Legacy Switches

1. U Georgia Faculty Workshop

1.1. Introduction (20-25 minutes)

1.1.1. Introduction

- This paper is the product of a collaboration with a current Georgetown student.
  - I developed the core idea about five or six years ago and delivered a talk about it to the ABA Section on Science and Technology about three years ago. It sat on my hard drive ever since.
    - Someone once said to me, don't let a prep go to waste!
  - I met a student who had published some pretty interesting research on the Internet of Things and security risks while getting an earlier degree at the Harvard Kennedy School, so I proposed that we expand my speech into a Law Review article.
- For me, it's an atypical law review article.
  - Theory: 5% / Harm: 20% / Prescription: 75%
  - It's a small paper that's trying to serve a broader purpose:
    - 1. A launching pad for big ideas in the next phase of my research agenda:
      - Design
      - Friction
      - Surveillance Capitalism as a motivator
    - 2. A prescription that at first glace seems sort of innocuous but upon reflection one realizes it will require the implementers to take on some sacred cows that deserve to be slaughered along the way:
      - "Efficiency"
      - Antitrust as the savior.
      - Get the CPSC to come out of its shell

1.1.2. Overall Motivation

- Use the Nest as the animating example (visual display)
  - Fridge is too easy!

    - Smart speaker is too hard.
    - Nest feels like a sweet spot.
- Characteristics of the Nest that intrigue me
    - Look at the thing it replaces!
        - The ugliest thing attached to your house.
        - But something that tends to last 35 years according to research.
        - I've owned many that have been older.
    - The dubious benefits of the smart version.
        - I've never understood the premium placed on what seems of dubious benefit.
            - It looks great!
            - It is probably better at regulating temperature, so maybe it's an environmental win, complicating our claim that it is a enviornmental win.
    - More complex privacy/security story, because its sensors are a bit limited (no camera, probably no microphone).
- But for me the kicker: what happens to Nest in 10 years? 20? 30?
    - When will Google declare them EOL?
    - If anybody has the resources to support these for 30 years, it's Google. But will they?
    - It's not conceivable that Nest thermostats will be secure in a decade. Absolutely impossible.
        - That's objectively not worth any benefit or glossy upside.
        - To my engineer's brain, that makes this a no-brainer problem in need of a solution, so we might as well start to fix it now!

1.1.3. Part I: IoT and Consumer Harm

- Although this is a prescriptions paper, I had to motivate it by surveying the harms and the risks of those harms.

1. Two timeframes for these harms:

- Harms that occur the day you plug in the device (surveillance capitalism)
- Harms that occur long after the smart features have stopped feeling important to you, but you still need a thermostat, especially security harms.
- Let me say a bit more about both kinds.

2. Privacy and "Surveillance Capitalism"
   - Been writing about privacy for more than 15 years.
   - Since the start: intense focus on **privacy harm**
     - Maybe the majority of what has been written!
     - Especially: how some new technology gathers or uses data in ways that put individuals and groups at new and underappreciated forms of risk.
   - So, for example:
     - Dan Solove and "digital dossiers"
     - Neil Richards and "intellectual privacy"
     - Danielle Citron and "sexual privacy"
     - Increasingly not just privacy–machine learning and bias, social networks and misinformation
   - Much more recently, gifted two books that focus on privacy as a systemic, structural problem.
   - Let's focus on the way we write and talk about the goals of privacy.
   - Why does privacy matter? What is privacy for?
   - Or to state that in the negative, what kind of harms is privacy–and privacy law–meant to protect us against?
     - Shoshanna Zuboff: Surveillance Capitalism
     - Julie Cohen: Information Capitalism or the Biopolitical domain
     - In common:
       - Focus on new business models made possibly by the surveillance and data transfer possibilities of smartphones, sensors, and the Internet.
     - Slightly different focus:
       - Zuboff: The privacy and autonomy implications. The manipulation.

        - Cohen: The subtle reordering of important governance institutions, especially law.

3. Security
    - We started with much more emphasis on this.
    - This is why we've focused on hard-wired devices and appliances that replace previously long-lived home fixtures.
    - Quick hit on the Mirai botnet
        - Early Fall 2016
        - At its peak, the virus had found its way onto more than 600,000 IoT devices!
            - Most home routers and connected cameras
        - It was a giant DDoS machine
            - Each phones home to a command-and-control channel.
            - Those with access can direct this massive cannon at a particular IP address
            - The devices try to use all of their bandwidth to direct requests at the address, knocking it off the Internet.
        - Main targets:
            - Krebs on Security
                - Lost his CDN provider–good way to censor people!
            - OVH: One of Europe's largest hosting providers.
                - World's first recorded cumultative 1 TBps attacks!
            - October 21, 2016: Targeted DNS provider Dyn, taking down: Twitter, Netflix, Paypal, and Reddit.
        - Main motivation?
            - Apparently: rival minecraft gangs trying to disable competitive servers!!!
    - Bottom line: Millions of poorly designed, quickly end-of-lifed devices will continue to be a problem.

        - One expert: "The prevalence of insecure IoT devices on the Internet makes it very likely that, **for the foreseeable future, they will be the main source of DDOS attacks.**"
4. Say less about the other two:
    - Environment
    - Platform Power and Competition
    - Are we giving these short-shrift?

1.1.4. Part II: The Proposal

1. Core idea
    - Design-based intervention
    - Every Smarthome device should come with a switch that, when flipped, will disable the features that contribute to the kinds of harms I describe.
        - Probably mandated by statute and regulation.
2. Focus in particular on Design and Friction
    - Maybe start with the final paragraph of the entire paper:
        - Finally, creating and administering a legacy switch requirement will help legislatures and government agencies embrace a different, more involved, and more proactive approach to governing technology companies than they have adopted in the past. They need more often to see themselves as co-designers, along with the tech companies, of the devices and services that both enrich our lives and create new risks of harm. A society in which “they design, we react” has led to social networks full of misinformation, toxic services full of misogyny and hate, generations of people addicted to their smartphones, and cratering democratic institutions. Our thirty-year experiment in letting Silicon Valley design alone has failed, and we need to reconceptualize who gets to participate in design.
    - Participatory Design
        - What it means.
    - "Friction"

        - Desirable inefficiency.
    - Design Thinking vs. Friction
        - I'm not sure which is really my central focus.
        - Or which precedes the other if I want to write more about this.
        - Or if I devote most of the rest of my sabbatical energy to one or the other, which one would I highlight?

1.1.5. Part III: Implementation

- As I said, this is a paper that revels in the implementation nitty gritty
    - I won't replay every last bit about bluetooth range and self-destructing microchips, but I'm happy to talk through the details during Q&A.
- This detail isn't only about trying to get this implemented!
    - There are a lot of broader themes I am trying to evoke and
    - future research paths I'm trying to launch

1. Activating the Consumer Product Safety Commission
    - The subtext is that this is an agency with a fairly expansive remit, set of tools, and positive, depoliticized reputation.
        - It hasn't received much attention from technology law scholars.
        - We'd like to test the waters–to give a small nudge from the academy, to seek out the bureaucrats inside the agency who have been (likely) pushing this agenda.
        - Result:
            - We're not too aggressive.
            - We're not too commital about what they can or cannot do.
    - I'm writing this for some unnamed mid-level CPSC staffer with high ambitions!
2. It's not the destination; it's the journey!
    - A provocation: A government-mandated legacy switch that almost nobody ever uses is still a success in my book:
        - The regulatory scrutiny, participatory design, and deployment of friction

alone will require:

- (a) getting the political will mustered to have it flipped; and
- (b) redesigning everything to implement it

- Will redound to our benefit, even if it's not used much.

- Overall, I Just think we need to involve the public more in design. Hence the last sentences.
- The paragraph of the draft:
  - Even if very few people end up using a legacy switch, the very process that leads to their adoption would itself be a significant benefit, one that might outweigh the costs.
  - Say a company implements a legacy switch only because a new regulation requires it, rather than because of an independent assessment of market demand or social responsibility.
  - The process that created such a regulation will result only after political pressure, civil society advocacy, and public debate.
  - There is value in rallying and organizing the kind of participatory design forces we called for above.
  - We need companies to increasingly envision design as a transparent process involving outside voices and influences more often than they have in the past.
  - Every company that implements a legacy switch against its internal wishes is evidence of a productive opening of the broken insularity of modern technological design.

3. What is a Thermostat?
   - An example of "it's not the destination" at work:
     - Any law mandating a legacy switch must address a difficult, ontological, and almost metaphysical question: what exactly is a smart device?
   - What must happen when a consumer flips a legacy switch? This reads like a postmodern riddle: what is the essence of a thermostat?

        - For a thermostat
            - We claim it's easy: maintain a set temperature.
            - But this elides some complexity:
                - Schedules?
                - Detecting when people are out?
                - Historical logging and reporting?
    - We punt a bit and focus on process over substance–don't prescribe this by statute.
        - Let the CPSC or FTC promulgate a rule.
    - Much more difficult:
        - Smart security system–must it be able to call the police?
        - Home assistants–smart speakers

1.1.6. Old stuff no longer used

1. Might LS make devices less secure and less reliable?
    - Much more on Internet kill switches
        - This is what Hartzog and Hoofnagle/Kesari/Perzanowski focused on.
            - Both groups citing Schneier.
2. The argument for physical switches
    - Really honing in on the "who gets to design" question.
    - **Physical switches are very easy to use.** They afford a visible, binary setting—on or off.
        - We first encounter physical switches early in childhood and interact with them every day of our lives.
        - They require less accurate motor skills and eyesight than swiping on a tiny device screen, and they require less technical know-how than installing and interacting with an app on a smartphone.
    - **Physical switches reduce the attack surface.** Malevolent hackers, disgruntled ex-partners, and government officials will not be able to flip a physical switch remotely.
    - **Physical switches foster ease-of-use** by working regardless of authorization,

access rights, or passwords.

1. Part 3: simple, visual
    - Avoiding dark patterns
2. Part 4: modular
    - Treating the "Interface" as a point of transparency and regulatory control.
3. Part 4: "rough"
    - Full disclosure: all me. I'll let Nate speak for himself.
    - "Legacy switches might become little blemishes on the otherwise smooth uniformity that marks the prevailing aesthetic ideal of our day."
    - Bridges to "The Maintainers" and the Right to Repair movement.

Author: Paul Ohm

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