousins. In these eco-friendly times, the suggestion you could run an ARM server farm off, say, a solar panel array was enticing for companies with hefty electricity bills.

¶44: If power-sipping 64-bit ARMv8 server chips have a chance of serious adoption in the data center come 2015, there's a good chance Intel will at that time be fielding some capable Atom processors with close-to-ARM milliwatt-per-MHz ratings thanks to Chipzilla's advanced manufacturing expertise.

¶45: Freund says this is "a very cogent argument," and claimed somewhat heretically that "the reason ARM will be successful is not lower performance per watt."

¶46: A minor performance-per-watt advantage (and by 2015 all signs point to it being minor at best) is not great enough to get people to switch architectures, he said.

¶47: Instead, the flexibility of the ARM architecture will be vital – specifically, the freedom to license a streamlined ARM core design and bolt on whatever custom hardware is needed to perform or accelerate a particular task. This approach contrasts Intel's beefy but general-purpose packages.

¶48: Just as smartphone makers turn to system-on-chips with touchscreen-driving GPUs and wireless networking built alongside battery-friendly processor cores, server manufacturers should be able to pick up parts that strongly glue multiple cores to gigabit ethernet and high-end SATA controllers.

¶49: "It's the ability to customize around ARM's intellectual property, which you cannot do with Intel intellectual property," Freund told us. "If you're Google looking at some kind of acceleration, or Sandia Labs looking at very specific algorithms you want to tune for, or you like the [Calxeda] fabric and want disaggregated resource models – that's why you pick ARM."

¶50: This lines up with *El Reg's* own analysis in December, and the thoughts of a well-placed source within the semiconductor industry.

¶51: Though Intel has an early-stage custom x86 chip business that already works with eBay and Facebook, Freund believes the pace at which a company can either buy

and modify ARM chips, or contract to a third party like a Phoenix-rebirthed Calxeda to do so, will beat Intel every time.

¶52: "Either customize for a very large account or customize for a very specific workload or market segment," he said. "My advice to other ARM vendors - I wish them all the luck - is you either have to add significant added-value or very, very low costs."

¶53: Pay attention, Applied Micro's "X-Gene" team, and AMD's "Seattle" crew, or else you risk a dim reception to your promises of future chippery. ®

¶54: Bootnote

¶55: Intel experimented with ARM-compatible system-on-chips called the Xscale family between 2002 and 2006, at which point it offloaded the tech to Marvell. Chipzilla pitched the processors at mobile phones, networking kit, disk controllers and similar embedded computing products. Calxeda clearly thought bolting cores onto specialized hardware was the way to go: its co-founder Barry Evans once ran Intel's Xscale businesses.

¶56:

¶57:

The 5 reasons why hardware startups fail

techinasia.com/talk/5-reasons-hardware-startups-fail

July 18, 2016

 Daniel Ellis · 18 Jul 2016

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Created By: HEIDER

Modified On: 02-Jul-21 9:45:14 PM

Modified By: HEIDER

Size: 231 KB

¶1: Startup Failure Post-Mortems 2016 Third Update (11/8/16)

¶2: Electroloom

¶3: Title: Thanks and farewell
¶4: Title Link:
https://medium.com/electroloom-blog/thanks-and-farewell-b0c128c3043f#.q07v6nhu3

¶5: Product: Electroloom
¶6: Product Link: https://www.cbinsights.com/company/the-electroloom

¶7: The bottom line is that we simply do not have the financial ability to continue supporting the company … The reality is that a lot of events factored into our inability to raise: slow technical progress, significant scientific risk, a lack of an MVP, and a poorly defined market opportunity.

¶8: Electroloom

¶9: CONSUMER PRODUCTS & SERVICES | Consumer Electronics
¶10: electroloom.com

¶11: Stage

¶12: Dead | Dead

¶13: Total Raised

¶14: $90K

¶15: About Electroloom

¶16: Electroloom is a 3D printer for clothes capable of creating nonwoven fabrics on unique and complex structures. The Electroloom makes the design and manufacturing of clothing more accessible through a desktop device.

¶17: Electroloom Headquarter Location

¶18: San Francisco, California,
¶19: United States
¶20:

¶21:

¶22:

¶23: Thanks and farewell

¶24: Aaron Rowley Follow Aug 10, 2016 · 3 min read

¶25: Title Link:
https://medium.com/electroloom-blog/thanks-and-farewell-b0c128c3043f#.q07v6nhu3

¶26:

¶27: An image of our earliest fabric prototype from 2013, when we first started the project

¶28: Hi everyone, we're writing this post with heavy hearts to let you know that we are making the tough decision to shut down Electroloom.

¶29: The bottom line is that we simply do not have the financial ability to continue supporting the company. We were previously funded through a mixture of venture capital and government grants. Despite our best efforts (for over one year), we have been unable to raise a new round. We have made big changes

throughout 2016 in hopes of reducing our burn rate, but without additional capital, we are unable to keep the company afloat. We suffered a lot of problems and mistakes that led us here, perhaps too many to outline in detail. The reality is that a lot of events factored into our inability to raise: slow technical progress, significant scientific risk, a lack of an MVP, and a poorly defined market opportunity.

¶30: Although it is difficult to say goodbye, we recognize that we have learned a great deal. One thing that stands out as obvious from our experience running Electroloom is that people are hungry for and believe in dramatic changes for the apparel industry. Whether it is to help people express themselves creatively through new and powerful design tools, or to help implement more sustainable manufacturing methods, we have seen the emergence of a new segment of people who care about the future of textiles and clothing. We feel quite fortunate to have played a role in this global conversation.

¶31: The vision we have does not end here. There are other incredible ventures in this space that are actively working on changing the landscape of apparel and manufacturing. We wanted to provide a brief list of some of the projects we find to be pretty stellar, in hopes that you continue to stay tuned-in to the industry.

¶32: Our favorites:

1. ¶33: Kniterate: A 3D Knitwear Printer. This crew got their start around the same time that we did several years ago, and we've been keeping in touch. Their demos are super impressive and they are going to have exciting announcements in 2016 and beyond.

2. ¶34: Disney: Check out their video regarding building a compiler for industrial knitting machines. Their software might power future on-demand apparel manufacturing tools by translating digital designs into physical goods.

3. ¶35: Unmade: Their quote says it best. "We hold no stock — nothing exists until you place your order and the production process begins." They use industrial knitting machines to produce unique, customizable clothes that are made-to-order.

4. ¶36: Ambercycle: We had an awesome conversation with the founder regarding their polyester recycling process. This has the potential to recycle waste polyester so that it is virtually indistinguishable from virgin polyester.

5. ¶37: Bolt Threads: Working on scaling up a new method for manufacturing silk thread. This opens up an exciting world of material properties for apparel.

6. ¶38: JUST: Accumulating detailed environmental and manufacturing information of brands in hopes of making the

apparel industry more transparent and accountable. They list the pros and cons of some of the world's largest brands.

¶39: We would like to thank each and every one of you for supporting us on this journey. To our advisors, investors, mentors, and employees: thank you for your guidance and for believing in us. To our backers, customers, and supporters along the way: we can't put into words how appreciative we are of you. Please don't hesitate to reach out to us at founders@electroloom.com if you have any lingering questions.

¶40: With gratitude,

¶41: Aaron + Joe

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 9:54:05 PM

Modified By: HEIDER

Size: 94 KB

¶1: Startup Failure Post-Mortems 2020 Second Update (8/18/20)

¶2: Essential Products

¶3: Title: Essential, Andy Rubin's phone company, is shutting down
¶4: Title Link: https://www.theverge.com/2020/2/12/21134985/essential-phone-shutting-down-andy-rubin-startup

¶5: Product: Essential Products
¶6: Product Link: https://www.cbinsights.com/company/essential

¶7: Consumer hardware startup Essential closed down in February 2020, following the flop of its Essential Phone launched in 2017 and other unfinished projects. Founded by Andy Rubin, the creator of Android, the startup drew significant interest, raising over $330M. However, after a 2018 New York Times report revealed that Rubin had allegedly left Google due to sexual misconduct allegations, attention to the startup cooled. According to The Verge,

¶8: Essential was in the process of developing another phone called "Project Gem" with an unusual design. Rubin first teased the project in October 2019, but the company now says it has "no clear path to deliver it to customers."

¶9: "Given this, we have made the difficult decision to cease operations and shutdown Essential," the company writes in a blog post.

¶10: # Essential Products

¶11: CONSUMER PRODUCTS & SERVICES | Consumer Electronics

¶12: essential.com

¶13: Founded Year

¶14: 2015

¶15: Stage

¶16: Asset Sale | AssetsPurchased

¶17: Total Raised

¶18: $330M

¶19: About Essential Products

¶20: Essential Products is a company focused on creating consumer technology products for the 21st century. Founded by Andy Rubin, co-founder of Android, Essential Products is headquartered in Palo Alto, California.

¶21: Essential Products Headquarter Location

¶22: 380 Portage Avenue

¶23: Palo Alto, California, 94306,

¶24: United States

¶25: 650-300-0000

¶26:

¶27: Es¶28: sential, Andy Rubin's phone company, is shutting down

Th¶29: e phone startup is done after one flop

By¶30: Jacob Kastrenakes @jake_k Feb 12, 2020, 1:19pm EST

Ti¶31: tle Link: https://www.theverge.com/2020/2/12/21134985/essential-phone-shutting-down-andy-rubin-startup

¶32:

Ph¶33: oto by Vjeran Pavic / The Verge

Es¶34: sential is shutting down less than three years after the startup unveiled its first smartphone. The company's only complete product, the Essential Phone, sold poorly and received mixed reviews. A follow-up phone was canceled, and a number of other promised devices — like a smart home assistant and operating system — never materialized.

The startup was founded by Android creator Andy Rubin. While that initially drew hype and investment, it quickly turned backward on the company after a *New York Times* report drew attention to accusations of sexual misconduct against Rubin that allegedly led to him leaving Google.

Essential was in the process of developing another phone called "Project Gem" with an unusual design. Rubin first teased the project in October 2019, but the company now says it has "no clear path to deliver it to customers."

"Given this, we have made the difficult decision to cease operations and shutdown Essential," the company writes in a blog post.

Essential is done issuing updates for the Essential Phone, though it says the device will continue to work. Newton Mail, which Essential bought in late 2018, will also be shut down. Essential says it will continue to operate through April 30th.

The news is supposed to have no impact on Playground Global, a VC firm Rubin founded that shares the same office space as Essential, according to an Essential spokesperson. A Playground spokesperson said the firm is "proud to have supported" the team even though "commercial success was elusive."

When Essential debuted its first phone in 2017, it seemed to have a lot going for it. The device had a premium build quality, the backing of Android's creator, and a unique nearly all-screen design with a cutout camera notch that hadn't been seen before.

But the phone's design very quickly became standard fare — the iPhone X was released just months later, and a wave of notch knock-offs followed. And the Essential Phone itself wasn't helped by some faults of its own: it was a Sprint exclusive in the US, confining it to the smallest nationwide carrier, and its camera was widely criticized by reviewers.

Essential also promised a wave of accessories for a magnetic module system built into the phone, but only two materialized: a 360-degree camera and a headphone jack adapter, which sold for $149.

Even as the startup struggled with sales and development of new devices, it continued to support its original phone. Six months after launch, it put out three new color options, and the company continued to regularly update the phone's software. As recently as September 2019, it was updated to Android 10 on day one of the operating system's release.

Unable to break into the phone market with a traditional device, Essential started developing a much quirkier new device, seemingly hoping to strike a chord with consumers. It was never entirely clear what Project Gem would be good for, though. And apparently, Essential lacked the money — and interest from investors — to get it to market.

Why Do Startups Fail? Because Hardware is Hard

wired.com/story/why-do-startups-fail-because-hardware-is-hard

Erin Griffith September 28, 2017

Few venture-capital investors have forgotten the story of Pebble: In 2012, after every VC firm on Sand Hill Road had passed on investing, the smartwatch startup raised more than $10 million on crowdfunding site Kickstarter. It was an unheard-of amount for a crowdfunding campaign, and the resulting hype made Pebble an internet sensation. Then the VCs, suffering from FOMO, begged Pebble to let them invest. The startup eventually raised a total of $59 million.

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Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 10:01:11 PM

Modified By: HEIDER

Size: 5 KB

¶1: Startup Failure Post-Mortems 2017 Third Update (10/31/17)

¶2: Hello

¶3: Title: Goodbye, Hello.

¶4: Title Link: https://medium.com/@hello/goodbye-hello-c62ea1f58d13

¶5: Product: Hello's Sense smart sleep sensor

¶6: Product Link: https://www.cbinsights.com/company/hello

¶7: It's with a heavy heart that I share with you the news that Hello will soon be shutting down. The past few weeks we have been working hard to find the right home for Sense and we are still focused on that.

¶8: When we first launched Sense, sleep was one of the most neglected part of our lives. Three years later, for many, it is now rightly recognised as perhaps the most important pillar of our health and wellness, alongside exercise and diet. I am incredibly happy that we were able to play a small part in changing the conversation around sleep.

¶9: The past few months have been incredibly tough, especially on the team of Hello. For that I'm incredibly sorry.

¶10: Hello
¶11: CONSUMER PRODUCTS & SERVICES | Consumer Electronics
¶12: hello.is

¶13: Stage
¶14: Dead | Dead

¶15: Total Raised
¶16: $52.92M

¶17: About Hello
¶18: Hello is the developer of Sense, a smart sleep sensor. Sense is a sleep tracking device that measures temperature, humidity and ambient light.

¶19: Hello Headquarter Location
¶20: 1660 17th Street
¶21: Daly City, California, 94017,
¶22: United States
¶23: 415-937-2303
¶24:

¶25: Goodbye, Hello.

¶26: By Hello,

¶27: Link: https://medium.com/@hello/goodbye-hello-c62ea1f58d13

¶28: It's with a heavy heart that I share with you the news that Hello will soon be shutting down. The past few weeks we have been working hard to find the right home for Sense and we are still focused on that. There will be lots of questions to which I don't currently have the answers. As soon as I know, I will update everyone. I am sorry for not being able to answer every question immediately, but I will endeavor to do so as fast as possible.

¶29: I am incredibly thankful of what the whole team built with Sense, but I am even more honoured to have worked with the team that we built at Hello. I couldn't have asked to have worked

with a more talented group of people and will miss that more than anything. I am also eternally grateful for everyone who has ever used and loved Sense. It was my honour to be able to build something that you welcomed into your lives.

¶30: When we first launched Sense, sleep was one of the most neglected part of our lives. Three years later, for many, it is now rightly recognised as perhaps the most important pillar of our health and wellness, alongside exercise and diet. I am incredibly happy that we were able to play a small part in changing the conversation around sleep.

¶31: The past few months have been incredibly tough, especially on the team of Hello. For that I'm incredibly sorry.

¶32: I would like to thank all of our customers, investors, partners, and team for supporting us through this journey. Hello has been my whole life for five years and I couldn't have asked for a better group of people to have travelled with.

¶33: James

¶34: **Will Sense shut down?**

¶35: We are still unsure, but working hard to ensure that it does not.

¶36: **Will I be able to export all of my data from Sense and/or delete my account?**

¶37: Yes, an email will go to everyone by the end of the week with instructions.

¶38: **Will I be able to get a refund?**

¶39: If you purchased Sense directly from Hello, you we will not be able to refund. If you purchased Sense from a third party, you will be covered by their individual return policy.

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 8:14:20 PM

Modified By: HEIDER

Size: 370 KB

¶1: Startup Failure Post-Mortems 2014 First Update (6/3/2014)

¶2: Inq Mobile

¶3: Title: Inq Mobile Shuts Down
¶4: Title Link: https://techcrunch.com/2014/01/30/inq-mobile/
¶5: Company: Inq Mobile
¶6: Company Link: https://www.cbinsights.com/company/inq-moblie

¶7: Inq has been a really exciting business over the last few years and whilst there have been significant successes, the technology that's been borne out of that work has been identified to have greater application within the wider Group. Consequently, we've taken the hard decision to close the Inq business down.

¶8: Inq Moblie

¶9: CONSUMER PRODUCTS & SERVICES | Consumer Electronics
¶10: inqmobile.com

¶11: Founded Year

¶12: 1999

¶13: Stage

¶14: Dead | Dead

¶15: About Inq Moblie

¶16: Inq Moblie is a smartphone-maker, creating a range of devices that included two 'Facebook phones' in 2011.

¶17: Inq Moblie Headquarter Location

¶18: 30501 Agoura Road Suite 203
¶19: Agoura Hills, California, 91301,
¶20: United States
¶21:

¶22:

¶23:

¶24: Inq Mobile, One Of The First Facebook Phone Makers, Shuts Down

¶25: **Catherine Shu**@catherineshu / 7:18 AM GMT+1•January 31, 2014

¶26: Title Link: https://techcrunch.com/2014/01/30/inq-mobile/

¶27:

¶28: Inq Mobile, one of the first companies to build a Facebook phone, announced that it has shut down with a message on its site (h/t Android Police). In a statement, the U.K.-based, Hutchison Whampoa-backed company said:

¶29: “Inq has been a really exciting business over the last few years and whilst there have been significant successes, the technology that’s been borne out of that work has

been identified to have greater application within the wider Hutchison group. Consequently, we've taken the hard decision to close the Inq business down.

¶30: We want to thank all the customers and employees that have engaged with Inq's products and experiences over the years.

¶31: Inq's software services Material and SO.HO will be closed down at the end of January. For more information please go to www.inqmobile.com."
¶32:

¶33: Inq, which was founded in 2008 and pivoted a year ago to focus on mobile software, said it will no longer update Material and SO.HO, its apps. Material, a news reader, released its final editions on Jan. 28, while social media aggregator SO.HO will not be updated after today, though it will continue to function. Support pages for the Cloud Touch smartphone and Inq's featurephones remain on its site.

¶34: The timing of Inq's closure and Material's shutdown is interesting because several of tech's largest companies have recently started to offer their own news apps and tools. These include Yahoo's News Digest; Twitter and CNN's Dataminr; and Paper by Facebook, which will launch next month.

¶35: Inq Mobile began as a maker of low-priced Android smartphones. It was one of the first companies that collaborated with Facebook to create a social smartphone in 2011, around the same time HTC and the social network struck the partnership that yielded the Salsa and ChaCha.

¶36: Inq's Cloud Touch, which was released exclusively in the UK three years ago, had a custom Facebook wrapper built on top of Android, and an early version of SwiftKey. Though cheaply priced (starting at $50 with a subsidized contract), the Cloud Touch couldn't compete with Samsung's rapid takeover of the Android market. The company pivoted and started developing mobile apps one year ago.

¶37: Material, which TechCrunch covered when it launched its iOS version in August, was a social magazine app that used Inq's "interest extraction engine" to look at the Facebook and Twitter accounts of users and figure out what kind of articles they wanted to see. Content was delivered in two daily editions.

¶38: At its launch, Material already had strong competition from popular social news readers like Flipboard, Zite, and Pulse.

¶39: Inq CEO and co-founder Ken Johnstone told TechCrunch at the time that Material differentiated from other news readers by offering an easier set-up than its rivals because all users needed to do to power Material's algorithms was connect their Facebook or Twitter accounts.

¶40: "For somebody who has invested a lot of time in Twitter and Facebook anyway, this is about getting a return on that investment," Johnstone told TechCrunch's Natasha Lomas.

¶41: Yahoo, Twitter, and Facebook's news aggregation products all feature some human curation, but, like Material, they also rely heavily on algorithms to customize content for each user. Inq had planned to monetize Material by harvesting enough data to build an advertising business, but its failure to do may be a cautionary tale for other developers of news readers, even as they continue to rethink how content is organized.

¶42: Though algorithms are necessary if a news aggregator wants to scale up (and collect enough data to be profitable), they still can't replace the discernment of a human editor. Like Feedly, Pulse, and Zite, Material's customized content stream suffered from problems like miscategorized stories, irrelevant content, and "the overall feeling you get from flicking through an edition is not a cohesive, editorially unified whole, but an algorithmically generated bunch of mostly random stories with (at best) a few loose, overlapping themes," as Natasha put it.

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Created On: 05-Jan-22 9:29:50 PM

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Modified On: 08-Dec-21 7:37:01 PM

Modified By: HEIDER

Size: 8 KB

¶1: Startup Failure Post-Mortems 2017 Third Update (10/31/17)

¶2: Jawbone

¶3: Title: Jawbone to Be Liquidated as Rahman Moves to Health Startup

¶4: Title Link: https://www.theinformation.com/articles/jawbone-to-be-liquidated-as-rahman-moves-to-health-startup

¶5: Product: Jawbone

¶6: Product Link: https://www.cbinsights.com/company/jawbone

¶7: *The Information* broke the news of Jawbone's demise based on insights from a source close to the company.

¶8: Jawbone co-founder and CEO Hosain Rahman has founded a new company called Jawbone Health Hub that will make health-related hardware and software services, according to the person. Many employees of Jawbone moved to the new firm earlier this year, the person said. Jawbone Health will service Jawbone's devices going forward, said the person.

¶9: A notice sent to creditors said Jawbone entered into insolvency proceedings under California law on June 19. A company has been set up to liquidate Jawbone's

assets. Jawbone hired Sherwood Partners to handle the matter. The notice says creditors have 180 days to file a claim.

¶10: Jawbone

¶11: CONSUMER PRODUCTS & SERVICES | Consumer Electronics

¶12: jawbone.com

¶13: Founded Year

¶14: 1999

¶15: Stage

¶16: Dead | Dead

¶17: Total Raised

¶18: $929.9M

¶19: Revenue

¶20: $0000

¶21: About Jawbone

¶22: Jawbone, formerly Aliph, develops products and services for mobile devices such as headsets and wireless speakers. The company is the creator of JAMBOX and BIG JAMBOX wireless speakers, the Jawbone ERA and ICONTM Bluetooth headsets, and NoiseAssassin technology.

¶23: Jawbone Headquarter Location

¶24: 99 Rhode Island Street 3rd Floor
¶25: San Francisco, California, 94103,
¶26: United States
¶27: 800-529-2663
¶28:

¶29: Jawbone to Be Liquidated as Rahman Moves to Health Startup

¶30: By Reed Albergotti | July 6, 2017 1:45 PM PDT

¶31:
https://www.theinformation.com/articles/jawbone-to-be-liquidated-as-rahman-moves-to-health-startup

¶32: Jawbone, the consumer electronics firm once valued at $3 billion, is going out of business. The company has begun liquidation proceedings, after years of financial pressures, according to a person close to Jawbone.

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¶34:
¶35:
¶36:
¶37: MMMMM
¶38:
¶39:
¶40:
¶41:
¶42: Failed Startups: Jawbone
¶43: Mary Juetten
¶44: Mary JuettenFormer Contributor, Feb 5, 2019,08:45am EST|8,992 views
¶45: at:
https://www.forbes.com/sites/maryjuetten/2019/02/05/failed-startups-jawbone/?sh=2caa46675b6d
¶46:
¶47: Long is the list of Silicon Valley startups that have begun their lives as the next big thing, their ideas as the wave of the future, only to have that ingenuity fail to meet any actual success. Translating ideas into reality is hard, the process of manufacturing technological devices harder still, and gauging what the public wants and capturing a share of the available market can seem nearly impossible to those in the midst of trying to accomplish just that. Hitting that particular mark and achieving every objective that you need for early, sustained success can be akin to a magic trick.
¶48:
¶49:
¶50: Jawbone was, or is, a company with an interesting journey through the startup landscape as it tried to accomplish this trick. The company entered the public sphere as a maker of wireless technology, selling Bluetooth headsets and wireless speakers under the stewardship of CEO Hosain Rahman. It was a curious case among startups, an unusually long-gestating but soon-to-be-successful unicorn, its birth and rise chronicled by Fortune in 2015 in a familiar hagiography that accompanies many an entrepreneur on their way up.
¶51:
¶52: This particular celebration of the company was on the occasion of the launch of its newest product, the UP3 fitness tracker band. The UP3 represented an expansion of the company's ambition, as Jawbone seemed to be on solid footing; the company was raising money at a $3 billion valuation from some of the biggest venture capital firms in Silicon Valley.
¶53:

¶54: As we've seen throughout recent years (and throughout this series), appearances can be deceiving when it comes to startups. The same Fortune profile lauding the company's rise notes that Jawbone "continues to scramble for cash and struggles to ship a quality product on time." And the company's investment into the UP3 proved to be a poor bet; iterations of the product encountered various problems, and users often ran up against the limitations of the device as well as its high price. It also faced stiff competition from Fitbit, who was by then offering similar products at a lesser price, and Apple, who offered some of the same tracking measures in the Apple Watch, in addition to being the globe-bestriding technological colossus that can destroy the fortunes of an ambitious startup with their latest product launch.

¶55:

¶56: The reality of Jawbone's decline began to appear in 2016, as the company stopped making and then selling their fitness trackers before eventually selling off their remaining inventory to a reseller. Soon thereafter, Jawbone discontinued its relationship with its outside customer service agency after they were unable to pay for their services, according to Business Insider, failing to replace it with customer service of any kind and angering its remaining customers in the process. Additional reporting from the website states that Jawbone was looking to shift to wearables to measure health information, but was unable to get the devices to work properly.

¶57:

¶58: And while likely not a contributing factor to the company's ultimate decline, Jawbone's fortunes were further complicated by a lawsuit against Fitbit, accusing their competitor of pilfering both employees and trade secrets from Jawbone. While the matter was initially decided in favor of Fitbit, the issue was revived when federal prosecutors indicted current and former Fitbit employees for possession of stolen trade secrets.

¶59:

¶60: Jawbone's end is unlike that of others that have reached the end of their financial runway. In reporting on the company's liquidation, The Verge notes that Rahman has already begun work on Jawbone Health Hub (since renamed Jawbone Health) to provide "health-related products and services" and service existing Jawbone devices, and brought many former Jawbone employees with him. While little can be gleaned about the new venture from its website, in a wide-ranging interview with Recode's Kara Swisher, Rahman touches on the mistakes and failures of his previous venture.

¶61:

¶62: Startups of any kind are a challenge, and startups wherein hardware is involved are particularly challenging. And yet for all of the risks, there were no glaringly unwise mistakes on the road to failure that can be seen in many of the other stories of startups that failed. It took sixteen years before the missteps of the UP3, and while the company was never making money, it produced quality products that furthered its growth and valuation and fueled investor confidence. Rather, it seems that a big bet on a product that didn't work as intended, couldn't be fixed as easily as software, and faced strong competition was too great a gamble for a startup with too little margin for mistakes.

¶63:

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Modified On: 02-Jul-21 8:14:20 PM

Modified By: HEIDER

Size: 688 KB

¶1: Startup Failure Post-Mortems 2016 First Update (2/15/2016)

¶2: Kolos

¶3: Title: 10 Lessons I Learned From Burning Through $50,000 on a Hardware Project That Bombed
¶4: Title Link: https://tech.eu/features/4346/kolos-kickstarter-story/

¶5: Product: Kolos

¶6: With Kolos, we did a lot of things right, but it was useless because we ignored the single most important aspect every startup should focus on first: the right product.

¶7: Kolossal failure: 10 lessons I learned from burning through $50,000 on a hardware project that bombed

¶8: By Ivaylo Kalburdzhiev
¶9: April 16th, 2015.

¶10: Title Link: https://tech.eu/features/4346/kolos-kickstarter-story/

¶11: This is how you probably don't want to see your startup trajectory as a first-time entrepreneur:

1. ¶12: Come up with an idea
2. ¶13: Go to your bank and get a loan
3. ¶14: Build the idea in isolation
4. ¶15: Launch a Kickstarter campaign
5. ¶16: See it fail after three years in development

¶17:

¶18: Well, that's exactly what happened to me.

¶19: Hopefully, sharing my experience will help you avoid falling down a similar path.

¶20: The story

¶21: It was the end of 2011, tablets were just gaining traction. One day, I stumbled upon this:

¶22:

¶23: After seeing the image, I thought: “That’s interesting. Why not combine the already established gaming wheels concept with an iPad, the most popular tablet out there?”

¶24: Boy, didn’t I feel like a genius.

¶25: After a couple of months of research, I didn't find anything similar and so I diligently made the decision that would shape the next three years of my life: to build KOLOS, “the world’s first” racing wheel for full-sized iPads.

¶26: Thrilled, I went straight to my bank and signed off papers for a $30,000 loan. Without bothering to make a DIY mockup first, I instantly contracted an industrial designer to create the CAD models. Then, I ordered a couple of 3D printed prototypes and filmed them for a fancy video.

¶27: By then, more than a third of the money had disappeared just like that.

¶28: Go Indiegogo

¶29: Fast forward a few months, I launched it on Indiegogo (which was considered this new "crowdfunding" concept back then) to test the demand. We got featured here and there and a few lost souls chipped in $115 for a potential piece of plastic. Needless to say, the campaign didn’t reach its $150,000 goal, so I decided there was something wrong and I needed to fix it. This was already a year in and I still hadn’t talked to any potential customers.

¶30: After numerous rejections from accelerators and investors, I started going to conferences in order to build my network, pitch the idea and get actual feedback (finally). Many early-adopters liked it.

¶31: But, did they have an iPad? Did they really believe there were real problems to be solved? Or was it just something fun and “nice-to-have”? And did I ever bother to ask them all that? Nope.

¶32: In the summer of 2014, the team went through an accelerator receiving another $20,000 (bringing the total amount to $50,000) and visited the international CES event shortly after. Mostly, we kept hearing things like, “I’d like to get it for my son/nephew/cousin,” instead of, “That’s super awesome, I want it now!!11!” and then throwing money in our faces. Distributors liked it, but what do they know? They just want to make a buck out of it anyways, so they weren’t a real indicator.

¶33:

¶34: A few months later, a Kickstarter campaign followed – this had been after a total of three years of product development. Eventually, I cancelled it after embarrassing – yet also sometime constructive – comments and getting picked up by major publications, such as Cult of Mac, VentureBeat, and Yahoo! Games among others.

¶35: *(Editor's note: in fact, I enthusiastically backed the KOLOS campaign)*

¶36:

¶37: Lessons learned

¶38: Here are some of the lessons I've learned from the roller-coaster journey:

¶39: **1) Scratch your own itch**

¶40: When I first came up with the idea, I didn't own a tablet, nor was I actively playing racing games on any platform. Guess what the very first thing I did with the money was? I actually bought an iPad and installed a few tilt games. I was never solving a problem I had myself, which naturally involved a huge chance of building the wrong product.

¶41: Whatever you start working on, make sure it's a pain you've had yourself, so you can really relate to it.

¶42: **2) Make sure there's competition**

¶43: My initial research didn't show any similar accessories to the idea I had at the time.

¶44: The questions I should have asked and, more importantly, answered, are: Am I really the first one to come up with this idea? Or is it just something nobody needs? If it's really an awesome idea, why isn't someone else already doing it? Competition usually means there's a market for it in the first place. I obviously thought I was going to create a new category. *Yeah, right.*

¶45: **3) Build an MVP**

¶46: Before I ever spent a penny on anything, I should have first put together a similar minimum viable product (MVP) and went to talk to people at an Apple Store for feedback. It would have saved me a lot of agony if I had realized early on that there weren't any real problems to be solved. The iPad is a portable lightweight device, which doesn't really need an extra bulky accessory to make the experience more comfortable and precise – or to be stuck to a table only.

¶47: **4) Talk to customers**

¶48: In order to justify the product to myself, I started making problems up – there's an extra iPad tilt, tired arms, uncomfortable grip, etc. Joining the accelerator, we were reminded of how important talking to customers actually is. So I "cleverly" put up an online survey and started sending it out to all our subscribers, with biased questions like, "You have these problems, right?" What I should have done is actually gone out of my comfort zone and talked to them one-on-one about their lives, experiences and pains. Instead, I continued to perfectly execute the wrong plan.

¶49: **5) Don't ignore the product**

¶50: With KOLOS, we did a lot of things right, but it was useless because we ignored the single most important aspect every startup should focus on first: the right product. I consider it the classic mistake for first-time entrepreneurs. If you're just starting out on an idea, I would recommend reading and implementing The Lean Startup by Eric Ries. There are also two free courses that could possibly save you years of mistakes, time and money – I wish I would have taken them before I started.

¶51: **6) Avoid tackling too narrow of a niche**

¶52: Along the way, I've heard the same thing over and over again, "Why just the iPad, why not all tablets?"

¶53: Looking back, if I would have properly validated the concept, I would have approached a broader market. For example, an adjustable accessory – not necessarily a wheel – that could fit all available gaming tablets out there. Although some recommend dominating a niche first, I think the chosen one, which was full-sized iPad racers only, was too narrow to start with.

¶54: **7) Take a good look at the market and its potential**

¶55: Another risk I took was diving into a new category so quickly – the iPad is now being cannibalised by iPhones and MacBooks and its sales are forecasted to drop rapidly. Overall tablet sales are also projected to continue at a slow pace in 2015. As one of the world's most renowned VCs, Marc Andreessen once wrote, market is "the only thing that matters".

¶56: **8) Spend your funding carefully**

¶57: I used the money to pay for 3D models, expensive prototypes, a trademark, design patent and huge attorney fees. Then, I used more of the money for a fancy video, to write a business plan, to fix my car, for a new phone, for a four-figure marketing strategy and more. My financial 'planning' was so destructive because I thought the money would never end. I used it in a million meaningless ways, just before I realized I was going broke. What I learned: You don't need any of the things mentioned above until you're sure that you're building something that people actually want.

¶58: **9) Don't be naïve**

¶59: Product Hunt founder Ryan Hoover wrote something gold: "When you look back at yourself six months from today and don't feel embarrassed by your naiveté, there's a problem. That means you're not learning, growing." At the time, I really believed there was a chance we were doing something that would sell. And I couldn't have been more wrong.

¶60: When I personally emailed every single subscriber saying, "Still interested? Here is it!" and linking to the Kickstarter, out the hundreds of opens, I only received five responses with two of them ending up pledging. So: Always be brutally honest with yourself about what you are building and why it matters.

¶61: **10) Fail fast**

¶62: In 2014, I got fired from my day job and two of the team members from KOLOS left. I thought it would be the perfect time to rebuild the team and fully dedicate to the project, which I ended up both doing.

¶63: However, if you haven't made any significant progress after two years, something is probably dead wrong. The Kickstarter campaign was way overdue, especially since it was launched after three years of development, and the whole project simply took way too long. If it takes you more than a year to develop a physical product (read: prototype and test/get feedback on) and launch a crowdfunding campaign, you're probably going too slow.

¶64: Conclusion

¶65: I like to look at my experience as if I went through an affordable MBA. Stanford and Harvard both welcome you at about $100,000 per year, and I doubt I would have learned so much more there – even I if could afford it. I don't believe you need to go through any of that to be a successful entrepreneur though. Buffer co-founder Joel Gascoigne didn't go through an expensive MBA program. Instead, through a side project, he identified and – more importantly – tested-before-he-built a solution to a problem he had with social media-sharing. In a blog post, Joel recommends a list of 50 books that have transformed his personal and business life. Read just half of them and I'm sure you'll be good to go.

¶66: Here's how a few other big-name companies validated their ideas without much effort or resources before building: Andrew Mason of Groupon initially sold only T-shirts in one size and colour in a simple WordPress blog to test the concept. Nick Swinmurn of Zappos took pictures of shoes and uploaded them online to see if people were actually ready to buy shoes online – it was 1999. Drew Houston of Dropbox put together a short demo of how the product was meant to work, testing his assumption of people wanting a seamlessly working file-sync tool.

¶67: From my modest experience, I've learned that just because you're building something, doesn't make it worthwhile for customers. Think of that last useless app or product you saw recently. Did it ever cross your mind that you might be creating something similar?

¶68: Perhaps, just like them, you decided it would be a great idea if you just built it? Unless you are scratching a very itchy itch you're having yourself – and at least a few other people have – I suggest you stop the guessing game and get out of the isolation of your own home or office and start talking to customers in order to make something they'd truly want and pay for.

¶69: *Images courtesy of Ivaylo Kalburdzhiev.*

¶70:

¶71:

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 11:02:05 PM

Modified By: HEIDER

Size: 62 KB

¶1: Startup Failure Post-Mortems 2017 First Update (2/10/17)

¶2:

¶3: Lily Robotics

¶4: ~~Title: The Adventure Comes to an End~~ **~~(NOT WORKING)~~**

¶5: Title*: The autonomous Lily drone is dead and buyers are being offered refunds
¶6: Title* Link:
https://www.theverge.com/2017/1/12/14248988/lily-drone-tracking-dead-refunds

¶7: Product: Lily Robotics

¶8: Product Link: https://www.cbinsights.com/company/lily

¶9: In the past year, the Lily family has had many ups and downs. We have been delighted by the steady advancements in the quality of our product and have received great feedback from our Beta program. At the same time, we have been racing against a clock of ever-diminishing funds. Over the past few months, we have tried to secure financing in order to unlock our manufacturing line and ship our first units – but have been unable to do this. As a result, we are deeply saddened to say that we are planning to wind down the company and offer refunds to customers …

¶10: Lily Robotics

¶11: CONSUMER PRODUCTS & SERVICES | Consumer Electronics

¶12: lily.camera

¶13: Stage

¶14: Dead | Dead

¶15: Total Raised

¶16: $15M

¶17: About Lily Robotics

¶18: Lily, founded in 2013, is a technology company that makes flying cameras. The company's flagship product, the Lily Camera, is the first autonomous, throw-and-shoot imaging device in the world. It is a camera on a small quadcopter that autonomously follows owners and shoots pictures and videos.The company had also raised $34 million for pre-orders in January 2016 on its website and not via Kickstarter or Indiegogo.

¶19: Lily Robotics Headquarter Location

¶20: 216 Park Lane

¶21: Atherton, California, 94027,

¶22: United States

¶23:

¶24: The autonomous Lily drone is dead and buyers are being offered refunds

¶25: By James Vincent Jan 12, 2017, 4:29am EST

¶26: Title* Link:
https://www.theverge.com/2017/1/12/14248988/lily-drone-tracking-dead-refunds

¶27:

¶28: Photo by Amelia Holowaty Krales / The Verge

¶29: Another ambitious crowd-funded drone has died — this time, the autonomous Lily camera drone. After collecting more than $34 million in pre-orders from 60,000 customers, the company behind Lily has closed after failing to secure financing for full-scale production.

¶30: In a blog post titled "The Adventure Comes to an End," Lily founders Antoine Balaresque and Henry Bradlow said they would be offering refunds to all customers, and that they were "sorry and disappointed" about the company's demise.

¶31: "We have been racing against a clock of ever-diminishing funds," write the pair. "Over the past few months, we have tried to secure financing in order to unlock our manufacturing line and ship our first units — but have been unable to do this. As a result, we are deeply saddened to say that we are planning to wind down the company and offer refunds to customers."

¶32: Customers should receive refunds over the next 60 days, though if the card used to preorder the drone is now expired, they'll need to fill out a form.

¶33: The news will be a blow to backers enthused by the Lily's promise. Early promo footage of the drone offered a persuasive case of how smart sensing technology could turn quadcopters into powerful photography devices. Activating the drone was as simple as throwing it into the air, and the Lily could automatically follow users with a tracking puck, shooting pictures and video along the way. The drone was supposed to be waterproof and offer battery life of up to 20 minutes, with a pre-order price of $499.

¶34: But as we've seen in the past with failed drone projects like the Zano (Europe's biggest Kickstarter failure), the step from prototypes to full-scale manufacturing is a difficult one. And in an industry where margins are tight and even well-established firms like Parrot are downsizing, the Lily's failure is a disappointment rather than a surprise.

¶35:

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 08-Dec-21 7:41:48 PM

Modified By: HEIDER

Size: 5 KB

¶1: Startup Failure Post-Mortems 2018 Third Update (11/14/2018)

¶2: Liquavista
¶3:

¶4: Title: Amazon has shut down Liquavista
¶5: Title Link:
https://the-digital-reader.com/2018/10/15/exclusive-amazon-has-shut-down-liquavista/

¶6: Product: Liquavista
¶7: Product Link: https://www.cbinsights.com/company/liquavista

¶8: The Digital Reader confirmed the screen tech company's shutdown in an article:

¶9: An Amazon rep told me this morning that they 'can confirm that Liquivista is no longer operating.' However, they were unable to tell me whether Amazon still be pursuing this tech, if Liquavista's R&D work been shifted to another unit, or the state of their screen production.

¶10: Liquavista
¶11: ELECTRONICS | Electronic Components / Lighting & LED

¶12: liquavista.com

¶13: Founded Year
¶14: 2006

¶15: # Stage

¶16: Dead | Dead

¶17: # Total Raised

¶18: $35.6M

¶19: # About Liquavista

¶20: Liquavista, a spin-out from Dutch electronics Philips, developed and patented an electro-wetting technology for use in electronic display screens. Its unique IP allowed it to create full colour, 'paper-like' displays, capable of displaying video, while consuming less than one third the power of a traditional LCD. Liquavista's technology could address all the display markets currently dominated by LCDs, including mobile and fixed applications.

¶21: # Liquavista Headquarter Location

¶22: 400, Kastanjelaan

¶23: Eindhoven, 5616 LZ,

¶24: Netherlands

¶25:

¶26:

¶27:

¶28:

¶29: Cause of Failure

¶30: https://www.failory.com/amazon/liquavista

¶31: Despite the promising acquisition, in 2013 Amazon representatives revealed that Liquavista was no longer operational. The R&D work for Liquavista was shifted to other units.

¶32:

¶33: The motivation behind founding Liquavista was to solve the issue of low battery life that devices faced. Back in the day, it was a huge problem for smartphone makers and this is why Samsung had been eager to buy the company. However, when Amazon acquired it, the issues associated with mobile battery life had largely been solved as battery lives were improving each year and screens were getting more energy efficient. This reduced the market need for Liquavista’s technology that never really materialized.

¶34:

¶35:

7 reasons why my IoT startup failed

yourstory.com/2015/06/iot-startup-fail/amp

June 24, 2015

Expert Opinion

By Yash Kotak
June 24, 2015

After five months of toiling 14-hour days, making a hardware IoT (Internet of Things) product from scratch and spending lakhs of rupees of investor money, it suddenly dawned to me and my two founders that our product won't sell.

We had to do something about it or the startup was doomed. The month was December 2014.

Being first-time entrepreneurs, we made tons of mistakes. I'll mention the top seven mistakes we made that led to our failure. But first the story to give you some background!

Image credit: Shutterstock

July 2014

Our vision was to make super-smart internet connected switches that learn from user behaviour and personalize electronic appliances in a home to its owner. We named the product Lumos (Yes, I am a big Harry Potter Fan!)

We headed off to our alma mater, IIT-Gandhinagar, to get incubated after taking some pre-seed money from an angel investor. We converted a lab into our office space and the Lumos saga started!

We built like crazy. Being engineers, provided with an interesting problem to solve, we forgot everything else and just built. Our first prototype, which automated lights, was ready in 45 days.

The second prototype, which could automate lights, fans, ACs and water heaters was out in another month. Pretty fast for a 2-person team, building hardware and software at the same time!

November 2014

We got one more co-founder on board to help us out with machine learning. In mid-November, we started moving from the ugly-but-functional prototype stage to the beautiful product stage. In December, we were already in talks with investors to raise the next round of funding.

We were on track to have a hardware product on the market in less than one year. We were pleased with ourselves. The investors were pleased with us. Life was good.

December 2014

Until it was not. We had underestimated the work, time and funding that goes into making a market-ready hardware product. We had overestimated the demand and utility of our product.

“Hardware products sell at 4 to 5 times the component costs. How did we not know this?”

Our price estimates were wildly off the mark. And when all this realization came together, we were in a crisis.

January 2015-April 2015

We were forced into making major pivots.. We had to go back to the drawing board and think about what we should work on.

Not knowing what you will work on might just be second to running out of money, in the list of worst things that can happen in a startup.

We made bigger mistakes. We left IoT as a sector. One of our co-founders decided to call it a day and take up a job.

Now that you have some background, here are the top seven mistakes we made in Lumos and what we learnt from them.

Mistake 1: We were neither experts nor target users of the product that we were building

We had never used the existing home automation products in our homes. We were not veterans in the IoT sector. When you are inexperienced at something, you give yourself the famous Dunning-Kruger pass on your decisions.

Had we been users of existing smart switches, we would have known that the incremental value that our product was offering was quite low. Had we been experts in IoT, we would have known how to price hardware, and the difficulties in building it.

By avoiding this mistake, you can avoid a lot of other mistakes which happen as a result of this one.

Learning: *Work on something where you are either an expert or a top user. If not, become an expert/top user.*

Homejoy Founder Adora Cheung herself worked as a professional cleaner to understand the business.

Mistake 2: We did not do the due diligence on the idea before we started building the product

We did not understand the market and competition well enough. We also did not figure out the persona of our customer, and whether the customer was looking for the value that we were providing.

It is always possible to validate or invalidate a lot of assumptions about the product, market and competition without building the full-fledged product.

One way we could have done it was by selling existing products to our potential customers.

Learning: *I learnt this very useful method in an accelerator. Make a thorough list of hinge-breaking assumptions for your market, product and competition. Hinge breaking assumptions are those that can make or break your company.*

Rank them according to probability of the assumption being wrong and subsequent risk to company. Start validating from the top while building as less as possible.

Mistake 3: We thought that we were smarter than everyone else

I have seen this in dozens of entrepreneurs I met in the past year. I think it comes as a part of the entrepreneurial mindset; which makes cash-strapped entrepreneurs take on billion dollar companies and beat them at their game.

But it can also be a lethal trap; as it was in our case. We knew that companies like Belkin sold internet-connected switches at $50. How can they be so stupid? Don't they understand that selling switches at a lower cost will give them better volumes? We will sell smarter switches at half the price. (Yeah, right!)

Nest's machine learning algorithm is not perfect. But ours will be. You get the idea.

Learning: *You will have to be smarter than your competitors to beat them. But you should be able to quantify why. You should have a logical answer to the famous YC question: "What do you understand about your business that other companies in it just don't get?"*

Answers like "Machine Learning" and "Better Design" usually don't make the cut. You have to understand that your established competitors have more resources and more hiring power (Andrew Ng works with Google!). To beat them, you should be doing something fundamentally different.

Mistake 4: The ROI for our product did not make sense

The incremental value that Lumos switches provided did not justify the cost that the target customer had to pay for it.

Learning: *The value-pain equation for your product should make sense for your target customer. Unless value>pain, your product will not sell.*

The product will not sell because it is cool; or because the market is projected to be worth $19 trillion in the next 5 years. It will only sell if customers get significant value out of the product.

Mistake 5: We let sunk cost bias affect our decisions about pivoting

It was not that we were clueless about the problems in our product. We had doubts in our minds. In a startup, you almost always have doubts. But we had built so much. We were in love with our product. And we were not ready to ask the difficult questions.

Is it okay to be doubtful about your product? Is it okay to voice your doubts and bring the team morale down?

Or make your co-founders feel that you are not as committed to the idea and the vision as they are?

"It helps to be transparent about your doubts with co-founders in the long run."

It would have saved us a couple of months and some money.

Learning: *It is absolutely necessary for founders to be committed to the vision of the company. However, there are multiple ways to achieve a vision. Don't fall in love with it one way. Accept the possibility that you might have to start things over from scratch.*

Build a culture of transparency in your company. Encourage dissent among co-founders and deal with it objectively.

Mistake 6: We were trying to do everything for everybody

We were making switches that could automate your lights, fans, ACs and water heaters. We would have tried to automate your TV, Fridge, Oven and Car as well had it been feasible to do so.

We were pitching power savings as well as luxury. This made the product and the pitch very complicated.

Learning: *As a startup, you are constrained by your resources. So it is always better to identify and solve one problem very well instead of solving n problems in a so-so way.*

Nest solved the heating problem. Dropcam and Canary solved the security problem. Try to be a drug for your customer instead of being a vitamin.

Mistake 7: We underestimated hardware

Building a successful startup is hard. Building a hardware startup is 10 times harder.

Pebble, with all its Kickstarter success, is still in troubled waters.

Building a prototype is the easiest part of building a hardware startup. The real challenge comes in product design, production engineering, manufacturing, distribution and marketing/sales. And you need to have friends in China.

Also, hardware product validation and iteration cycles are much longer than software ones. Getting funding is relatively difficult; VCs ask for traction (~$1M on Kickstarter/Indiegogo, last I heard) because of the inherent risk in a hardware startup.

Managing cash flows is hard because you have to pay your vendors months before you get paid from your customers.(source)

Considering all this, we were not the right team to build a hardware company.

Learning: *Understand what you are getting into if you are starting a hardware company and plan accordingly. Get experienced people on your team or get into a hardware accelerator like HAXLR8R.*

Today

Eventually, we ended up leaving hardware and IoT and decided to build something that solves a problem that we had experienced. Since Gandhinagar (where Lumos was located) does not have many startups, interacting and sharing experiences with other entrepreneurs was always a big problem for us. Also, we had to subscribe to a lot of blogs (crowded inbox) just to stay updated with top content on Entrepreneurship.

We decided to build FundaMine to solve this problem.

FundaMine is a community for professionals to discover what experts in their profession are reading and discussing. FundaMine has communities (mines) on Entrepreneurship, Product Management, Android Development and IoT. Do check it out and wish us luck!

Created On: 05-Jan-22 9:29:50 PM

Created By: HEIDER

Modified On: 02-Jul-21 8:14:20 PM

Modified By: HEIDER

Size: 396 KB

¶1: Startup Failure Post-Mortems 2015 First Update (8/15/2015)

¶2: Lumos

¶3: Title: Five Reasons Why My IoT Startup Failed
¶4: Title Link: https://medium.com/startup-lesson-learned/5-reasons-why-my-iot-startup-failed-19c5537e61e1

¶5: Product: Lumos

¶6: Product Link: https://www.cbinsights.com/company/lumos-design-technology

¶7: We had never used the existing home automation products in our homes. We were not experts in the IoT sector. When you have new at something, you give yourself the famous Dunning Kruger Pass on your decisions.

¶8: Lumos Design Technology

¶9: ELECTRONICS | Electrical Product Distribution / Power Generation & Storage
¶10: iwearlumos.com

¶11: Founded Year

¶12: 2012

¶13: Stage

¶14: Dead | Dead

¶15: Total Raised

¶16: $410K

¶17: About Lumos Design Technology

¶18: Lumos has developed a technology that can turn backpacks or briefcases to a mobile charger. The solar backpack can house a laptop and other gadgets, and uses an innovative solar fabric to charge devices. The backpack has an in-built battery that can store the solar energy and can charge smartphones and other USB-based devices like MP3 players, Bluetooth headsets, etc. The backpack comes with a wide range of mobile phone connectors for different models.

¶19: Lumos Design Technology Headquarter Location

¶20: CA Site No:1. JSS Institution Campus HAL 3rd Stage, Behind Hotel Leela Palace, Kodihalli

¶21: 560 008,

¶22: India

¶23: +91-99801-61617

¶24:

¶25: Lessons From My IoT Startup

¶26: Yash Kotak Jun 8, 2015

¶27: Title Link: https://medium.com/startup-lesson-learned/5-reasons-why-my-iot-startup-failed-19c5537e61e1

¶28: After 5 months of toiling 14-hour days, making a hardware IoT product from scratch and spending thousands of dollars of Other People's Money, I and my two co-founders woke up with a jolt. It suddenly dawned to us that our product would not sell. And unless we did something about it, the startup was doomed. This was December 2014.

¶29: Dreamy eyed noobs that we were, we made tons of mistakes. I hope this post helps you avoid some of those mistakes because as much as we glorify failure in the startup world, it does hurt. A lot.

¶30: Let me back-track a few months to give you some background. We started working on Lumos in July 2014. We were building smart internet connected switches that learn from user behavior and automate all the electronic appliances in a home. We took some pre-seed investment from an angel investor and headed off to our alma mater IIT Gandhinagar to get incubated.

¶31:

¶32: The Lumos Team at work!

¶33: We built like crazy. That's the thing about us engineers; if you give us something interesting to build, we will forget everything else and just build. Our first prototype, which automated lights, was ready in 45 days. The second prototype, which could

automate lights, fans, ACs and water heaters was out in another month. This is a really impressive speed for a hardware product.

¶34: 

¶35: The first PCB built by Lumos!

¶36: In mid-November, we got a product designer on board to design the final product. In December, we were already in talks with investors to raise the next round of funding. We were on track to have a market-ready hardware product in less than one year. We were pleased with ourselves. The investors were pleased with us. Life was a bed of roses.

¶37: Until it was not. We had underestimated the work that goes into making a market-ready hardware product. We had overestimated the demand and utility of our product. We were wildly wrong about the price at which we thought our product would sell. And when all this realization came together, shit got real.

¶38: We were forced into a deathly spiral of pivots that almost killed the company. We made bigger mistakes. We left IoT as a sector. We lost a cofounder on the way. The pivots are a long story. I'll save it for another day.

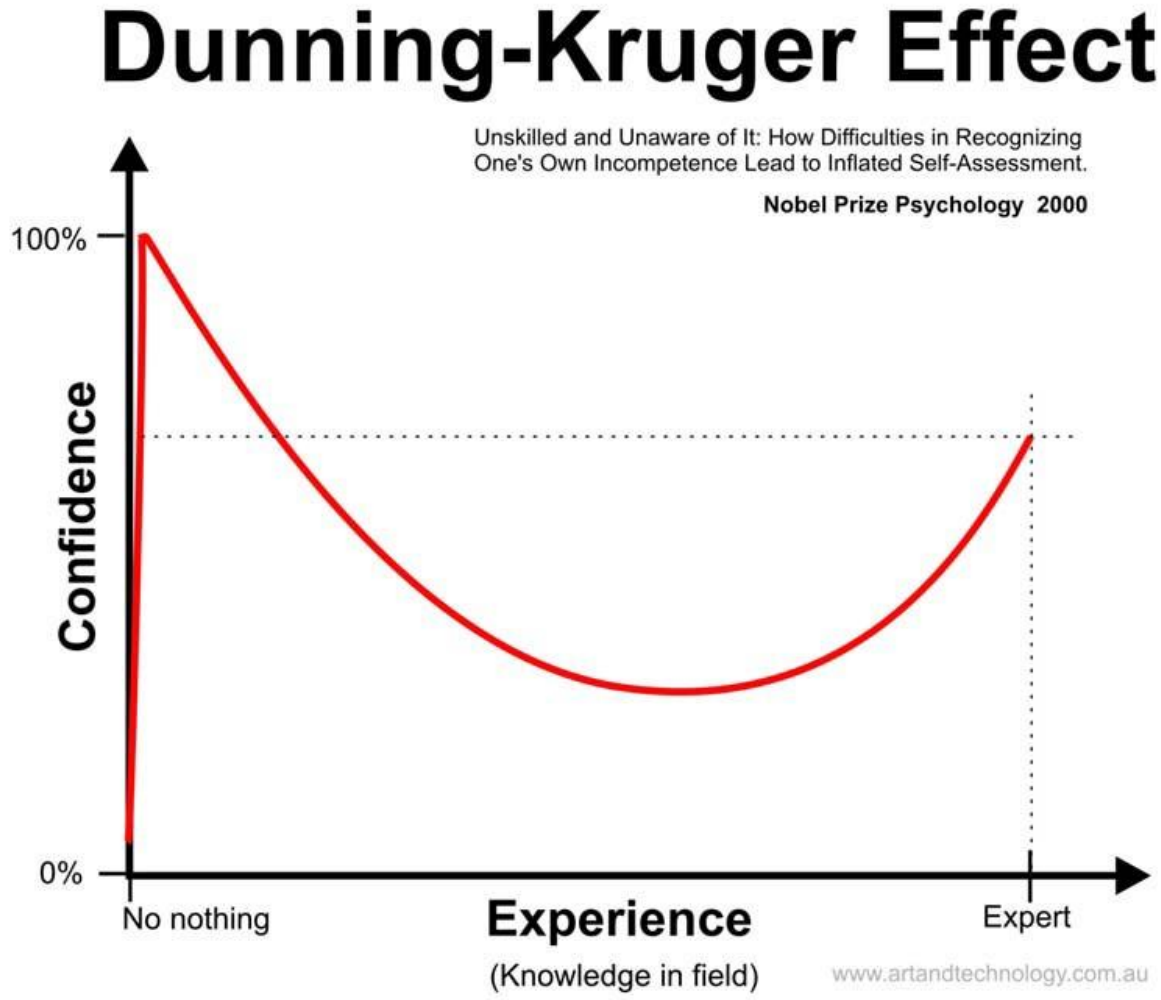
¶39: Now that you have some background, here are the top 5 mistakes we made in Lumos and what we learnt from them.

¶40: **Mistake 1: We were neither experts nor target users of the product that we were building.**

¶41: We had never used the existing home automation products in our homes. We were not experts in the IoT sector. When you have new at something, you give yourself the famous Dunning Kruger Pass on your decisions.

¶42: "The Dunning–Kruger effect is a cognitive bias wherein unskilled individuals suffer from illusory superiority, mistakenly assessing their ability to be much higher than is accurate."

¶43:



¶44: And we did give ourselves the Dunning Kruger pass. Had we been users of existing smart switches, we would have known that the incremental value that our product was offering was quite low. Had we been experts in IoT, we would have known how to price hardware and the difficulties in building it.

¶45: By avoiding this mistake, you can avoid a lot of other mistakes which happen as a result of this one.

¶46: **Learning:** *Work on something where you are either an expert or a top user. If not, become an expert/top user. Homejoy founder Adora Cheung herself worked as a professional cleaner to understand the business.*

¶47: **Mistake 2: We did not do the due diligence on the idea before we started building the product.**

¶48: We did not understand the market and competition well enough. We also did not figure out the persona of our customer. And whether that customer was looking for the value that we were providing. We did not question whether we would be able to provide that value in that first place.(Machine Learning cannot read the human mind. Not yet!).

¶49: It is always possible to validate/disvalidate a lot of assumptions about the product, market and competition without building the full-fledged product. One way we could have done it was by selling existing products to our potential customers.

¶50: **Learning:** *I learnt this very useful method in an accelerator. Make a thorough list of hinge-breaking assumptions for your market, product and competition. Hinge breaking assumptions*

are those that can make or break your company. Rank them according to probability of the assumption being wrong and subsequent risk to company. Start validating from the top while building as less as possible.

¶51:

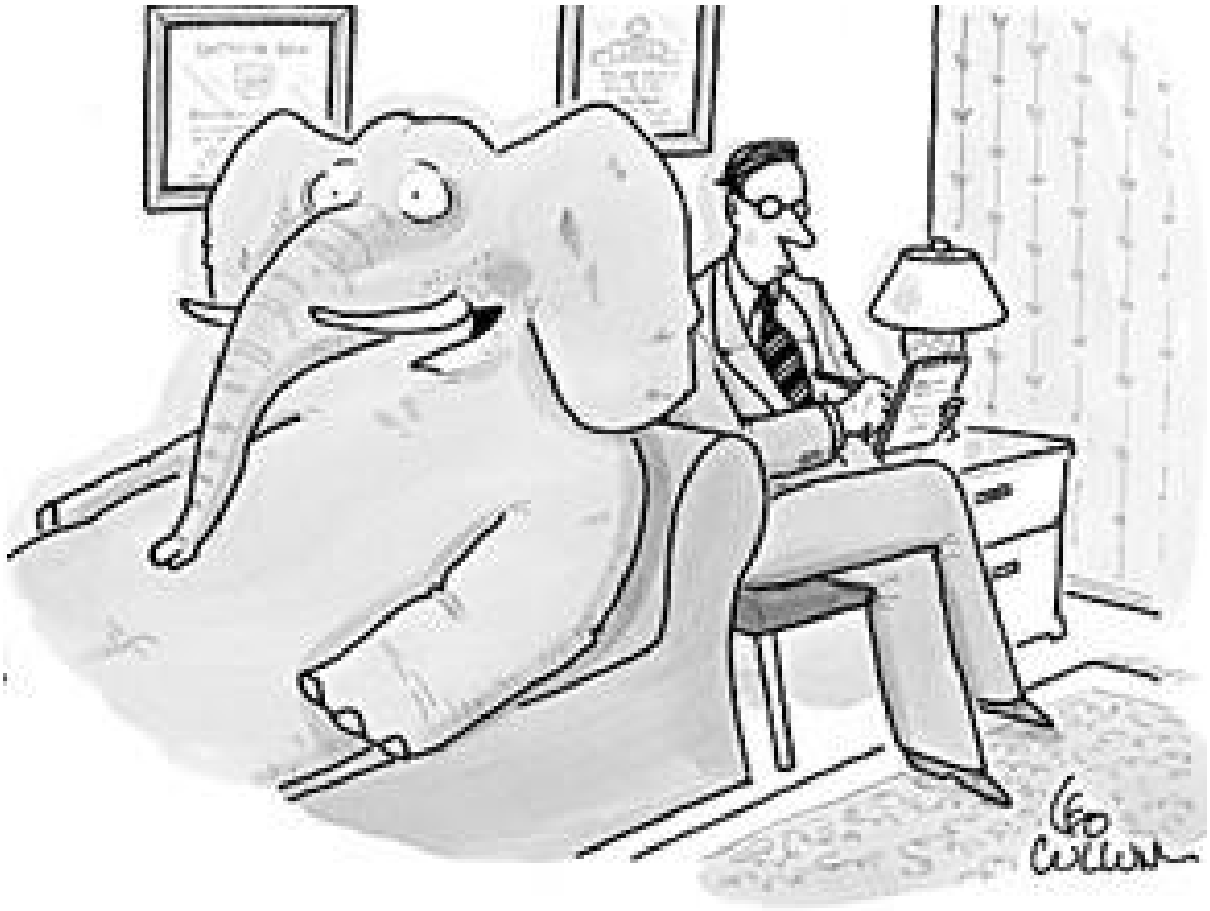
Hinge-breaking assumptions for X

Product Assumptions	Market Assumptions	Competition Assumptions

¶52: **Mistake 3: We let sunk cost bias affect our decisions about pivoting.**

¶53: It was not that we were clueless about the problems in our product. We had doubts in our minds. In a startup, you almost always have doubts. But we had built so much. We were in love with our product. And we were not ready to ask the difficult questions.

¶54:



"I'm right there in the room, and no one even acknowledges me."

¶55:

¶56: Is it okay to be doubtful about your product? Is it okay to voice your doubts and bring the team morale down? Or make your cofounders feel that you are not as committed to the idea and the vision as they are?

¶57: It helps to be transparent about your apprehensions with cofounders in the long run. It would have saved us a couple of months and some money.

¶58: **Learning:** *It is absolutely necessary for founders to be committed to the vision of the company. However, there are multiple ways to achieve a vision. Don't fall in love with one way. Accept the possibility that you might have to start things over from scratch.*

¶59: *Build a culture of transparency in your company. Encourage dissent among cofounders and deal with it objectively.*

¶60: **Mistake 4: We were trying to do everything for everybody.**

¶61: We were making switches that could automate your lights, fans, ACs and water heaters. We would have tried to automate your TV, Fridge, Oven and Car as well had it been feasible to do so. We were pitching power savings as well as luxury. This made the product and the pitch very complicated.

¶62: **Learning:** *As a startup, you are constrained in resources. So it is always better to identify and solve one problem very well instead of solving n problems in a so-so way. Nest solved the heating problem. Dropcam and Canary solved the security*

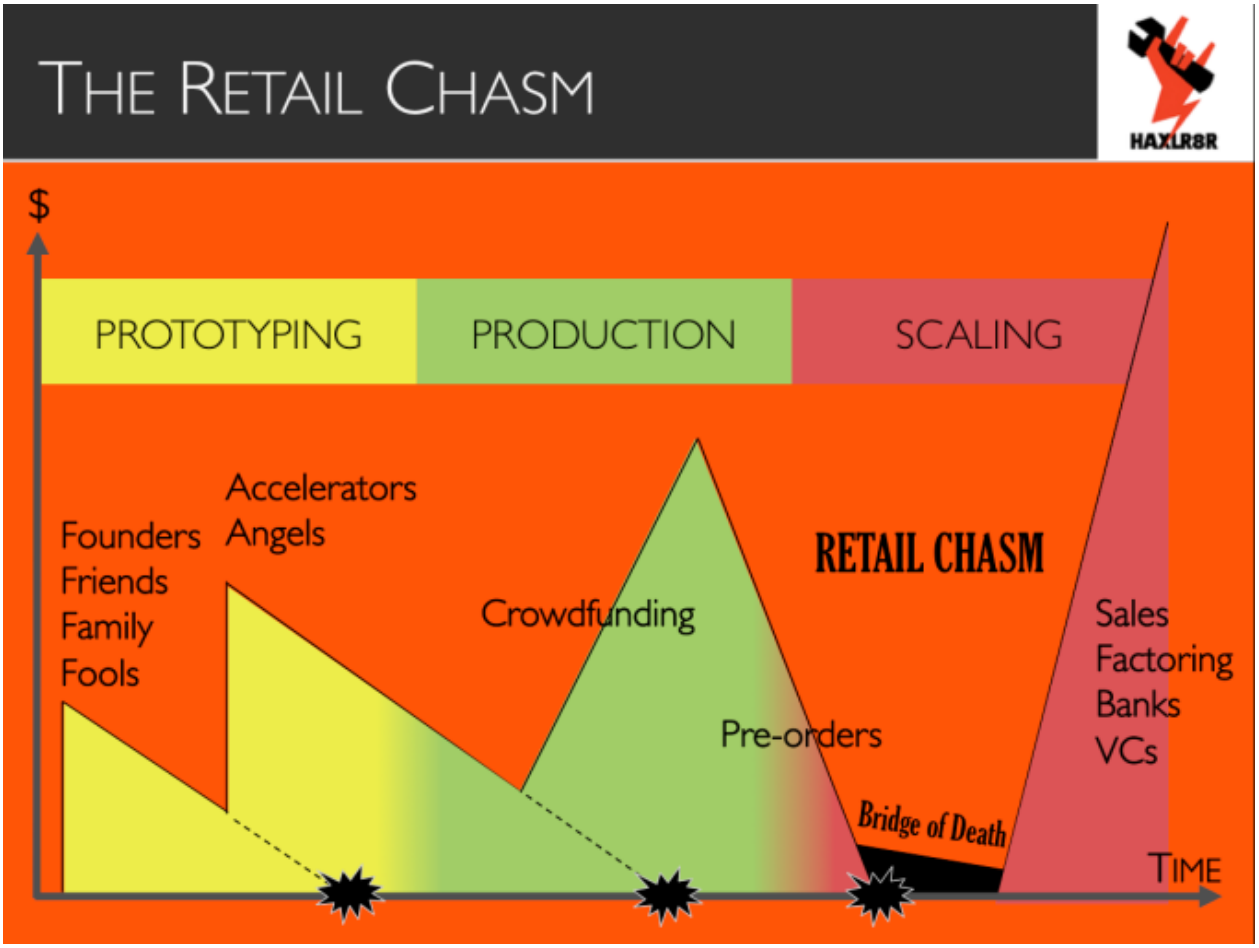
problem. Try to be a drug for your customer instead of being a vitamin.

¶63: **Mistake 5: We underestimated hardware.**

¶64: Building a successful startup is hard. Building a hardware startup is 10 times harder. Pebble, with all the Kickstarter success, is still in troubled waters.

¶65: Building a prototype is the easiest part of building a hardware startup. The real challenge comes in product design, production engineering, manufacturing, distribution and marketing/sales. And you need to have friends in China.

¶66: Also, hardware product validation and iteration cycles are much longer than software ones. Getting funding is relatively difficult; VCs ask for traction(~$1M on Kickstarter/Indiegogo last I heard)because of the inherent risk in a hardware startup. Managing cash flows is hard because you have to pay your vendors months before you get paid from your customers.
¶67:



¶68:

Source: http://techcrunch.com/2014/04/06/the-lean-hardware-startup-investing-in-hardware-startups/

¶69: We were not the right team to build a hardware company.

¶70: **Learning:** *Understand what you are getting into if you are starting a hardware company and plan accordingly. Get experienced people on your team or get into a hardware accelerator like HAXLR8R.*

¶71: So these were our top 5 mistakes that I can see in retrospect. Eventually, we ended up leaving hardware and IoT and decided to build something that solves a problem that we had experienced.

¶72: Since Gandhinagar(where Lumos was located) does not have many startups, interacting and sharing experiences with other entrepreneurs was always a big problem for us. Also, we had to subscribe to a lot of blogs (crowded inbox) just to stay updated with top content on Entrepreneurship. We decided to build FundaMine to solve this problem.

¶73: **FundaMine is a community for professionals to stay updated and interact with others in their profession.**

¶74: Currently, FundaMine has communities(mines) on Entrepreneurship, Product Management, Android Dev and IoT. Do check it out!

¶75: Drop me a line at yashpkotak@gmail.com if you have any comments or want to discuss anything in detail. If you are in Bangalore, we can also catch up for a cup of coffee!

¶76: If you liked this post, please recommend it or share it with fellow entrepreneurs!

¶77:

¶78:

The 5 reasons why hardware startups fail

techinasia.com/talk/5-reasons-hardware-startups-fail

July 18, 2016

 Daniel Ellis · 18 Jul 2016

On July 7, 2016, Theranos CEO Elizabeth Holmes was barred from owning or running a laboratory for two years. Theranos also had its licence to operate its laboratory in California revoked.

This highly consequential decision by the US government regulator, hot on the heels of Forbes' downgrade of Theranos' valuation from $9 billion to $800 million and Ms Holmes' own net worth to zero, should come as no surprise. The company has been struggling to maintain its credibility since October 2015, when its practices and technology was first brought into question by the WSJ.

As Ms Holmes' problems mounted, she famously paraphrased Gandhi by saying, "First they think you're crazy, then they fight you, and then all of the sudden you change the world."

It seems not that long ago that Theranos was held up as the shining example of a hardware startup taking on a big, established industry. It's the latest in a series of high profile hardware startup failures that includes Coolest Cooler, Zano, Makerbot, Pirate 3D, Novelsys and Better Place. There are many others. Too many to mention in one article.

But why look into failures?

Surely there are many more success stories like Tesla, Xiaomi, and Raspberry Pi that one can rather strive to emulate?

Not so simple!

Reason being that when it comes to hardware startups, the challenges seems to be remarkably similar; for failed companies and successful ones alike. Not just that, it transcends geography and industries.

Unfortunately, mistakes tend to only reveal themselves after a startup fails, so those are the best places to look in order dissect, learn from them, and create future success.

> "At some point, everything's gonna go South on you. You're going to say 'This is it… this is how I end.' Now, you can either accept that, or you can get to work. You solve one problem, and then you solve the next problem, and the next, and if you solve enough problems, you get to go home." – Mark Watney (as played by Matt Damon in the movie The Martian)

Not all failures are created equal

Prof. Amy C. Edmondson from Harvard Business School wrote an article in 2011 that asserts not all failures are equal. She splits them up into three categories:

- Preventable failures in predictable operations
- Unavoidable failures in complex systems
- Intelligent failures at the frontier (or rather… happy accidents)

In this series, I'll be looking more deeply at five overarching, preventable failures, the lessons to learn from them and the skills needed to either avoid or recover from them.

Over the next few weeks I'll be working through detailed case studies and conduct interviews to help break down and analyse the biggest challenges hardware startups face and if circumstances makes them unavoidable, look at options how to overcome them.

Unlike most similar type articles, I'll delve deep into each topic to be as comprehensive and thorough as possible. Keep in mind that although this series focus on hardware startups, the business lessons to be learned is helpful for all founders.

Without further delay, here are the 5 reasons hardware startups fail, in no particular order.

1. Engineering/technical design issues

Here I'll show how technical issues, bad product decisions, over-promising and too many changes can delay or derail a project completely.

I'll also look at the type of testing you should be doing at each project phase.

2. Superiority bias

The traits of the typical entrepreneur can, in many cases, be seen as overconfidence, arrogance, naivety or unemployability. These traits can be either a boon or a bane for the project and the company as a whole.

We'll show how to recognize and manage said traits to further increase chances of success.

3. Timing problems

Not the dark magic many people think it is. I'll provide you with the checklist to be more sure whether the timing for your concept is right or not.

I'll also use case studies to illustrate where timing has made a deciding difference in the success of a product.

4. Poor execution

Execution can refer to Operations and Decision making or Internal Admin and Regulation. I'll discuss both separately.

I'll discuss the commercialization process in detail and point out the various pitfalls along the way. The administrative process, often seen like a necessary evil when it fact, it being a structure that supports your project and company, is a strong indicator of future business success.

5. Insufficient funding

The one we obsess most about and so very often get horribly wrong.

I'll discuss the various options of funding available to hardware startups and elaborate on ones that spare you from giving away too much equity to make your dreams come true. I'll also show you how to prepare a budget for a hardware project and work through a sample product.

There are many other reasons startups fail, but speaking from my own experience and research, these are the ones that present the highest risk that are at the same time, manageable. While I do not claim to be an expert in each of these issues, I will take the necessary effort to include data, case studies and expert opinions.

Please join in the discussion and share your own experiences. Let us all learn from each other.

This article is the first of 'The Hardware Series', where the author covers in detail why hardware startups fail.

Editing by Sim Yanting

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Daniel J Ellis is firstly, trained in financial management and accounting, and secondly, a tech geek who loves playing with the latest technologies and electronics boards.