

The worst thing I read this year, and what it taught me... or Can we design sociotechnical systems that don't suck

I found Shane Snow's essay on prison reform—["How Soylent and Oculus Could Fix the Prison System"](#)—through hatelinking. Friends of mine hated the piece so much that normally articulate people were at a loss for words.

With a recommendation like that, how could I pass it up? And after reading it, I tweeted my astonishment to Susie, who told me, "I write comics, but I don't know how to react to this in a way that's funny." I realized that I couldn't offer an appropriate reaction in 140 characters either. The more I think about Snow's essay, the more it looks like the outline for a class on the pitfalls of solving social problems with technology, a class I'm now planning on teaching this coming fall.

Using Snow's essay as a jumping off point, I want to consider a problem that's been on my mind a great deal since joining the [MIT Media Lab](#) five years ago: how do we help smart, well-meaning people address social problems in ways that make the world better, not worse? In other words, is it possible to get beyond both a naïve belief that the latest technology will solve social problems and a reaction that rubbishes any attempt to offer novel technical solutions as inappropriate, insensitive and misguided? Can we find a synthesis in which technologists look at their work critically and work closely with the people they're trying to help in order to build sociotechnical systems that address hard problems?

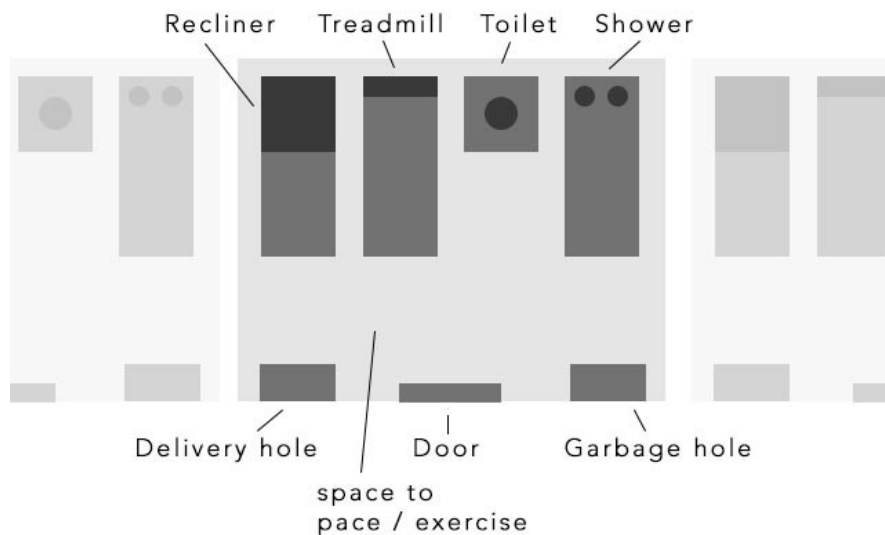
Obviously, I think this is possible—if really, really hard—or I wouldn't be teaching at an engineering school. But before considering how we overcome a naïve faith in technology, let's examine Snow's suggestion a textbook example of a solution that's technically sophisticated, simple to understand and dangerously wrong.

When smart people get important things really wrong

Though he may be best known as co-founder of content marketing platform ["Contently"](#), [Shane Snow](#) describes himself as "journalist, geek and best-selling author". That last bit comes from his book ["Smartcuts: How Hackers, Innovators, and Icons Accelerate Success"](#), which offers insights on how "innovators and icons" can "rethink convention" and break "rules that are not rules". That background may help readers understand where Snow is coming from. His blog is filled with [plainspoken and often entertaining explanations of complex systems](#) followed by apparently straightforward conclusions—evidently, burning coal and natural gas to generate electricity is a poor idea, so oil companies should be investing in solar energy. Fair enough.

Some of these explorations are more successful than others. In Snow's essay about prison reform, he identifies violence, and particularly prison rape, as the key problem to be solved, and offers a remedy that he believes will lead to cost savings for taxpayers as well: all prisoners should be incarcerated in solitary confinement, fed only [Soylent meal replacement drink](#) through slots in the wall, and all interpersonal interaction and rehabilitative services will be provided in [Second Life](#) using the [Oculus Rift](#) VR system. Snow's system eliminates many features of prison life—"cell blocks, prison yards, prison gyms, physical interactions with other prisoners, and so on." That's by design, he explains. "Those are all current conventions in prisons, but history is clear: innovation happens when we rethink conventions and apply alternative learning or technology to old problems."

An early clue that Snow's rethinking is problematic is that his proposed solution looks a lot like ["administrative segregation"](#), a technique used in prisons to separate prisoners who might be violent or disruptive from the general population by keeping them in solitary confinement 23 hours a day. The main problem with administrative segregation or with [the SHU \(the "secure housing unit" used in supermax prisons\)](#) is that inmates tend to experience serious mental health problems connected to sustained isolation. "Deprived of normal human interaction, many segregated prisoners reportedly suffer from mental health problems including anxiety, panic, insomnia, paranoia, aggression and depression," [explains social psychologist Dr. Craig Haney](#). Shaka Senghor, a writer and activist who was formerly incarcerated for murder, explains that many inmates in solitary confinement have underlying mental health issues, and the isolation damages even the sound of mind. Solitary confinement, he says, is ["one of the most barbaric and inhumane aspects of our society."](#)



Due to the psychological effects of being held in isolation, [the UN Special Rapporteur on Torture has condemned the use of sustained solitary confinement](#) and called for a ban on solitary confinement for people under 18 years old. Rafael Sperry of Architects/Designers/Planners for Social Responsibility has [called for architects to stop designing prisons that support solitary confinement](#) as they enable violations of human rights. Snow's solution may be innovative, but it's also a large-scale human rights violation.

Snow and supporters might argue that he's not trying to deprive prisoners of human contact, but give them a new, safer form of contact. But there's virtually no research on the health effects of sustained exposure to head-mounted virtual reality. Would prisoners be forced to choose between [simulator sickness or isolation?](#) What are the [long-term effects on vision](#) of immersive VR displays? Will prisoners experience visual exhaustion through [vergence-accommodation](#), a yet-to-be-solved problem of eye and brain strain due to problems focusing on objects that are very nearby but appear to be distant? Furthermore, will contact with humans through virtual worlds mitigate the mental problems prisoners face in isolation or exacerbate them? How do we answer any of these questions ethically, given [the restrictions we've put on experimenting on prisoners](#) in the wake of Nazi abuse of concentration camp prisoners.

How does an apparently intelligent person end up suggesting a solution that might, at

best, constitute unethical medical experiments on prisoners? How does a well-meaning person suggest a remedy that likely constitutes torture?

Make sure you're solving the right problem.

The day I read Snow's essay, I happened to be leading a workshop on social change during the [Yale Civic Leadership conference](#). Some of the students I worked with were part of the [movement to rename Yale's Calhoun College, and all were smart, thoughtful, creative and openminded](#).

The workshop I led encourages thinkers to consider different ways they might make social change, not just through electing good leaders and passing just laws. [Our lab](#) examines the idea that [changemakers can use different levers of change, including social norms, market forces, and new technologies to influence society](#), and the workshop I led asks students to propose novel solutions to long-standing problems featuring one of these levers of change. With Snow's essay in mind, I asked the students to take on the challenge of prison reform.

Oddly, none of their solutions involved virtual reality isolation cells. In fact, most of the solutions they proposed had nothing to do with prisons themselves. Instead, their solutions focused on over-policing of black neighborhoods, America's aggressive prosecutorial culture that encourages those arrested to plead guilty, legalization of some or all drugs, reform of sentencing guidelines for drug crimes, reforming parole and probation to reduce reincarceration for technical offenses, and building robust re-entry programs to help ex-cons find support, housing and gainful employment.

In other words, when Snow focuses on making prison safer and cheaper, he's working on the wrong problem. Yes, prisons in the US could be safer and cheaper. But the larger problem is that the US incarcerates more people than any other nation on earth—with 5% of the world's population, we are responsible for 25% of the world's prisoners. Snow may see his ideas as radical and transformative, but they're fundamentally conservative—he tinkers with the conditions of confinement without questioning whether incarceration is how our society should solve problems of crime and addiction. As a result, his solutions can only address a facet of the problem, not the deep structural issues that lead to the problem in the first place.

Many hard problems require you to step back and consider whether you're solving the right problem. If your solution only mitigates the symptoms of a deeper problem, you may be calcifying that problem and making it harder to change. Cheaper, safer prisons make it easier to incarcerate more Americans and avoid addressing fundamental problems of addiction, joblessness, mental illness and structural racism.

Understand that technology is a tool, and not the only tool.

Some of my hate-linking friends began their eye-rolling about Snow's article with the title, which references two of Silicon Valley's most hyped technologies. With the current focus on the US as an "innovation economy", it's common to read essays predicting the end of a major social problem due to a technical innovation. [Bitcoin will end poverty in the developing world by enabling inexpensive money transfers](#). Wikipedia and One Laptop Per Child will educate the world's poor without need for teachers or schools. [Self driving cars will obviate public transport](#) and reshape American cities.

Evgeny Morozov has offered a sharp and helpful critique to this mode of thinking, which he calls "solutionism". Solutionism demands that we focus on problems that have ["nice and clean technological solution at our disposal."](#) In his book, ["To Save Everything, Click Here"](#), Morozov savages ideas like Snow's, whether they are meant as thought experiments or serious policy proposals. (Indeed, one worry I have in writing this essay is taking Snow's ideas too seriously, as Morozov does with many of the ideas he lambastes in his book.)

The problem with the solutionist critique is that it tends to remove technological innovation from the problem-solver's toolkit. In fact, technological development is often a key component in solving complex social and political problems, and new technologies can sometimes open a previously intractable problem. The rise of inexpensive solar panels may be an opportunity to move nations away from a dependency on fossil fuels and begin lowering atmospheric levels of carbon dioxide, much as developments in natural gas extraction and transport technologies have lessened the use of dirtier fuels like coal.

But it's rare that technology provides a robust solution to a social problem by itself. Successful technological approaches to solving social problems usually require changes in laws and norms, as well as market incentives to make change at scale. [I installed solar panels on the roof of my house last fall](#). Rapid advances in panel technology made this a routine investment instead of a luxury, and the existence of competitive solar installers in our area meant that market pressures kept costs low. But the panels were ultimately affordable because federal and state legislation offered tax rebates for their purchase, and because Massachusetts state law rewards me with solar credits for each megawatt I produce, which I can sell to utilities through an online marketplace, because they are legally mandated to produce a percentage of their total power output via solar generation. And while there are powerful technological, market and legal forces pushing us towards solar energy, the most powerful may be the social, normative pressure of seeing our neighbors install solar panels, leaving us feeling like we weren't doing our part.

My Yale students who tried to use technology as their primary lever for reforming US

prisons had a difficult time. One team offered the idea of an online social network that would help recently released prisoners connect with other ex-offenders to find support, advice and job opportunities in the outside world. Another looked at the success of [Bard College's remarkable program to help inmates earn BA degrees](#) and wondered whether online learning technologies could allow similar efforts to reach thousands more prisoners. But many of the other promising ideas that arose in our workshops had a technological component—given the ubiquity of mobile phones, why can't ex-offenders have their primary contact with their parole officers via mobile phones? Given the rise of big data techniques used for "smart policing", can we review patterns of policing, identifying and eliminating cases where officers are overfocusing on some communities?

The temptation of technology is that it promises fast and neat solutions to social problems, but usually fails to deliver. The problem with Morozov's critique is that technological solutions, combined with other paths to change, can sometimes turn intractable problems into solvable ones. The key is to understand technology's role as a lever of change in conjunction with complementary levers.

Don't assume your preferences are universal

Shane Snow introduces his essay on prison reform not with statistics about the ineffectiveness of incarceration in reducing crime, but with his fear of being sent to prison. Specifically, he fears prison rape, a serious problem which he radically overestimates: "My fear of prison also stems from the fact that some 21 percent of U.S. prison inmates get raped or coerced into giving sexual favors to terrifying dudes named Igor." Snow is religious about footnoting his essays, but not as good at reading the sources he cites—the report he uses to justify his fear of "Igor" (parenthetical comment removed—EZ, 6/29/16) indicates that [2.91 of 1000 incarcerated persons experienced sexual violence, or 0.291%, not 21%](#). *Shane has amended his post, and references another study that indicates a higher level of coerced sexual contact in prison.*



Perhaps isolation for years at a time, living vicariously through a VR headset while sipping an oat flour smoothie would be preferable to time in the prison yard, mess hall, workshop or classroom for Snow. But there's no indication that Snow has talked to any current or ex-offenders about their time in prison, and about the ways in which encounters with other prisoners led them to faith, to mentorship or to personal transformation. The people Shane imagines are so scary, so **other**, that he can't imagine interacting with them, learning from them, or anything but being violently assaulted by them. No wonder he doesn't bother to ask what aspects of prison life are most and least livable, which would benefit most from transformation.

Much of my work focuses on how technologies spread across national, religious and cultural borders, and how they are transformed by that spread. Cellphone networks believed that pre-paid scratch cards were an efficient way to sell phone minutes at low cost—until Ugandans started using the scratch off codes to send money via text message in a system called Sente, inventing practical mobile money in the process. Facebook believes its service is best used by real individuals using their real names, and goes to great lengths to remove accounts it believes to be fictional. But when Facebook comes to a country like Myanmar, where it is seen as a news service, not a social networking service, [phone shops specializing in setting up accounts using fake](#)

[names and phone numbers render Facebook's preferences null and void.](#)

Smart technologists and designers have learned that their preferences are seldom their users' preferences, and companies like Intel now employ [brilliant ethnographers](#) to discover how tools are used by actual users in their homes and offices. Understanding the wants and needs of users is important when you're designing technologies for people much like yourself, but it's utterly critical when designing for people with different backgrounds, experiences, wants and needs. Given that Snow's understanding of prison life seems to come solely from binge-watching Oz, it's virtually guaranteed that his proposed solution will fail in unanticipated ways when used by real people.

Am I the right person to solve this problem?

Of the many wise things my Yale students said during our workshop was a student who wondered if he should be participating at all. "I don't know anything about prisons, I don't have family in prison. I don't know if I understand these problems well enough to solve them, and I don't know if these problems are mine to solve."

Talking about the workshop with my friend and colleague [Chelsea Barabas](#), she asked the wonderfully deep question, "Is it ever okay to solve another person's problem?"

On its surface, the question looks easy to answer. We can't ask infants to solve problems of infant mortality, and by extension, it seems unwise to let kindergarden students design educational policy or demand that the severely disabled design their own assistive technologies.

But the argument is more complicated when you consider it more closely. It's difficult if not impossible to design a great assistive technology without working closely, iteratively and cooperatively with the person who will wear or use it. My colleague [Hugh Herr](#) designs cutting-edge prostheses for US veterans who've lost legs, and the centerpiece of his lab is a treadmill where amputees test his limbs, giving him and his students feedback about what works, what doesn't and what needs to change. Without the active collaboration of the people he's trying to help, he's unable to make technological advances.

Disability rights activists have demanded "nothing about us without us", a slogan that demands that policies should not be developed without the participation of those intended to benefit from those policies. Design philosophies like participatory design and codesign bring this concept to the world of technology, demanding that technologies designed for a group of people be designed and built, in part, by those people. [Codesign](#) challenges many of the assumptions of engineering, requiring people who are used to working in isolation to build broad teams and to understand

that those most qualified to offer a technical solution may be least qualified to identify a need or articulate a design problem. Codesign is hard and frustrating, but it's also one of the best ways to ensure that you're solving the right problem, rather than imposing your preferred solution on a situation.

On the other pole from codesign is an approach to engineering we might understand as "Make things better by making better things". This school of thought argues that while mobile phones were designed for rich westerners, not for users in developing nations, they've become one of the transformative technologies for the developing world. Frustratingly, this argument is valid, too. Many of the technologies we benefit from weren't designed for their ultimate beneficiaries, but were simply designed well and adopted widely. Shane Snow's proposal is built in part on this perspective—Soylent was designed for geeks who wanted to skip meals, not for prisoners in solitary confinement, but perhaps it might be preferable to [Nutraloaf](#) or other horrors of the prison kitchen.

I'm not sure how we resolve the dichotomy of "with us" versus "better things". I'd note that every engineer I've ever met believes what she's building is a better thing. As a result, strategies that depend on finding the optimum solutions often rely on choice-rich markets where users can gravitate towards the best solution. In other words, they don't work very well in an environment like prison, where prisoners are unlikely to be given a choice between Snow's isolation cells and the prison as it currently stands, and are even less likely to participate in designing a better prison.

Am I advocating codesign of prisons with the currently incarcerated? Hell yeah, I am. And with ex-offenders, corrections officers, families of prisoners as well as the experts who design these facilities today. They're likely to do a better job than smart Yale students, or technology commentators.

The possible utility of beating a dead horse

It is unlikely that anyone is going to invite Shane Snow to redesign a major prison any time soon, so spending more than three thousand words urging you to reject his solution may be a waste of your time and mine. But the mistakes Shane makes are those that engineers make all the time when they turn their energy and creativity to solving pressing and persistent social problems. Looking closely at how Snow's solutions fall short offers some hope for building better, fairer and saner solutions.

The challenge, unfortunately, is not in offering a critique of how solutions go wrong. Excellent versions of that critique exist, from Morozov's war on solutionism, to Courtney Martin's brilliant "[The Reductive Seduction of Other People's Problems](#)". If it's easy to design inappropriate solutions about problems you don't fully understand,

it's not much harder to criticize the inadequacy of those solutions.

What's hard is synthesis—learning to use technology as part of well-designed sociotechnical solutions. These solutions sometimes require profound advances in technology. But they virtually always require people to build complex, multifunctional teams that work with and learn from the people the technology is supposed to benefit.

Three students at the MIT Media Lab taught a course last semester called "Unpacking Impact: Reflecting as We Make". [They point out](#) that the Media Lab prides itself on teaching students how to make anything, and how to turn what you make into a business, but rarely teaches reflection about what we make and what it might mean for society as a whole. My experience with teaching this reflective process to engineers is that it's both important and potentially paralyzing, that once we understand the incompleteness of technology as a path for solving problems and the ways technological solutions relate to social, market and legal forces, it can be hard to build anything at all.

I'm going to teach a new course this fall, tentatively titled "Technology and Social Change". It's going to include an examination of the [four levers of social change](#) Larry Lessig suggests in Code and which I've been exploring as possible paths to civic engagement. It will include deep methodological dives into codesign, and into using anthropology as tool for understanding user needs. It will look at unintended consequences, cases where technology's best intentions fail, and cases where careful exploration and preparation led to technosocial systems that make users and communities more powerful than they were before.

I'm "calling my shot" here for two reasons. One, by announcing it publicly, I'm less likely to back out of it, and given how hard these problems are, backing out is a real possibility. And two, if you've read this far in this post, you've likely thought about this issue and have suggestions for what we should read and what exercises we should try in the course of the class—I hope you might be kind enough to share those with me.

In the end, I'm grateful for Shane Snow's surreal, [Black Mirror vision of the future](#) prison both because it's a helpful jumping off point for understanding how hard it is to make change well using technology, and because the US prison system is a broken and dysfunctional system in need of change. But we need to find ways to disrupt better, to challenge knowledgeably, to bring the people they hope to benefit into the process. If you can, please help me figure out how we teach these ideas to the smart, creative people I work with who want to change the world and are afraid of breaking it in the process.

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