



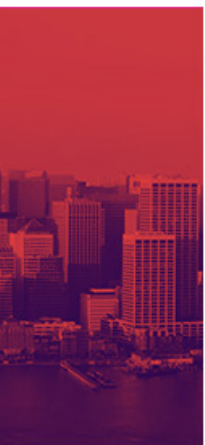
mvdit tech book

January 2019



BONE CONDUCTION AUDIO

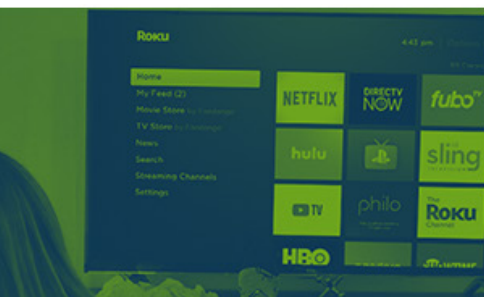
A DEEP DIVE INTO AFTERSHOKZ TREKZ TITANIUM



All about Foldable Phones

Are products being designed in and “for” california?

How could online streaming improve in 2019?



"I read a study that measured the efficiency of locomotion for various species on the planet. The condor used the least energy to move a kilometer. Humans came in with a rather unimpressive showing about a third of the way down the list.

That didn't look so good, but then someone at Scientific American had the insight to test the efficiency of locomotion for a man on a bicycle and a man on a bicycle blew the condor away.

That's what a computer is to me: the computer is the most remarkable tool that we've ever come up with. It's the equivalent of a bicycle for our minds."

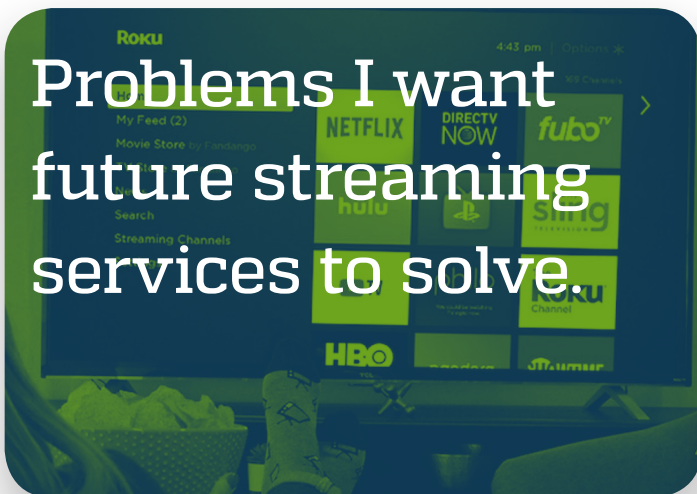
- Steve Jobs

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BONE CONDUCTION AUDIO

AFTERSHOKZ TREKZ TITANIUM

Vidit Bhargava

I recently bought a pair of Aftershokz Trekz Titanium Bone Conduction headphones. While the name's quite a mouthful (and the grammar is frankly appalling), the technology is quite interesting. Bone Conduction Audio is a departure from the traditional headphone model, and can be especially useful in some situations, which is what prompted me to get the headphones in the first place.

The tech behind Bone Conduction is rather simple instead of transmitting sound waves through air to the eardrum, a bone conduction audio device transmits the sound directly to the inner ear (cochlea), bypassing the eardrum.

Bone Conduction was discovered by Ludwig Van Beethoven, who discovered it was possible to have the perception of sound through another medium instead of the eardrums. A necessity for Beethoven, who was almost completely deaf, Bone Conduction is also helpful because it frees up the eardrum to listen to the environment.

The biggest use case of Bone Conduction audio that appeals to me is the fact that I can hear my surroundings even while I hear the music, and it seems this is why these headphones appeal to most people who got them. The only time I've seen them multiple bone conduction headphones being used in one place was at the airport store where I found them first. Almost all their staff was using them. Then there's the accessibility use case of it being useful for those with hearing difficulties.



The sound quality on my Trekz Titanium pair is decent. It's not great, not even EarPod's quality, but it's passable. One of the unique things that Aftershokz is able to do here is provide earplugs as an accessory. Insert the earplugs and the sound definitely improves. But then again, that's not why I bought Bone Conduction headphones for.

What I bought them for, was to be able to hear my surroundings while I listen to music, and at that these headphones do a good job. This is especially useful while travelling.

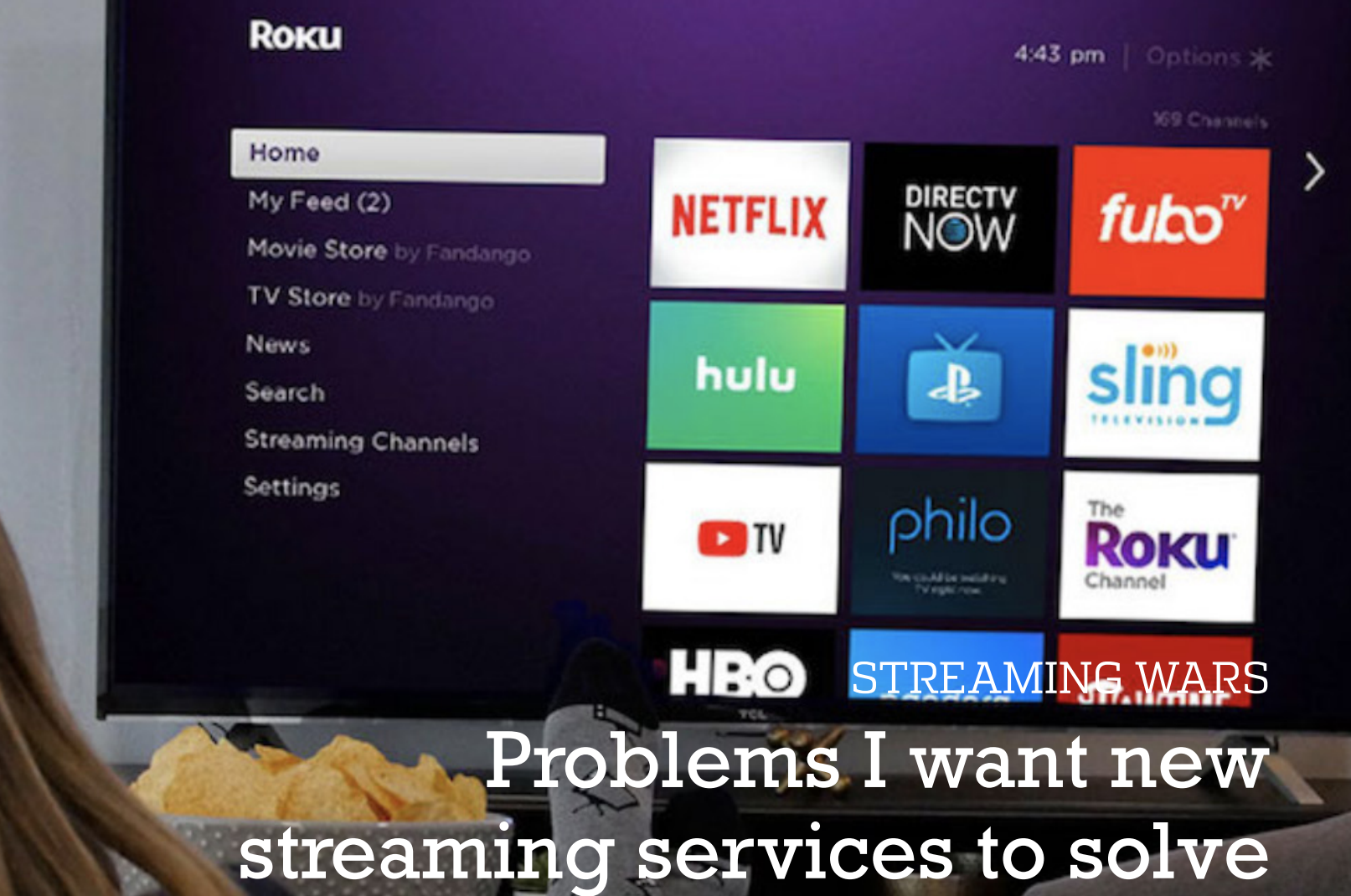


Another thing that's great about these headphones is the battery life. I bought them in December 2018, and have used them for quite some time since then and haven't needed to charge them once. The battery widget on my phone tells me they are at 90%. This is some unbelievable battery life. The one thing that bothers me with Aftershokz' headphones is that they're not the most comfortable piece of tech that I've worn. The headband style look doesn't seem to be designed as a wearable at all, it's not something that's ideal for a lot of movement, as their position keeps shifting with head movement. Moreover it's a little clunky to wear and remove them. The flexible material does help a bit, but it's still not a great experience.

The other big problem about these headphones is that the sound leaks a lot. The idea that Bone Conduction Audio can also leak sound stumped me a bit at first, after all, these aren't meant to be using air as a medium to transmit the sound waves right? Turns out I needed a bit of physics revision, since the vibrations are initiated from the earpads, skin is a medium of transmission but it's not the only medium that carries those vibrations. Plus the fact that the vibrations are more exposed to the air also makes sound leakage easier. And that's bit of a let down, and frankly if the person sitting next to me can hear what I'm listening to, it might even be a deal breaker, considering these headphones aren't cheap.

Ultimately at a price of \$99, Bone Conduction tech is still an early adopter's gadget. It's a cool tech, and one that's got a bright future as this is something that's ideal for wearable technology like Augmented reality. Afterall, I'm going to wear my AR Glasses at all times, I would want to hear what's happening around me too. But on what's available right now, there's still a long way to go in terms of sound quality, acoustics and build quality.





Problems I want new streaming services to solve

Vidit Bhargava

Content Streaming is the hot subscription service at the moment. Everyone wants to make one. The environment is conducive for the old media players (NBC, CBS, HBO, Disney etc) because they've been pros at signing content deals all these years and the market of "originals" in streaming services is just that. For the tech giants it's the ability to make such services, and these days when tech companies can create something that generates such recurring revenue, there are few who'd ask the why behind that.

But between the push and pull from old guard media producers and technology companies like Netflix and Amazon; it's the user who finds it difficult to find the bright side of having to subscribe to multiple streaming services just to watch their favourite shows. After all, isn't this fragmentation one of the reasons behind online streaming and cord cutting's success? It seems we're creating the very problems we tried to solve. So, I thought writing down some problems that I'd like future streaming services to solve.

Have something to say

In an ideal world, I'll only be selecting streaming services on the experience they provide on my device, and get all the periodical video and movies that I want to watch, without having to worry about the producer or distributor rights, but realistically that only seems like a distant possibility, In fact, instead of consolidation, we're only witnessing further fragmentation in the streaming space.

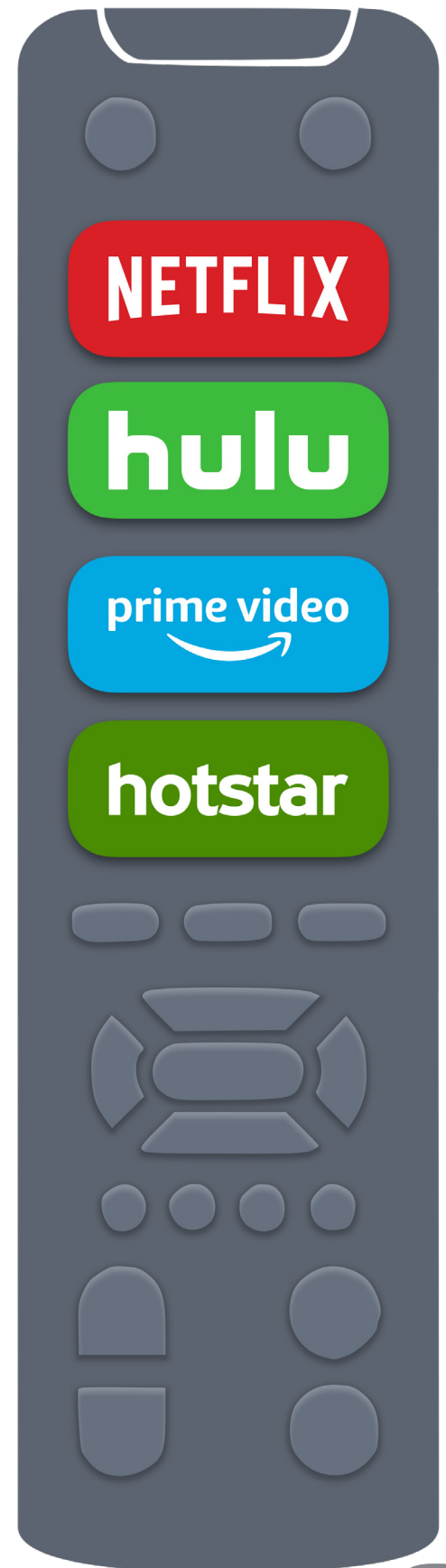
Another idea would be to have streaming services that target specific categories of content, I'd rather have five meaningfully different choices than have 5 streaming services that do the same thing but have different producers on board. A streaming service for short films, another for mainstream movies, one for foreign language films and one for indie movies would make choice so much more clearer. If I don't like foreign language movies and mainstream movies, I know which subscriptions to cancel.

Enable all content creators to put their content

It's 2019 and content creation still involves producers and distributors as barriers of entry. So many independent movies never turn up anywhere online even though they have successful runs in film festival, a lot of great movies only end up being on Vimeo or YouTube, which frankly aren't the best modes of discovering new movies or shows.

The big services like Netflix, Prime Video, etc. usually reach out to the filmmakers instead of them being able to put their movies on the platform. With so little friction for creators to put their video online everywhere else, it seems counter intuitive that content creation in the field of entertainment video needs to go through so many hoops before making it to the user. If you've got a story to tell, you shouldn't have to worry about the distribution of that story, streaming services should take care of that.

YouTube and Vimeo do that to some extent today but both YouTube and Vimeo are a lot more than avenues for periodicals, making discovery more diluted and at the moment ads seem to be the only viable model for creators to make money on YouTube.



Region Locks are a thing of the last century.

Much like the friction behind sharing content, having your content region locked is counter intuitive today. I just as likely to watch reruns of “The Office”, even though I’m Indian and we’ve never had NBC on Indian Television. So, the idea of “The Office” or any of NBC’s future hits, moving to an NBC Streaming service that’s USA only, feels user hostile to me.

So if we’re going to have US TV Producers make TV services, I’d like them to be available everywhere, the entire region locking thing worked and was reasonable when these shows were broadcasted to cable networks. On the internet, every website is accessible by everyone and the same is true for video in most cases, plus there seems to be little effort in terms of technology to make stuff globally available today. Also, Netflix and Prime Video do this with their originals at the moment, in every country that they’re available in, Netflix and Prime Originals show up just as you’d hope them to.

I don’t mean that these producers should setup operations in every major country, their ambitions don’t seem to be as large at the moment. I just hope they make their content available everywhere. NBC doesn’t need to start producing Indian shows, if just makes their existing and new ones available to everyone that’ll be fine.

Make a good streaming app, or make a boiler-plate app.

While most tech companies that are pursuing video streaming get this right, almost everyone else seems to struggle with the core principle behind an online streaming service: Video Streaming. The experience of streaming video on such apps ranges from slow and reliable to downright unusable.

In a recent encounter with “Zee5”, the Indian Zee Entertainment company’s streaming service, the experience of loading and watching a movie on their TV app was so unreliable that I ended up using AirPlay to use it. In another encounter with “Eros Now”, Eros International’s long standing service, the App crashed multiple times when I was trying to watch a movie I had downloaded for my in-flight entertainment. Even the scrubbing was unreliable, and this is on an offline video.



I'd much rather have boiler plate apps that make use of the system controls for video playback than have apps that try to do fancy interfaces and then fall flat in terms of performance.

— 2019 is in many ways the year when we're scheduled to see an outburst of streaming services, and at surface nearly everyone's interests seem to be skewed towards their interests. Production Houses want to maintain their status quo, and definitely have an advantage of experience when it comes to making original content. Tech companies see online streaming as a growth opportunity and originals as a differentiator from their competitors. So almost everyone wants exclusive content that they own. Unfortunately, for the user it means that the best shows are probably going to be scattered across multiple streaming services. I'm not very optimistic that the problems I highlighted above would be on a lot of people's agenda, but then it again it might just take one streaming service to be a trend setter.



Designed for California?

Most of the gadgets and software today we use were designed in California, but are they also being designed only for California?

Vidit Bhargava

Over the last decade, the phrase “Designed in California” has become a popular phrase that’s synonymous with product quality and good design. But it’s also become apparent that there is a flip side to being designed in California, sometimes the designers overlook the rest of the world!

Products designed by people living in urban parts of developed countries can sometimes overlook things like *slow internet connectivity, power cuts, improper road networks*, etc. I stay in India and as someone who stays in a place that is significantly different from the Silicon Valley, it’s sometimes jarring to see how products often assume things that aren’t true for a lot of places outside the valley.

Over the last few months, I’ve been trying to collect instances where products failed to be inclusive to their audiences around the world, *and* products which did a good job at showing empathy towards their users.

Starting with some examples where products could offer better, localised experiences:

Transit Directions

Transit Directions in Google Maps assume that I can walk 10-15 minutes to my nearest Metro Station, but that's not how transit works in India. Last mile connectivity here involves Rickshaws, e-rickshaws (Electric Rickshaws are three wheeled electric vehicles that carry 4-5 people at a time), Auto-Rickshaws, an Uber or sometimes even a combination of these. Walking is only feasible for a much shorter distance of travel, so for relevant Public Transit directions, a maps app must consider these factors to decide my travel duration. When they aren't accounted for, transit directions become less useful. Moreover, such modes of transport for last mile connectivity are also used in a lot of other Asian countries as well, but even after years of introduction transit directions from popular maps applications fail to be useful to the users.



eRickshaws are an important part of the last mile connectivity in public transit, perhaps even more than walking

Smart Home devices that can't handle power cuts

In the last couple of years, I've tried multiple Home automation devices, and one of the biggest problems that's stopped me from using them frequently is their ability to cope with power cuts. Every time there's a power cut, these devices get reset & you have to go through many hoops and troubleshooting steps to get them to work again.

The fact that power cuts wasn't on the quality checklist of a device, wouldn't be surprising to anyone in the Silicon Valley or any major city in the US,

power cuts aren't all that common there. But that's not the same everywhere else in the world.

Speech Services in Languages other than English

If you're someone who uses text to speech tools or VoiceOver on your phone, and understand anything other than English, you're probably used to a tinny metallic voice reading out text to you, instead of an eloquent machine learning enhanced voice that's designed to match a human voice. Perhaps we need a more diverse community of developers to ensure that Machine Learnt almost human sounding voices aren't just restricted to speaking English.

People use the English keyboard to type in languages that don't use the Latin Script

Ok so this one's probably hard to understand for a lot of people, but people in India transliterate Hindi phrases to Latin scripts very often, and then use the English keyboard on their phones to communicate with other people, and this is probably even more common for people who communicate in languages other than English that use the Latin script.

The problem? Auto-Correct systems are designed to understand and predict English for the English Keyboard, and have difficulty understanding other languages.

iOS has made improvements in this field and now provides a "Hinglish" keyboard for typing Hindi phrases in English and a Hindi transliteration keyboard for typing in the Devanagari script while using the English Keyboard, but constantly switching keyboards isn't the best solution, and it'd be even



better if the keyboard were smarter to understand these nuances and suggest auto correct accordingly. Moreover, these improvements took years to appear on iOS. They weren't in the first version, nor the second version, they appeared in iOS 9!

Examples where products understand the international requirements:

Internationalisation on iOS

One of the best examples of inclusive design is how iOS adapts to your language settings. Change the preferred language to one that's written from right to left and the entire phone's interface changes context similarly.

Contextually well designed keyboards are also a plus, In the Japanese keyboard you can draw the symbols. And even though it's a pretty late addition to iOS, The Hindi transliteration & Hinglish keyboard for Hindi speakers are definitely praiseworthy. All of these add to a good user experience regardless of the person's location.

Siri understands your location

It's cold in Delhi at the moment, what temperature exactly? 15 degree celcius. Now, that doesn't cold to a lot of people, and sure enough if you were to ask Siri whether it was cold outside, she wouldn't consider it cold. But "cold" is a relative term. For us Delhlites, anything below 20 means we've got our sweaters and jacks on, and so it was a pleasant surprise to see Siri understand this, and tune what it considers to be cold according to the person's location.

Another area where Siri seems to be aware of the location, is the pop culture references and its knowledge of Indian festivals. Wish her Happy Diwali, and Siri jokes about saving her a laddu.

Ofcourse these things don't add upto real functionality, but it's good to see that the software understands that not every one lives in the same climate or location.

Google Assistant's ability to understand Hindi

One of the good things about Google assistants is its ability to understand and speak in multiple languages, including Hindi. It's probably the first



voice assistant to do so and while it's not the Google Wavenet voice, it's still good to see how Google's embracing more languages quicker than anyone else.

Also, Google's Hindi language understanding is commendable, it understands Hindi but also picks up words that may not exactly be in a Hindi dictionary, so if you aren't a Hindi purist you can still have Google Assistant answer your queries.

Yes, Google Assistant has many privacy concerns, (who wants to upload their contacts list, when they just need to get the weather), but credit



where it's due, I think more Virtual Assistants should learn from Google's, it knows how to implement foreign language support in a voice assistant.

Uber embracing the local mode of transport

Uber's many practices in the past have been the subject to much scrutiny, and rightfully so. While I'm not a fan of how Uber treats its employees, drivers, or how they collect their data, one thing that's commendable is Uber embracing the local mode of transport in India, the famous Auto-Rickshaws. It's a case of a company understanding the needs and existing paradigms of its users and moulding their product around it, instead of pasting their old model into the app.

There are places where I'd still consider using an Auto-Rickshaw, because the distance is so much shorter and for those who use Uber, it's great that that's an option. (I don't prefer using it anymore but that's certainly not because Uber isn't tailored to an Indian customer's needs)

Pricing that's location sensitive

A couple of months ago, I wanted to attend an online course, dreading the US Dollar to Indian Rupee conversion, I went to the checkout page. To my delight, the website not only acknowledged the fact that I was an Indian buyer (so my payment would be processed in INR) but also offered a discounted rate, understanding that the actual cost would be a little too expensive for non-US residents. I was delighted by the empathy shown by the designers of the website.

Location Sensitive pricing always works. A \$9.99 (~Rs. 700) Apple Music subscription would never work in India, and predictably so, Apple understood that, and offers their music subscription at Rs. 120 (\$1.69) per month, moreover it further offers a discount to students, making it Rs. 60 (\$0.84) per month. Prime Video offers similarly location sensitive prices, and it works!

Understanding that your customers don't always have the same buying capacity, is not only an inclusive decision that shows a lot of empathy, but as it turns out it's also great for business.

Much of the software and hardware that we use today, is designed by companies that are headquartered in one of the most prosperous places in the world. However, these products are used globally, and as more and more people get access to these products, there's an increasing need to be inclusive towards everyone. It's the technology that should adapt to humans, not the other way round. Designed in California is fine, but Designed for California? Not so much.



CES 2019

FOLDABLE SMARTPHONES

There's great promise in the idea of a foldable phone. Imagine a device that when placed open to it's entire width would act as a Tablet, and when folded would act as a smartphone. It's an idea that's been explored by many a science fiction movies and TV Shows, and it's an idea that has its fair share of advantages as well: It makes your computer even more portable and It reduces the need to carry multiple devices.

I would definitely want something like this, if it were to be implemented nicely, and it seems there was quite a plethora of foldable smartphone implementations to pick from at CES this year, but what we've seen so far doesn't seem particularly interesting.



Samsung's Foldable Phone

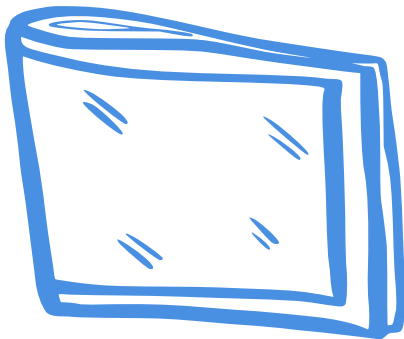
Last year Samsung showed its prototype for a foldable smartphone. It's interesting how Samsung's implementation is different from pretty much all others in the industry. Instead of folding over its back, it folds inwards and then a second display turns on to show the phone. It seems an interesting way to approach the foldable screen, and one whose benefits over something where the screen bends around the edges of the fold, aren't immediately identifiable





Xiaomi's Double Fold

Xiaomi has an interesting take on the foldable phone. Instead of a single fold, it makes a double fold from the edges. Such a double fold. Such a double fold eliminates the giant air gap on one side but makes too smaller ones on both the edges. Judging from the video of the prototype itself, it's hard to figure out if the double fold also means that I could make a partial fold by folding one side of the of the display.



The Royale FlexPai

The royale Flex Pai is how you'd envision a foldable phone. Something that folds like a piece of paper, along with it's screen. Unfortunately though, it's not as thin as a sheet of paper, which means that it also has a giant air gap between the folds, and that gives it a weird off balance look.

It seems like there's no elegant way to fold a smartphone. The Royale Flex Pai's method of folding would be great if the device itself was significantly thinner. The Xiaomi Double Fold looks like a good solution given that the fold is more elegant than the rest of the small pool of current competition, but it'll be interesting to see how well it feels in the hands.

Another major issue with foldable phones is the thickness that they tend to have once folded. A smartphone that's roughly 16mm thick is a ridiculous idea today. Another factor to note would be the weight of such

a phone. The royal FlexPai weighs around 320gm, which is more than twice the current weight of my smartphone.

Thickness & weight are two things that people have come to take for granted, and while at surface they may not seem to contribute much, they're an important factor in the usability and ergonomics of a smartphone. You'd have a tough time to using a 16mm smartphone that weighs 320gm and is the size of a phablet.

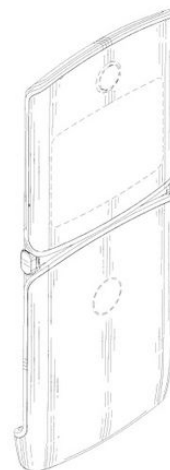
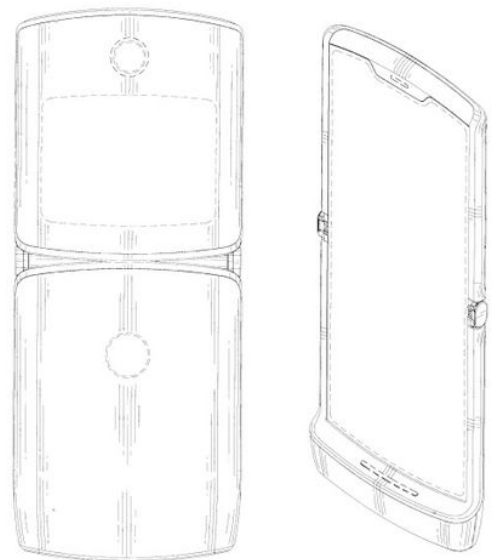
Also, a foldable phone when unfolded isn't very large either. These demos are that of very large smartphones that transform into very small tablets. So what are they eliminating exactly? The most usable tablets aren't the 7.8" devices, they are the 11" or 12.9" ones that have a form factor that's large enough to perform complex creative tasks. Would a 6.5" smart phone be any better than a phone that can turn into a 7.8" tablet? I don't think the trade-offs are worth it.

A foldable large phone that turns into a smaller phone

What if we went the other way though? Turning the current large smartphone into a tiny one by folding it into half? Is there a benefit to such a device? Motorola's upcoming RAZR seems to think so.

On one hand, it does seem like a decent idea to have get two smartphones rolled into one. A large screen for content consumption, a smaller one for, say checking messaging, answering phone calls, etc. But on the other hand, do I really need a small screen? And at what point does that task become more convenient on something like a smart watch? I don't see a real need to have a small phone, much less a large one that folds into one.

Foldable smartphones are definitely an interesting idea and one that's got some unique technological challenges. It's fun to observe improvements in both the ideas surrounding foldable smartphones as well as the technological improvements that help in making them. However, going by the current devices, it seems like it'll be a while before foldable smartphones are a consumer rage.



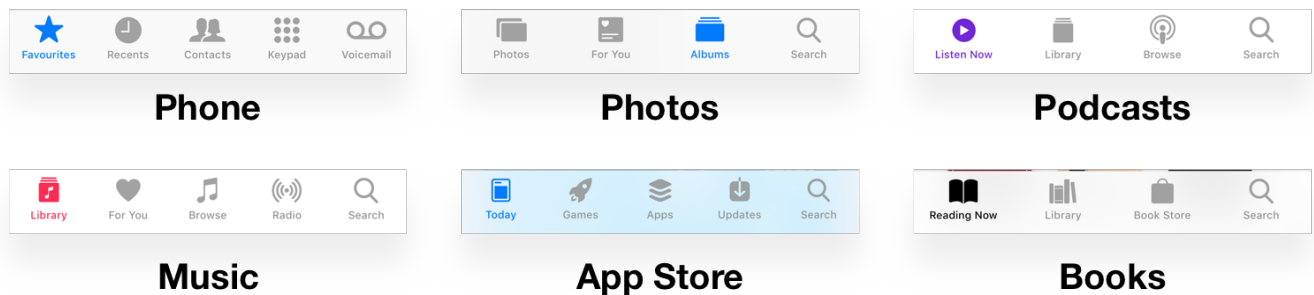
Motorola's RAZR comeback will be more about a pocketable phone, than a tablet that can turn into a smartphone

DESIGN NOTES

WHAT I WANT UIKIT ON MAC APPS TO BE

If you use apps and websites like I do, you’ve probably seen a “Home” tab on many them. It’s usually meant to tell the user that it’s the *first screen* in a number of screens. It’s where you start your navigational journey.

I’ve been thinking about the name “Home”. It’s not really an intuitive name for the first screen on your tab. It doesn’t contain any meaning that’s relevant to the screen’s function. It’s a lazy title slapped to the screen that’s meant to be the screen that’s shown to you when you open an app and doesn’t offer any information about the screen at all. I feel, It can definitely be labelled better. So, I looked closely at the tab bars of some apps, and indeed, digging through the UI of the default apps on my iPhone, I was able to find examples that support my idea. **There isn’t a single default iOS app that contains ‘home’ as the title of a tab**

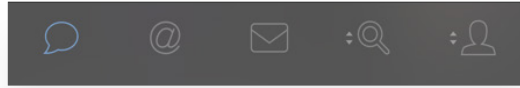


Notice how each of the different states in the apps have an icon that’s contextual and a title that’s relevant to the purpose of the tab? There’s meaning associated with each of the names.

The twitter app on iOS is guilty of the home tab laziness. They call their timeline “Home”. On the other hand, Tweetbot calls it’s timeline “Timeline” (for some reason their icons don’t display text labels, but the navigation bar titles suggest these names), a slightly more appropriate title for the twitter feed.



Twitter



Tweetbot

Apollo: The Reddit Client

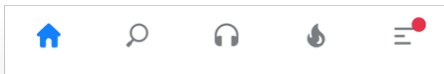
Apollo's first screen is called "Posts". It's a simple title with icon that's descriptive enough to let you know that it's a text + images timeline you're going to look at.

Instagram

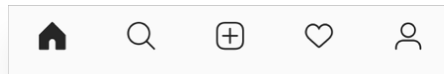
Instagram uses a "Home Glyph" for its first screen. It could easily be replaced with something like "Posts", "Feed" or even "Timeline".

BookMyShow

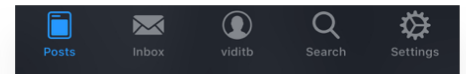
BookMyShow the ticketing service also uses the home glyph, for the screen that's supposed to let you book tickets. How about "Book Tickets", or just "Tickets" for a title?



Book My Show



Instagram



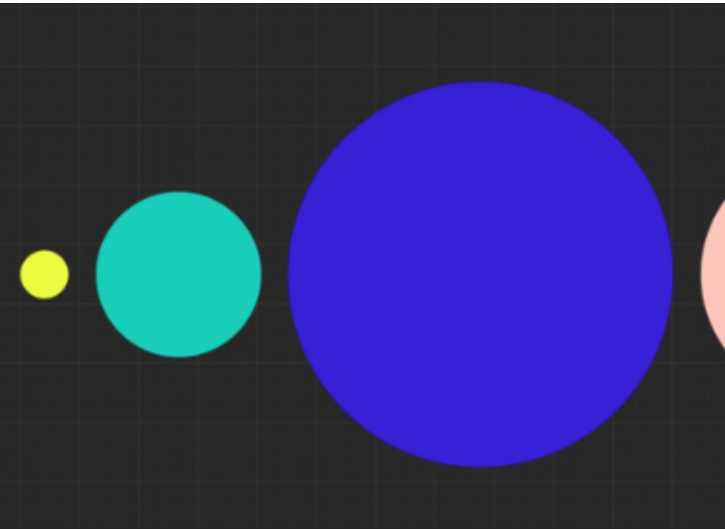
Apollo

Netflix vs Prime Video

Netflix's first screen is called "Home" while Amazon Prime Video's first screen is title "Browse". While "Browse" is fairly descriptive of the purpose of that screen, even if it doesn't always encompass every thing that the screen does (also shows your watch list and the movies that you're currently watching). Home doesn't really offer any information.

There are more examples for apps that do or don't use the Home as a tab bar button, but it's easy to observe here, that sometimes lazy design practices easily seep into apps, and form an unhealthy tradition of sorts. There's no reason for Instagram's and Twitter's timelines to be called Home. But it's been a convenient name given to the first screen. And that tradition's carried on. I hope more apps switch to clearer navigation structures.

Pixel Quiz January 2019



Q1. Designed by Travis Kochel, X uses the OpenType font features to create a useful utility out of a typeface. For example: Typing 50 using the X font renders it into a semi circle. The reason behind creating X was to make it easier to edit a particular visual element in graphic design software. The existing methods would often require recreating the element every time you wanted to make an edit, and thus X was born. X uses Open Type's Stylistic alternatives to provide different visual styles such as bubbles and floating rings. A photo of X in the Bubbles stylistic alternate is shown. What is the X font used to generate?



Q2. “They told him they’d have to cut his pocket money if he keeps doing it, so he got really angry and chucked his X out of the window.” Is a quote about Y, from a popular book. The interesting bit is, the incident quoted took place in the summer of 1994 and the X wasn’t released until December 1994, and therefore Y couldn’t have had a X in 1994. A certain Wiki suggests that X could’ve been a prototype that was pre-ordered directly from the manufacturers & knowing Y’s behaviour, that doesn’t sound like a far fetched idea, especially given the job Y’s dad had at a drill manufacturing facility. Who is Y, and What is X?

Q3. Made by a Chinese company called 9oFun, the Puppy 1 is a smart suitcase that follows you around, so you don’t have to drag it. To add a “gravity adaptive system”, something crucial to it moving all by itself, 9oFun collaborated with X, which uses this technology in its infamous product line. In 2018, X became famous for creating their “SE 3” product,

which grew in popularity after a certain category of services saw a meteoric in major US cities. The SE3 major competitor in this market is Xiaomi. Look at the image and identify X.

Q4. Biohax Technologies is a Sweden based technology company that specialises in a certain type of gadget X. X is a rage amongst the Swedes, designed to make life easier for its users, X makes it convenient to unlock smart home locks, stores eTickets for rail travel, and also contains a user's emergency contact information. Put funda and explain what is X, and how's it integrated into people's lives.

Q5. This a screenshot from the original manual of a popular game. It's the story behind the game (popularly, it's assumed that the game didn't have any). Identify the game.

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Text View:      \MANUAL.TXT      Col 0      39,341 Bytes      1%
*****
I. THE STORY
A. Background
    You get the phone call at 4 a.m. By 5:30 you're in the secret
    installation. The commander explains tersely, "It's about the Slipgate
    device. Once we perfect these, we'll be able to use them to transport
    people and cargo from one place to another instantly.

    "An enemy codenamed [REDACTED] is using his own sligates to insert death
    squads inside our bases to kill, steal, and kidnap.

    "The hell of it is we have no idea where he's from. Our top scientists
    think [REDACTED] not from Earth, but another dimension. They say [REDACTED]
    preparing to unleash his real army, whatever that is.

    "You're our best man. This is Operation Counterstrike and you're in
    charge. Find [REDACTED] and stop him ... or it ... You have full authority
    to requisition anything you need. If the eggheads are right, all our
    lives are expendable."
```

```
1Help 2Unwrap 3 4Hex 5 6 7Search 8Viewer 9Print 10Quit
```