

11 Reasons Why Hardware Startups Fail and What You Can Do to Avoid it

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You've probably heard "Hardware is Hard!" several times before already. Hardware *indeed* is hard and hardware startups fail hard!

But why so? What makes hardware startups different?

Below we have listed 11 reasons why hardware startups fail and how you can avoid those failures.

This article will be useful for those of you who may be planning to start a hardware startup or may be in the process of developing a new hardware product, by giving you an overview of the things to avoid while you try to bring your hardware product to market.

1) Trying to build the next Apple/Tesla of 'X'

As a startup, an easy way to run out of all your cash is to emulate tech giants like Apple and Tesla. You simply don't have the capital to do things the way big companies do.

According to Ben Einstein (*previously founder of BoltVC*), when Apple had to manufacture the aluminium uni-body casing for the Macbook air, they bought 10,000 CNC machines to make a million of those per year.

CNC machining is expensive and as a startup you should avoid CNC machined parts in high volume products.

Instead, look for ways to alter the design of parts in such a way that they perform the same function but use a different manufacturing process like metal die-casting or sheet metal processes. These are much more cost-effective at higher volumes.

It's best to keep things simple and lean initially, and instead of being the Apple/Tesla of 'X', sell your own unique value proposition that differentiates you.

2) Not considering DFM (Design for Manufacturability)

Getting to a functional prototype is only half the battle won, the real challenge is to scale from prototype to mass production.

While prototyping boards like Arduino or Raspberry Pi may be great tools for hardware prototyping, they are not economically viable options at large scale production.

A custom PCB, designed according to your product's core functionality using easily available components is the logical step when scaling.

For the enclosure design, we come across too many designs that are either not suited for manufacturing at high volume or sometimes are just not practical to manufacture at all.

For proof-of-concept prototypes, an off-the-shelf enclosure or a basic 3D printed enclosure usually works fine. As you progress further with the development of your product, you will eventually need a professionally designed enclosure for your product.

A professionally designed enclosure provides the right combination of aesthetics, usability and functionality, while being considerate of the manufacturing constraints and other technicalities.

The importance of **DFM** (Design for Manufacturability) is often under-estimated by many founders and this can result in significant additional costs, delays and frustration down the line.

At Outdesign, we not only consider DFM when designing products, but also place huge emphasis on **DFA** (Design for Assembly) of products to further streamline the assembly process.

3) Underestimating Development Costs

The costs of electronic components and prototyping tools have come down in recent years and this trend continues. But these costs can add up quickly when manufacturing in thousands.

It is not uncommon to see hardware startups raising \$1m+ and still not being able to ship their products.

Often, it's a result of underestimating the overall development costs including certifications, assembly, packaging, warehousing and shipping, and not factoring in unexpected delays, tooling changes or defects.

Cooltest Cooler launched in 2014 was the second highest funded project on Kickstarter, raising nearly \$13 million. One would think that they raised an enormous amount of funding for their project. Of course, \$13m is a lot of money, but it could not save *Cooltest Cooler* from almost shutting down.

The underestimation of development costs has resulted in several years of delay and thousands of unhappy customers who are still waiting for their products to arrive. The company has also been on the lookout for additional external investment. Here is one of our article about *Crowdfunding on Kickstarter- Hits, Misses and Lessons Learnt.*

4) Lack of Research and Validation

Not knowing enough about your end-users' needs, desires and problems is another major pitfall that hardware startups (and every entrepreneur who wants to succeed) must be wary of.

Yet, we see too many startups creating products in a vacuum, only to realize later that they address no real problems, have no real market or a feasible business model.

Define your target audience and conduct extensive research to understand your customer base. Getting early user feedback is crucial to understanding what your target audience is actually looking for, instead of pushing down features which they don't really need.

This not only keeps you focused on solving real problems, but also helps you avoid 'feature creep'. And as a result of giving users what they ask for, the sales and marketing process also becomes more effective.

You also need a way to validate that your idea has a real market (Yes, even if your mom thinks that you have a great idea!) Crowdfunding is a great way to validate your idea.

When people are willing to pay for what you are building, it's an actual validation that your product has a market.

A successfully funded campaign also puts you in a strong position to seek funding from angel investors.

*"If I had asked people what they wanted, they would have said faster horses."**

(*quote famously attributed to Henry Ford, though without any evidence)

Unless your product is as ground-breaking as the Model T, **do ask people what they need!**

5) Listening to your Customers! (Wait...What?!)

Being passionate about your product, you might be tempted to give your customers all the features they could ask for. And while it's important to listen to your customers, you also need to work within your financial constraints as a startup and realize that you cannot make everyone happy.

Focus on a very specific need and try to address it better than anyone else. As described in the book *Universal Principles of Design* by William Lidwell, it's a Flexibility-Usability tradeoff.

Flexible designs can perform more functions than specialized designs, but they perform those functions less efficiently.

For example, "a Swiss army knife offers flexibility in the functions it can perform but is less efficient in performing the same functions when compared to the corresponding specialized tools."

More the features, higher the complexity and production costs, and higher is the number of things that could go wrong.

Mistakes in hardware startups are costly, so it's best to keep things simple when starting out. While bigger companies can afford to make mistakes, the same mistakes by a new business could mean pack-up before starting up!

6) Falling in Love with your Idea

Some founders are so obsessed with their ideas, that they are unable to accept the market realities, data or constructive criticism from their users, investors, family and friends.

A good idea alone is not enough, you need to have a market for it too. It is therefore important to keep iterating and improving your ideas as you collect more and more data from user research.

This will ensure that your product is a better fit for the market and loved by your users. We love to work with clients who are open to criticism of their idea. Mostly it leads to an end product that is much better than what they had initially set out to create, which is a win-win for everybody involved.

7) Lack of Proper Planning and Timelines

Many consumer product launches are scheduled before Christmas to capitalize on the increased sales during the holiday season. The annual Consumer Electronics Show soon follows.

If you are on a similar schedule, factor in delays caused by unexpected disruptions in your planned production schedule and add a generous buffer.

Delays can be due to multiple factors - supply chain, unavailability of certain components, quality issues, a last minute change or some flaw discovered in the product. You must also factor in important events and holidays in the country you are manufacturing in.

For example, if manufacturing in China, you must plan for the Chinese New Year much ahead of time. Here's a great article from Dragon Innovation on [how the Chinese New Year affects your manufacturing plans](#).

8) Wrong Manufacturing Partner

Unfortunately, there are numerous stories about how a startup had to halt manufacturing or reschedule due to lack of competence, commitment or timely communication from the manufacturing partners.

It therefore becomes paramount that enough diligence is carried out before engaging with a manufacturing partner.

Look for proper documentation and referrals to ensure that the manufacturer can actually do what they say they can do.

Communication is key to managing any relationship, therefore, avoid engaging with middlemen and spend as much time as possible with manufacturing company's teams on the ground.

This will not just help you gain an understanding of their local culture, processes and constraints, but will also help set expectations and define quality standards.

Choosing the right sized factory is equally important. Your 'large' order of 10,000 parts just won't get the necessary attention from a manufacturer who makes millions of parts every month. A smaller but competent manufacturer will be more willing to take your order and accommodate your requests.

9) Lack of Proper Testing

What should you do when you have a great looking prototype that works exactly as intended? You should spend enough time (and money) to test your products before you ship them out.

Understand and apply proper product testing methodologies and standards. Test rigorously for different environments and for multiple use-cases.

For example, you may have a waterproof (IPx6) product that is assembled and tested at near sea level, and is working as expected.

If the same product is shipped at a higher altitude area, the waterproofing seals might fail if the pressure difference was not accounted for while designing.

Temperature, Altitude, Moisture levels vary across regions and it is therefore important to design and test your product according to the conditions it has to operate in.

Remember, no business - big or small - wants its customers to send back products because they were faulty. And a lot more is at stake for fledgling startups - credibility, customers and costs.

10) No Competitive Advantage

Most physical products are not difficult to reverse engineer or replicate, every product is prone to copycat manufacturing. For every innovative hardware idea, there is most likely some company in China that can offer a similar product at a much lower price.

If you have a highly successful product, it will most likely get copied, sometimes even before your Kickstarter campaign ends, as we saw in case of *STIKBOX*.

Patents can help to a certain extent depending on your product idea, but they are expensive to begin with. The litigation costs in case of infringement by someone in another country with deeper pockets than you are usually not worth the hassle. And if your product is relatively easy to manufacture, it won't be just one factory that you will have to go after.

Your only competitive advantage then is to create a strong community around your product, build a brand and offer great customer support so that you are not simply selling a product, but a great end to end experience.

11) Not Enough Traction

You spend months on end perfecting little details of your product prototypes, but without giving any importance to generating interest around your idea. When you are finally done (if ever) you realize that there aren't enough users to buy (or atleast appreciate) what you have built.

You are not alone. There are so many startups that despite having a great product, are not able to take off just because they don't get that initial traction. This is because they didn't plan and implement a strong marketing strategy right from the beginning.

Start your marketing campaign early on to generate interest and build a strong fan base, so that by the time you are ready to unveil your polished prototypes, you already have a good number of people who are interested in your product. Having a marketing person as a co-founder is helpful if you are the tech guy as it complements your skillset.

Pebble pulled this off brilliantly. When they launched their first Kickstarter campaign in 2012, they had already built a list of 6000 subscribers who were interested in their product, apart from exclusive media tie-ups. As a result, Pebble got the initial traction they needed and went on to become the most funded KS project of that time.