

How tech hijacked our brains

There's a reason why so many of us can't put our phones down, says Paul Lewis: the technology is designed to be addictive. Here, he talks to some of the designers who built the "attention economy" – and who now bitterly regret it.

Justin Rosenstein had tweaked his laptop's operating system to block Reddit, banned himself from Snapchat, which he compares to heroin, and imposed limits on his use of Facebook. But even that wasn't enough. In August, the 34-year-old tech executive purchased a new iPhone and instructed his assistant to set up a parental-control feature to prevent him from downloading any apps. He was particularly aware of the allure of Facebook "likes", which he describes as "bright dings of pseudo-pleasure" that can be as hollow as they are seductive. And Rosenstein should know: he was the Facebook engineer who created the "like" button in the first place.

Rosenstein belongs to a small but growing band of Silicon Valley heretics who complain about the rise of the so-called "attention economy": an internet shaped around the demands of an advertising economy. These refuseniks are rarely founders or chief executives, who have little incentive to deviate from the mantra that their companies are making the world a better place. Instead, they tend to have worked a rung or two down the corporate ladder: designers, engineers and product managers who, like Rosenstein, several years ago put in place the building blocks of a digital world from which they are now trying to disentangle themselves. "It is very common," Rosenstein says, "for humans to develop things with the best of intentions, and for them to have unintended, negative consequences." Rosenstein, who now leads a San Francisco-based company that improves office productivity, appears most worried about the psychological effects on people who, research shows, touch, swipe or tap their phone 2,617 times a day. Technology may be contributing towards so-called "continuous partial attention", severely limiting our ability to focus, and possibly lowering IQ. "Everyone is distracted," Rosenstein says. "All of the time."

In 2007, Rosenstein was one of a small group of Facebook employees who decided to create a path of least resistance – a single click – to "send little bits of positivity" across the platform. Facebook's "like" feature was, Rosenstein says, "wildly" successful: engagement soared as people enjoyed the short-term boost they got from giving or receiving social affirmation, while Facebook harvested valuable data about the preferences of users that could be sold to advertisers. The idea was soon copied by Twitter, with its heart-shaped "likes", Instagram, and countless other apps and websites. It was Rosenstein's colleague, Leah Pearlman, then a product manager at Facebook, who announced the feature in a 2009 blogpost. Now 35 and an illustrator,



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turned vocal critic of the tech industry. "All of us are jacked into this system," he says. "All of our minds can be hijacked. Our choices are not as free as we think they are." A graduate of Stanford University, Harris studied under B.J. Fogg, a behavioural psychologist revered in tech circles for mastering the ways technological design can be used to persuade people. Many of his students have gone on to prosperous careers in Silicon Valley. Harris is the student who went rogue.

Attention, to ten close colleagues. It struck a chord, spreading to some 5,000 Google employees, including senior executives who rewarded Harris with an impressive-sounding new job: he was to be Google's in-house design ethicist and product philosopher. Looking back, Harris sees that he was promoted into a marginal role. Still, he adds: "I got to sit in a corner and think and read and understand." He explored how LinkedIn exploits a need for social reciprocity to widen its network; how YouTube and Netflix autoplay videos and next episodes, depriving users of a choice about whether or not they want to keep watching; how Snapchat created its addictive Snapstreaks feature, encouraging near-constant communication between its mostly teenage users. The techniques these companies use are not always generic: they can be algorithmically tailored to each person. An internal Facebook report leaked this year, for example, revealed that the company can identify when teens feel "insecure", "worthless" and "need a confidence boost". Tech companies can exploit such information to keep people hooked; manipulating, for example, when people receive "likes" for their posts, ensuring they arrive when an individual is likely to feel vulnerable, or in need of approval, or maybe just bored. And the very same techniques can be sold to the highest bidder.

Harris believes that tech companies never deliberately set out to make their products addictive. They were responding to the incentives of an advertising economy, experimenting with

Pearlman confirmed via email that she too has grown disaffected with Facebook "likes" and other addictive feedback loops. She has installed a web browser plug-in to eradicate her Facebook news feed, and hired a social media manager to monitor her Facebook page so that she doesn't have to.

If the people who built these technologies are taking such radical steps to wean themselves free, can the rest of us reasonably be expected to exercise our free will? Not according to Tristan Harris, a 33-year-old former Google employee

It all began in 2013, when Harris was working as a product manager at Google and circulated a thought-provoking memo, *A Call To Minimise*

Distraction & Respect Users'

techniques that might capture people's attention. A friend at Facebook told Harris that designers initially decided the notification icon, which alerts people to new activity such as "friend requests" or "likes", should be blue. It fit Facebook's style and, the thinking went, would appear "subtle and innocuous". "But no one used it," Harris says. "Then they switched it to red and of course everyone used it." That red icon is now everywhere. When smartphone users glance at their phones, dozens or hundreds of times a day, they are confronted with small red dots beside their apps, pleading to be tapped. "Red is a trigger colour," says Harris. "That's why it is used as an alarm signal."



Loren Brichter: designed pull-down-to-refresh

The most seductive design, Harris explains, exploits the same psychological susceptibility that makes gambling so compulsive: variable rewards. When we tap those apps with red icons, we don't know whether we'll discover an interesting email, an avalanche of "likes" or nothing at all. It's this that explains how the pull-to-refresh mechanism, whereby users swipe down, pause and wait to see what content appears, rapidly became one of the most addictive design features in modern technology. "Each time you're swiping down, it's like a slot machine," Harris says. "You don't know what's coming next." The designer who created the pull-to-refresh mechanism is Loren Brichter, widely admired in the app-building community for his sleek and intuitive designs. Now 32, Brichter says he never intended the design to be addictive – but would not dispute the slot machine comparison. "I agree 100%," he says. "I have two kids now and I regret every minute that I'm not paying attention to them because my smartphone has sucked me in." Brichter created the feature in 2009 for Tweetie, his startup, mainly because he could not find anywhere to fit the "refresh" button on his app. Twitter acquired Tweetie the following year, integrating pull-to-refresh into its own app. Since then, the design has become one of the most widely emulated features in apps; the downward-pull action is, for millions of people, as intuitive as scratching an itch.

"The average person now touches, swipes or taps their phone 2,617 times a day. Everyone is distracted. All of the time"

Brichter says he is puzzled by the longevity of the feature. In an era of push notification technology, apps can automatically update content without being nudged by the user. "It could easily retire," he says. Instead, it appears to serve a psychological function: after all, slot machines would be far less addictive if gamblers didn't get to pull the lever themselves. Brichter offers another comparison: that it is like the redundant "close door" button in some elevators with automatically closing doors. "People just like to push it." Brichter has put his design work on the backburner while he focuses on building a house in New Jersey. He has blocked certain websites, turned off push notifications, restricted his use of the Telegram app to message only with his wife and two close friends, and tried to wean himself off Twitter. "I still waste time on it," he confesses, "just reading stupid news I already know about."

James Williams is a former Google strategist who built the metrics system for the company's global search advertising business. He has had a front-row view of an industry he describes as the "largest, most standardised and most centralised form of attentional control in human history". Williams, 35, left Google last year, and is on the cusp of completing a PhD at Oxford University exploring the ethics of persuasive design. He says his epiphany came a few years ago, when he noticed he was surrounded by technology that was inhibiting him from concentrating on the things he wanted to focus on. "It was that kind of individual, existential realisation: what's going on?" he says. "Isn't technology supposed to be doing the complete

opposite of this?" That discomfort was compounded when he glanced at one of Google's dashboards, a multicoloured display showing how much of people's attention the company had commandeered for advertisers. "I realised: this is literally a million people that we've sort of nudged or persuaded to do this thing that they weren't going to otherwise do," he recalls. When he saw the Google memo circulated by Harris, the pair became allies, struggling to bring about change from within. Williams and Harris left Google around the same time and co-founded an advocacy group, Time Well Spent, that seeks to build public momentum for a change in the way big tech companies think about design. Williams finds it hard to comprehend why this issue is not "on the front page of every newspaper every day.

"Eighty-seven percent of people wake up and go to sleep with their smartphones," he says. The entire world now has a new prism through which to understand politics, and Williams worries the consequences are profound. The same forces that led tech firms to hook users with design tricks, he says, also encourage those companies to depict the world in a way that makes for compulsive, irresistible viewing. That means privileging what is sensational over what is nuanced, appealing to emotion, anger and outrage. The news media is increasingly working in service to tech companies, Williams adds, and must play by the rules of the attention economy to "sensationalise, bait and entertain in order to survive". In the wake of Donald Trump's stunning electoral victory, many were quick to question the role of so-called "fake news" on Facebook, Russian-created Twitter bots or the data-centric targeting efforts that companies such as Cambridge Analytica used to sway voters. But Williams sees those factors as symptoms of a deeper problem. It is not just shady or bad actors who were exploiting the internet to change public opinion. The attention economy itself is set up to promote a phenomenon like Trump, who is masterly at grabbing and retaining the attention of supporters and critics alike, often by exploiting or creating outrage.

Williams saw a similar dynamic unfold months earlier, during

the Brexit campaign, when the attention economy appeared to him biased in favour of the emotional, identity-based case for the UK leaving the European Union. He stresses these dynamics are by no means isolated to the political Right: they also play a role, he believes, in the unexpected popularity of left-wing politicians such as Bernie Sanders and Jeremy Corbyn, and the frequent outbreaks of internet outrage over issues that ignite fury among progressives. All of which, Williams says, is not only distorting the way we view politics but, over time, may be changing the way we think, making us less rational and more impulsive. "We've habituated ourselves into a perpetual cognitive style of outrage, by internalising the dynamics of the medium," he says.

Since the US election, Williams has explored another dimension to today's brave new world. If the attention economy erodes our ability to remember, to reason, to make decisions for ourselves – faculties that are essential to self-governance – what hope is there for democracy itself? If Apple, Facebook, Google, Twitter, Instagram and Snapchat are gradually chipping away at our ability to control our own minds, could there come a point, I ask, at which democracy no longer functions? "Will we be able to recognise it, if and when it happens?" Williams replies. "And if we can't, then how do we know it hasn't happened already?"

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