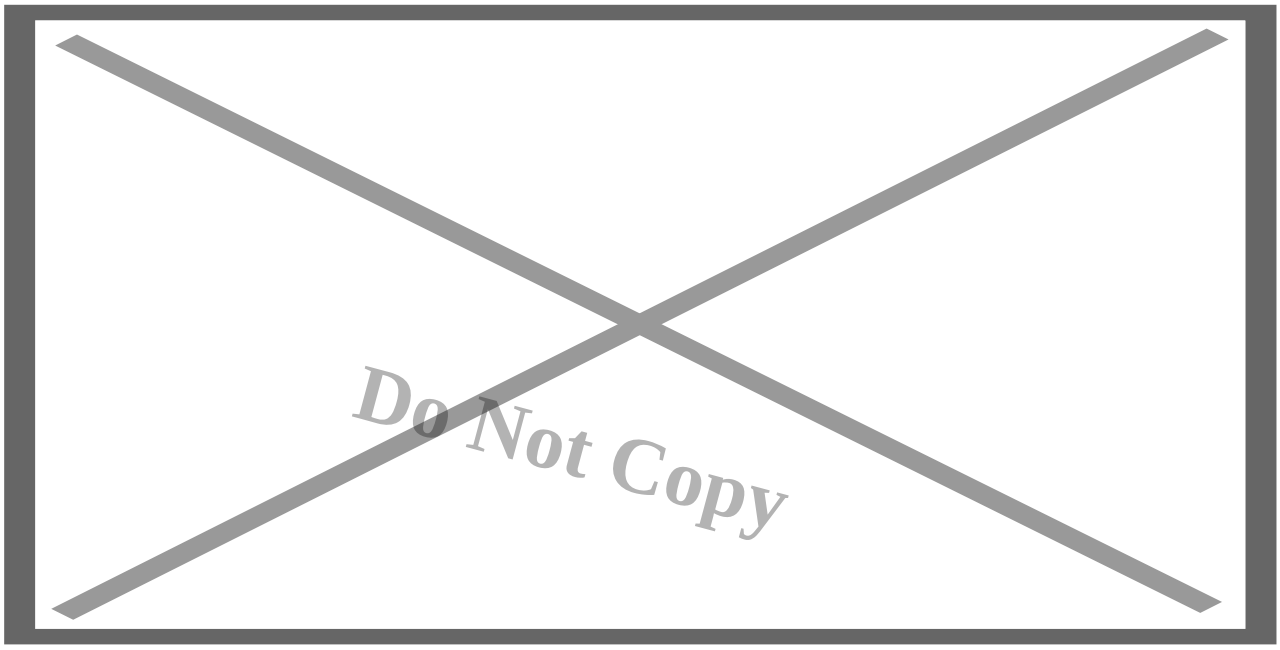
How to Design the Perfect Product

## Description




You need horns everywhere! You can never find a good horn when you are mad! And they should all play *La Cucaracha*!

I was visiting a Rockwell Collins facility discussing cabin management system development for business jets, and I had my first and life-altering introduction into real design. They had hired a little company called IDEO, to help them with designing ideas for the future. I met a couple of their designers, and I was instantly blown away and intimidating at how cool they were (coming from Palo Alto), how confident they were in discussing design language, and how their whole philosophy of human-centered design made so much sense.

I immediately looked up the company and its founder and read his book (being the overthinker I am). The book, The Art of Innovation, by Tom Kelley opened up a whole new world of how the design process should really work. Granted, it sometimes read as a big advertisement for their services, but there were serious nuggets of truth in there. We were in the middle of defining a new product at Bombardier, and I started to doubt that we were going to come up with the right one. I had to rapidly change course if we were going to disrupt the market like I knew we could.

Over the course of the next 10 years, I learned and studied and practiced what makes good product design and what needs to be thrown on the trash heap. And then set on fire. Iâ€™ve seen and done both.

# Engineers Donâ€™t Know How to Design

I can say this because Iâ€™m an engineer. We learn all kinds of really useful things, that help us be really good at technical problem-solving. How to make something as light as possible, or strong enough to withstand hurricane-force winds or better and more fuel-efficient engines. We have a really hard time design things people actually like using. Something that is intuitive, and simple and emotionally satisfying. Weâ€™re great at functional and efficient. We suck at beautiful and simple.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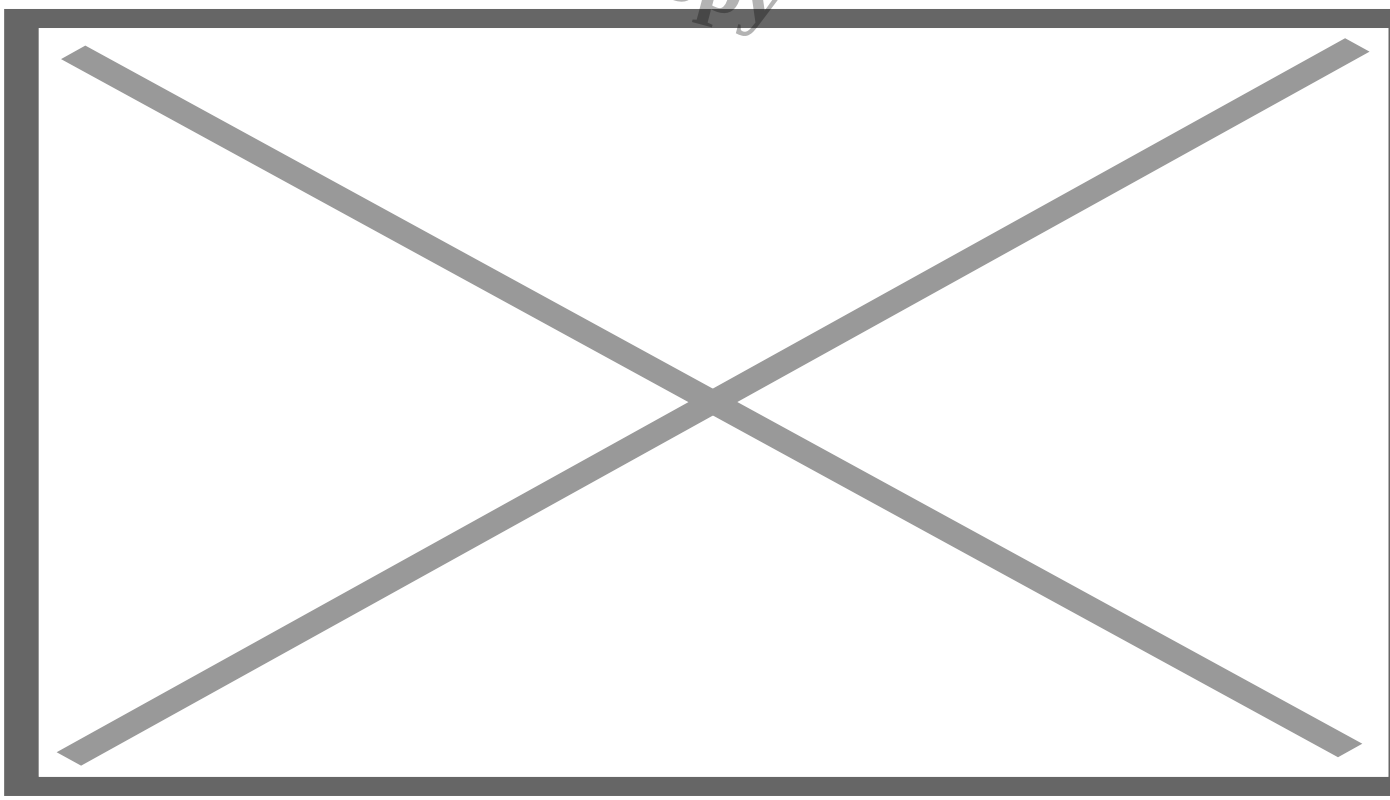
The hunt for the infamous squircle

When I was working on the Global 7500, I got into a heated argument with a particularly tough structural engineer. It was about the windows of the aircraft. I had made it a mission that we were going to make the biggest windows possible on this aircraft because that was the biggest thing in the cabin the competitor had over Bombardierâ€™s products at the time. So with the industrial design team (a first for us in product development), we created these gorgeous big beautiful windows. Big holes in fuselages mean big stresses and heavier structure. That was strike one to the engineer. We never do things in engineering that intentionally add weight. Then there was the squircle. If you have an iPhone and look at the corners theyâ€™re beautifully rounded, right? And you may think that its simply a radius of the edge but it isnâ€™t. Itâ€™s a smooth transition with a changing radius. And itâ€™s very subtle but it makes the corners look just right. The engineer nearly lost his mind fighting this difference because the squircle is not as efficient from a stress point of view as a simple radius. But I didnâ€™t care. The right design for the user of this $70+M masterpiece of an aircraft was obvious to me. When you use a simple rounded rectangle your eyes can be tricked into seeing a bump at the corner (see below). These details matter when youâ€™re staring out that window on a 12-hour flight. Product design isnâ€™t about the â€˜perfectâ€™ structure for stress or aerodynamics or strength-to-weight. Itâ€™s about creating positive emotions in the user. The engineer to this day I am sure believes I am wrong.





Subtle but beautiful difference when you design something for emotions not formulas

## Neither Do Salespeople nor Production Leaders

Never ask a salesperson what product needs to be designed. Sure, they see and hear customers every day and get all kinds of feedback on what those customers like and donâ€™t like about your product. But that doesnâ€™t mean they know what o do about it. Like the famous (but maybe not true) quote from Henry Ford

> If I had asked people what they wanted, they would have said a faster horse.
>
> *Henry Ford, maybe*

Whether he actually said it or not, I firmly believe it to be true. Customer input and feedback is essential to learning what to do next in your product, but the keyword in there is â€œlearningâ€•. Customers can tell you really important things all the time, but converting that into the next great product revolution is not their strong suit usually. So listen to what sales are telling you. Then strip it down to what it really means. Ask a lot of why questions to get to the real problem. Because if you react to exactly what they tell you, you get a car designed by Homer Simpson.

In the world of business aircraft, itâ€™s a constant battle between vast customization demands, and shorter lead-times and lower costs. I want infinite design possibilities in a week, for free. Trying to accomplish that exactly will quickly put you into bankruptcy. Understanding that customers of business aircraft need some level of personalization and emotional reaction to such a large purchase and at the same time are eager to get their hands on it, and what are the real touchpoints that they want design input on will allow you to make smarter design choice options and decide better what is fixed and repeatable to speed up manufacturing.



Production leaders tend to think also in a way that simplifies their life. They want products that are easy and quick to make, with no variation, cheap material costs, and simple to scale. But like engineers, they struggle often to capture the importance of creating the emotional response in products that the end customer needs in order to buy.

I can feel a lot of my production friends eyes rolling right now. I know costs, repeatability, lean-thinking are all super important for the long-term health of a business. But the design of products needs to factor it in at the beginning without sacrificing the essence of the product experience. During product development especially Iâ€™ve lost count the number of fights about a product feature because production costs are soaring and the production leaders will try to slash and hack away at features to meet their budgets. â€œHow many more units will we sell because that light is there?â€•. Aaaarrrgggh.

## The Essence of Human-Centered Design

The idea behind human-centered design is by itself very simple but challenging to get right. If youâ€™re making products for human beings to use, and you are a human, then maybe you know what a human wants right?

So then the process involves being very objective with your product that it works exactly like a person would want it to work. Apple famously relies on its designers as testers and focus groups because they are people too. If you wouldnâ€™t like what your product does, why would anyone else?

If you are in meetings on product design and you say something like, â€œwell too bad, the customer doesnâ€™t get everything they wantâ€•, or, â€œI bet they donâ€™t even care about that featureâ€•, or, â€œweâ€™ll include a manual to show them how to get 10 layers into the user interface to find that featureâ€•, then maybe you arenâ€™t paying attention to your own cues about what sucks about your product.

No product is truly without flaws, but the experience goal for any product should be that ideal that is never attained. Product designers should be searching for that perfect experience.

And â€œexperienceâ€• is the key. Great products arenâ€™t just functional anymore. They create an emotional memory, so you associate good feelings with the product and come back to it again and again. When you look at great products today, every detail is consciously thought out, from the packaging and shipping, to the user-interface, and weight and feel, to the haptics and sounds that it makes. All to create an experience that keeps you coming back.

In the Masters of Scale podcast with Airbnbâ€™s Brian Chesky, He talks about handcrafting the experience of Airbnb before scaling it up. Before growing to the juggernaut they are today, he spent a ton of time with a very small group of customers experimenting with the experience, gathering lots of feedback, and learning in-depth about what the â€˜perfectâ€™ experience looks like. Scaling your product up is a lot easier if people are blown away with it.



## Put Your Organization in a Blender

I visited many years ago the design studio for Mercedes in Sindelfingen, Germany. I was researching how to do really innovative design and they had just come out with the SLS (so I guess it was around 2010). The facility was magical, a tech geeks dream with virtual reality, rapid prototyping and a full-scale visualization digital theatre to present new car models to the board of Mercedes. But the thing that struck me the most was how they organized.

- There was almost no hierarchy, it was an extremely flat organization
- They worked at the manufacturing plant but in a separate building with not organization connection except at the board level. They worked completely independent of the day-to-day business
- The organization was a blend of all kinds of skill sets: Industrial Design, engineers, manufacturing experts, market research people, interior designers, and material specialists
- They were all highly competent

I am convinced if you ever want to create groundbreaking and disruptive products, then this is the best model to make it happen. You need your own â€˜Skunk Worksâ€™. Throw out your typical hierarchy, find a mad scientist to lead a group of blended experiences and abilities, and let them go crazy. It is so important to have a diverse set of capabilities because the creative process needs tension and debate. It needs many people to see things differently and avoid tunnel-vision onto one idea.

The last thing about organization is to avoid the temptation to get in there and govern whatâ€™s happening. We all want to get involved and play in this sandbox, because, letâ€™s face it, its a hell of a lot of fun. And we also want results. But patience is key. They need to follow a process (see below) but as leaders we need to let it happen. Leaders can destroy creativity if they get in there and say the

slightest thing to lean the team in a certain direction.

## D.R.I.P.I.M.

All kinds of processes exist for design cycles for new products. Hereâ€™s my version thatâ€™s worked really well for groundbreaking products.

1. Define â€“ Make a set of requirements. Every design team needs a sandbox, or you will never get anything done. Stay out of writing requirements like, â€œit needs to look and act exactly like an iPhoneâ€•. This is not the place to design but to create the limits and the end result. Things like it has to be less than $1000, or meet FDA standards, or not give people electric shocks when you turn it on are all good here.
2. Research â€“ learn as much as you can about the field. When we designed the new seat for the Global 7500 we spent an enormous amount of time learning about chairs. Research parallel industries and products, gain a history of where product design in your field is.
3. Ideate â€“ This is where you come up with new ideas. From your Define and Research stages, where are the unmet needs? What part of the product portfolio drives customers nuts? Brainstorm, gather ideas, as many as you can, sort and filter them, debate them until you get to the first pass of your new design.
4. Prototype â€“ Build a mock-up, a working version, sketches, or whatever works in your field to be able to test. Then test the hell out of it.
5. Iterate or Improve â€“ its never right the first time, we humans arenâ€™t good enough to get much right the first time. But experiment, learn, and improve until your requirements are all being met.
6. Manufacture â€“ launch your product with confidence that you are creating something special.



## Get the Best Ideas

There is an old story I heard, and I have no idea if it ever happened, but it illustrates a good point. Thereâ€™s a truck driver going across the country with a trailer thatâ€™s 14â€™6â€³ and he comes upon an overpass thatâ€™s only 14â€² clearance. He slams on the breaks and manages to stop just before but heâ€™s completely blocked traffic. The police come and they argue and discuss and try to figure out how to get him off the highway but itâ€™s all blocked behind him now too. Finally after what seems like hours a kid in a car yells out, â€œWhy donâ€™t you let some air out of the tires?â€•.

Great ideas come from anywhere. Many of your ideas will be dumb, or wrong, or misguided. So will tons of the ideas you hear. But unfiltered ideas are always where the best ones come from. Anyone in your team has the potential to solve the hardest problems. Open your mind to everyone in your team. Make your workplace psychologically safe. Have you ever felt like throwing a new idea out into a conversation is like throwing a hand-grenade? Your team doesnâ€™t feel safe to you. To get the most and best ideas, people have to feel ok with being silly or wrong, and creative. You as the leader have to show vulnerability and admit mistakes, openly ask for their inputs, praise creativity over correctness.

Donâ€™t kill ideas by shooting down the stupid ones, move on, and let new ones take over. Eventually, real gems are going to show up and energize the team. Celebrate when great ones come from unlikely places, and it will encourage even more.

# Fail, a Lot


Do Not Copy

> Iâ€™ve missed more than 9000 shots in my career. Iâ€™ve lost almost 300 games. 26 times, Iâ€™ve been trusted to take the game winning shot and missed. Iâ€™ve failed over and over and over again in my life. And that is why I succeed.
>
> *Michael Jordan*

So youâ€™ve done your research, and designed with the human in the center of your design, and think that itâ€™s going to be a home-run. Now build it, prototype it, and test it. A lot. Try to break it. Use it how everyone else will. Drop it, kick it, lose it. It will never be perfect the first time. Thatâ€™s good because every failure is an opportunity to learn and improve.

It takes courage to break new ground, and many disruptive products come from organizations that have no idea how courageous theyâ€™re being. It takes guts to put something really different out there. In order to get great products, you need to lead your team, allow them to try and fail many times, feel safe to express ideas without ridicule or rejection, and push them to take risks.

Let me know if you want to learn more how I can help you create breakthrough products!



**Category**

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