How Technology is Hijacking Your Mind: From a Magician and Google Design Ethicist

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Fooling people is far easier than convincing them they've been fooled.

I'm an expert on how technology hijacks our psychological vulnerabilities. That's why I spent the last three years as a Design Ethicist at Google, caring about how to design things in a way that defends a billion people's minds from getting hijacked.

When using technology, we often focus optimistically on all the things it does for us. But I want to show you where it might do the opposite.

WHERE DOES TECHNOLOGY EXPLOIT OUR MINDS' WEAKNESSES?

I learned to think this way when I was a magician. Magicians start by looking for blind spots, edges, vulnerabilities and limits of people's perception, so they can influence what people do without them even realizing it. Once you know how to push people's buttons, you can play them like a piano.

My mom has this great photo of me as a kid, performing sleight of hand magic at her birthday party, which I've realized is exactly what product designers do to a person's mind. They play people's psychological vulnerabilities (consciously and unconsciously) against them in the race to grab their attention.

I want to show you how they do it.

Hijack #1: If You Control the Menu, You Control the Choices

Western Culture is built around ideals of individual choice and freedom. Millions of us fiercely defend our right to make "free" choices, while we ignore how those choices are manipulated upstream by menus we didn't choose in the first place.

This is exactly what magicians do — they give people the illusion of free choice, while architecting the menu so that they always win, no matter what you choose. I can't emphasize enough the depth of this insight.

When people are given a menu of choices, they rarely ask:

- "What's not on the menu?"
- "Why am I being given these options and not others?"
- "Do I know the menu provider's goals?"
- "Is this menu empowering for my original need, or are the choices actually a distraction?" e.g. an overwhelmingly array of toothpastes —> How empowering is this menu of choices for the need, "I ran out of toothpaste"?

For example, imagine you're out with friends on a Tuesday night and want to keep the conversation going. You open Yelp to find nearby recommendations and see a list of bars. The group turns into a huddle of faces staring down at their phones comparing bars. They scrutinize the photos of each, comparing cocktail drinks. Is this menu still relevant to the original desire of the group?

It's not that bars aren't a good choice, it's that Yelp substituted the group's original question ("where can we go to keep talking?") with a different question ("what's a bar with good photos of cocktails?") all by shaping the menu.

Moreover, the group falls for the illusion that Yelp's menu represents a complete set of choices for where to go. While looking down at their phones, they don't see the park across the street with a band playing live music. They miss the pop-up gallery on the other side of the street serving crepes and coffee. Neither of those show up on Yelp's menu.

Yelp subtly reframes the group's need "where can we go to keep talking?" in terms of photos of cocktails served.

The more choices technology gives us in nearly every domain of our lives (information, events, places to go, friends, dating, jobs), the more we assume that our phone is always the most empowering and useful menu to pick from. But is it??

The most empowering menu is different from the menu that has the most choices. But when we blindly surrender to the menus we're given, it's easy to lose track of the difference:

- "Who's free tonight to hang out?" becomes a menu of most recent people who texted us (who we could ping).
- "What's happening in the world?" becomes a menu of news feed stories.
- "Who's single to go on a date?" becomes a menu of faces to swipe on Tinder (instead of local events with friends, or urban adventures nearby).
- "I have to respond to this email." becomes a menu of keys to type a response (instead of empowering ways to communicate with a person).

All user interfaces are menus. For additional examples, see Joe Edelman's *Empowering Design* talk.

When we wake up in the morning and turn our phone over to see a list of notifications, it frames the experience of "waking up in the morning" around a menu of "all the things I've missed since yesterday."

A list of notifications when we wake up in the morning — how empowering is this menu of choices when we wake up? Does it reflect what we care about? (from Joe Edelman's *Empowering Design* Talk)

By shaping the menus we pick from, technology hijacks the way we perceive our choices and replaces them with new ones. But the closer we pay attention to the options we're given, the more we'll notice when they don't actually align with our true needs.

Hijack #2: Put a Slot Machine In a Billion Pockets

If you're an app, how do you keep people hooked? Turn yourself into a slot machine.

The average person checks their phone 150 times a day. Why do we do this? Are we making 150 conscious choices?

How often do you check your email per day?

One major reason why is the #1 psychological ingredient in slot machines: intermittent variable reward. If you want to maximize addictiveness, all tech designers need to do is link a user's action (like pulling a lever) with a variable reward. You pull a lever and immediately receive either an enticing reward (a match, a prize) or nothing. Addictiveness is maximized when the rate of reward is most variable. Does this effect really work on people? Yes! Slot machines make more money in the United States than baseball, movies, and theme parks combined. People get 'problematically involved' with slot machines 3–4x faster relative to other kinds of gambling, according to NYU professor Natasha Dow Schull, author of *Addiction by Design.*

But here's the unfortunate truth — several billion people have a slot machine their pocket:

- When we pull our phone out of our pocket, we're playing a slot machine to see what notifications we got.
- When we pull to refresh our email, we're playing a slot machine to see what new email we got.
- When we swipe down our finger to scroll the Instagram feed, we're playing a slot machine to see what photo comes next.
- When we swipe faces left/right on dating apps like Tinder, we're playing a slot machine to see if we got a match.
- When we tap the # of red notifications, we're playing a slot machine to what's underneath.

Apps and websites sprinkle intermittent variable rewards all over their products because it's good for business.

But in other cases, slot machines emerge by accident. For example, there is no malicious corporation behind all of email who consciously chose to make it a slot machine. No one profits when millions check their email and nothing's there. Neither did Apple and Google's designers want phones to work like slot machines. It emerged by accident.

Hijack #3: Fear of Missing Something Important (FOMSI)

Another way apps and websites hijack people's minds is by inducing a "1% chance you could be missing something important."

If I convince you that I'm a channel for important information, messages, friendships, or potential sexual opportunities — it will be hard for you to turn me off, unsubscribe, or remove your account — because (aha, I win) you might miss something important:

- This keeps us subscribed to newsletters even after they haven't delivered recent benefits ("what if I miss a future announcement?")
- This keeps us "friended" to people with whom we haven't spoke in ages ("what if I miss something important from them?")
- This keeps us swiping faces on dating apps, even when we haven't even met up with anyone in a while ("what if I miss that one hot match who likes me?")
- This keeps us using social media ("what if I miss that important news story or fall behind what my friends are talking about?")

But if we zoom into that fear, we'll discover that it's unbounded: we'll always miss something important at any point when we stop using something.

- There are magic moments on Facebook we'll miss by not using it for the 6th hour (e.g. an old friend who's visiting town right now).
- There are magic moments we'll miss on Tinder (e.g. our dream romantic partner) by not swiping our 700th match.
- There are emergency phone calls we'll miss if we're not connected 24/7.

But living moment to moment with the fear of missing something isn't how we're built to live.

And it's amazing how quickly, once we let go of that fear, we wake up from the illusion. When we unplug for more than a day, unsubscribe from those notifications, or go to Camp Grounded — the concerns we thought we'd have don't actually happen.

We don't miss what we don't see. The thought, "what if I miss something important?" is generated in advance of unplugging, unsubscribing, or turning off — not after.

Hijack #4: Social Approval

This is easily one of the most persuasive things a human being can receive. We're all vulnerable to social approval. The need to belong, to be approved or appreciated by our peers is among the highest human motivations. But now our social approval is in the hands of tech companies.

When I get tagged by my friend Marie, I imagine her making a conscious choice to tag me. But I don't see how a company like Facebook orchestrated the whole thing in the first place.

Facebook, Instagram or SnapChat can manipulate how often people get tagged in photos by automatically suggesting all the faces people should tag (e.g. by showing a box with a 1-click confirmation, "Tag Tristan in this photo?").

So when Marie tags me, she's actually responding to Facebook's suggestion, not making an independent choice. But through design choices like this, Facebook controls the multiplier for how often millions of people experience their social approval on the line.

Facebook uses automatic suggestions like this to get people to tag more people, creating more social externalities and interruptions.

The same happens when we change our main profile photo — Facebook knows that's a moment when we're vulnerable to social approval: "what do my friends think of my new pic?" Facebook can rank this higher in the news feed, so it sticks around for longer and more friends will like or comment on it. Each time they like or comment on it, we'll get pulled right back.

Everyone innately responds to social approval, but some demographics (teenagers) are more vulnerable to it than others. That's why it's so important to recognize how powerful designers are when they exploit this vulnerability.

Hijack #5: Social Reciprocity (Tit-for-tat)

- You do me a favor — I owe you one next time.
- You say, "thank you" — I have to say "you're welcome."

- You send me an email— it's rude not to get back to you.
- You follow me — it's rude not to follow you back.

We are vulnerable to needing to reciprocate others' gestures. But as with Social Approval, tech companies now manipulate how often we experience it.

In some cases, it's by accident. Email, texting and messaging apps are social reciprocity factories. But in other cases, companies exploit this vulnerability on purpose.

LinkedIn is the most obvious offender. LinkedIn wants as many people creating social obligations for each other as possible, because each time they reciprocate (by accepting a connection, responding to a message, or endorsing someone back for a skill) they have to come back to linkedin.com where they can get people to spend more time.

Like Facebook, LinkedIn exploits an asymmetry in perception. When you receive an invitation from someone to connect, you imagine that person making a conscious choice to invite you, when in reality, they likely unconsciously responded to LinkedIn's list of suggested contacts. In other words, LinkedIn turns your unconscious impulses (to "add" a person) into new social obligations that millions of people feel obligated to repay. All while they profit from the time people spend doing it.

Imagine millions of people getting interrupted like this throughout their day, running around like chickens with their heads cut off, reciprocating each other — all designed by companies who profit from it…Welcome to social media!

Hijack #6: Bottomless bowls, Infinite Feeds, and Autoplay

Another way to hijack people is to keep them consuming things, even when they aren't hungry anymore.

How? Easy. Take an experience that was bounded and finite, and turn it into a bottomless flow that keeps going.

Cornell professor Brian Wansink demonstrated this in his study showing you can trick people into keep eating soup by giving them a bottomless bowl that automatically refills as they eat. With bottomless bowls, people eat 73% more calories than those with normal bowls and underestimate how many calories they ate by 140 calories.

Tech companies exploit the same principle. News feeds are purposely designed to auto-refill with reasons to keep you scrolling, and purposely eliminate any reason for you to pause, reconsider or leave.

It's also why video and social media sites like Netflix, YouTube or Facebook autoplay the next video after a countdown instead of waiting for you to make a conscious choice (in case you won't). A huge portion of traffic on these websites is driven by autoplaying the next thing.

Tech companies often claim that "we're just making it easier for users to see the video they want to watch" when they are actually serving their business interests.

And you can't blame them, because increasing "time spent" is the currency they compete for.

Hijack #7: Instant Interruption vs. "Respectful" Delivery

Companies know that messages that interrupt people immediately are more persuasive at getting people to respond than messages delivered asynchronously (like email or any deferred inbox).

Given the choice, Facebook Messenger (or WhatsApp, WeChat or SnapChat for that matter) would prefer to design their messaging system to interrupt recipients immediately (and show a chat box) instead of helping users respect each other's attention.

In other words, interruption is good for business. It's also in their interest to heighten the feeling of urgency and social reciprocity.

For example, Facebook automatically tells the sender when you "saw" their message, instead of letting you avoid disclosing whether you read it ("now that you know I've seen the message, I feel even more obligated to respond.") By contrast, Apple more respectfully lets users toggle "Read Receipts" on or off.

The problem is, maximizing interruptions in the name of business creates a tragedy of the commons, ruining global attention spans and causing billions of unnecessary interruptions each day. This is a huge problem we need to fix with shared design standards.

Hijack #8: Bundling Your Reasons with Their Reasons

Another way apps hijack you is by taking your reasons for visiting the app (to perform a task) and make them inseparable from the app's business reasons (maximizing how much we consume once we're there).

For example, in the physical world of grocery stores, the #1 and #2 most popular reasons to visit are pharmacy refills and buying milk. But grocery stores want to maximize how much people buy, so they put the pharmacy and the milk at the back of the store.

In other words, they make the thing customers want (milk, pharmacy) inseparable from what the business wants. If stores were truly organized to support people, they would put the most popular items in the front.

Tech companies design their websites the same way. For example, when you you want to look up a Facebook event happening tonight (your reason) the Facebook app doesn't allow you to access it without first landing on the news feed (their reasons), and that's on purpose.

Facebook wants to convert every reason you have for using Facebook, into their reason which is to maximize the time you spend consuming things.

Hijack #9: Inconvenient Choices

We're told that it's enough for businesses to "make choices available."

- "If you don't like it you can always use a different product."
- "If you don't like it, you can always unsubscribe."
- "If you're addicted to our app, you can always uninstall it from your phone."

Businesses naturally want to make the choices they want you to make easier, and the choices they don't want you to make harder. Magicians do the same thing. You make it easier for a spectator to pick the thing you want them to pick, and harder to pick the thing you don't.

For example, NYTimes.com lets you "make a free choice" to cancel your digital subscription. But instead of just doing it when you hit "Cancel Subscription," they send you an email with

information on how to cancel your account by calling a phone number that's only open at certain times. NYTimes claims it's giving a free choice to cancel your account. Instead of viewing the world in terms of availability of choices, we should view the world in terms of friction required to enact choices — imagine if choices were labeled with how difficult they were to fulfill (like coefficients of friction); would we be making different choices?

Hijack #10: Forecasting Errors, "Foot in the Door" strategies

Facebook promises an easy choice to "See Photo," but would we still click if it gave the true price tag? People don't intuitively forecast the true cost of a click when it's presented to them, and these apps can exploit this tendency.

Sales people use "foot in the door" techniques by asking for a small innocuous request to begin with ("just one click to see which tweet got retweeted") and escalate from there ("why don't you stay awhile?").

Virtually all engagement websites use this trick.

TripAdvisor uses a "foot in the door" technique by asking for a single click review ("How many stars?") while hiding the three page survey of questions behind the click.

SUMMARY AND HOW WE CAN FIX THIS

Are you upset that technology hijacks your agency? I am too, and unfortunately I've only listed a few specific examples — imagine whole bookshelves, seminars, workshops and trainings for aspiring tech entrepreneurs. Or even worse, imagine the thousands of engineers whose job it is every day to invent new ways to keep you hooked.

The ultimate freedom is a free mind, and we need technology that's on our team to help us live, feel, think and act freely. We need our smartphones, notifications screens and web browsers to be exoskeletons for our minds and interpersonal relationships that put our values, not our impulses, first.

People's time is valuable.

WE SHOULD PROTECT IT WITH THE SAME RIGOR AS PRIVACY AND OTHER DIGITAL RIGHTS.

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