GAA Homes and America's Digital Caste System

Mid-future catastrophic scenario

In the year 2035, Apple households tend to be wealthier and older. They can afford Apple's sleek, beautiful hardware products available in one of three colors: palladium silvery-white, osmium gray, or dark onyx. Apple's smart glasses, smart toilets, and custom refrigerators carry on its long tradition of pricey products anyone can use right out of the box. Its system comes with spoken interfaces and a choice of two soothing voices, Joost (who has a "unisex higher tone") or Deva (who has a "unisex lower tone"). But convenience comes with a cost. Apple's artificial intelligence (AI) cannot be overwritten. In an Apple home running the air conditioner, you can't open the door for more than a minute or the system will start beeping incessantly. If there's sufficient daylight detected by the sensors in your light bulbs, the Apple system keeps the light switch on lockdown.

We saw a preview of Google's connected home decades ago at the 2018 South By Southwest Festival in Austin, Texas. Back then, the tagline was "Make Google do it," and attractive spokesmodels took small groups around the three-story home to interact with AI-powered appliance screens and connected frozen daiquiri makers. Google's system is less intuitive, but it makes better use of our data—and it offers different levels of service and access. For those who can afford the upgrade fees and have enough tech savvy, Google Green gives families the ability to manually unlock their systems, and they can connect a greater variety of things—such as coffee makers and outdoor irrigation systems—to their homes. Green families can also opt out of being served advertisements, though their data is still collected and sent to third parties. Google Blue is an affordable option with limited unlocking privileges and some additional permissions—and plenty of ads. Google Yellow is the lowest tier. It's free but comes with no override abilities, a small selection of available devices and appliances, and offers limited data protections.

Amazon went in an interesting, but ultimately smarter, direction. A few announcements Amazon made in the fall of 2018 went largely unnoticed, like the launch of its AmazonBasics microwave, which includes a voice interface. Users could put a bag of popcorn in the microwave and ask Alexa to pop it. Tech journalists wrote the microwave off as a novel, silly use for Alexa, and missed the bigger picture: The system was actually designed to get us hooked on subscription popcorn. That's because the microwave tracks both what we're heating up and what we're ordering on the Amazon platform. A new box arrives before you ever have the chance to run out.

Because Amazon was the smartest in its approach with federal, state, and local governments—offering them deep discounts at Amazon.com, patiently working through procurement requirements, and building and maintaining cloud services specifically for them—it became the preferred platform for certain social services in the United States. That is how Amazon discovered how to leverage the long tail of government funding.

Low-income families now live in Amazon Housing, which has replaced city-funded public housing programs in the United States. By every measure, they are far superior to any public housing ever provided through our previous government programs. Amazon Homes are outfitted with connected devices in every room. The former Supplemental Nutrition Assistance Program (previously known as the Food Stamp Program) is currently hosted by Amazon, which provides steeply discounted Amazon-branded household products, food and drink, toiletries, and books. Unsurprisingly, this program works seamlessly. There are never delays in funds being distributed, it's easy to look up the status of an account, and all transactions can be completed without ever having to wait in a long line at a government office. Those living in Amazon Homes must buy most of their things through Amazon while their data is scraped, productized, and monetized for various initiatives. Amazon's AIs are the most pervasive, following Amazon families everywhere they go to collect valuable behavioral data.

The lack of interoperability between AI frameworks and systems led to segregation by our data and household, and that is why we now

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have a digital caste system. By choosing Google, Apple, or Amazon, you are forced to align your family values with the values of the corporation. Apple families are rich, maybe a little less AI-savvy, and live in fancy houses. Google families might be rich and techy, or middle class and fine with marketing, or complacent with not having a lot of choices in life. There is no way to sugarcoat Amazon families: They're poor, even if they have free access to cool gadgets.

Families are locked into their de-facto home operating systems, and that designation travels with them. It's easier for a Google Yellow family to port into the Blue or even Green level than it is for an Amazon family to port into the Apple system. That's why most families opted in to Google when they had the opportunity. Your status is visible to all of the AIs you interact with. Self-driving taxi services like Lyft, Uber, and CitiCar don't pick up Amazon riders with as much frequency, and cars sent to them tend not to be as nice. Waymo cars exclusively pick up Googlers. For Greens, the car is preset to the rider's desired temperature and ambient lighting scheme, and it drives along the rider's preferred routes. Yellows are subjected to advertising their entire trip.

Advertising isn't the only headache for Yellow Googlers. One downside to all the subsidized (or free) gadgets, appliances, and gear offered to Google Blue, Google Yellow, and Amazon families is that it's impossible to disconnect the AI health and wellness minders, which continually monitor, diagnose, and nudge. A failure to comply with health and wellness minders results in a litany of consequences.

Remember those Amazon Lockers you used many years ago to pick up all the things you ordered on the Amazon app and Amazon.com? They made their way into Amazon Housing. Leaders in the U.S. Health and Human Services Department thought nudging poor people was a clever way to improve health and wellness, so the department issued new policies requiring all public housing customers to be outfitted with Locker technology. The Lockers may look like ordinary pantries, refrigerator doors, and closets, but they act like AI-powered juries. If an Amazon Housing customer hasn't had her exercise that day, the Locker system will decide to keep the freezer closed and won't let her eat ice cream.

It's not impossible to intermarry—occasionally an Amazon will marry into an Apple family—but that old adage "opposites attract" no longer applies. All of our AI-powered dating services now match us based on our data. On the one hand, we no longer suffer under the tyranny of choice since dating AIs have drastically reduced the selection of possible suitors. Yet some choices that once made us uniquely human—like May-December romances or dating someone our parents don't approve of—are less available to us now. In America, society is beginning to feel uncomfortably Huxleian, as we acquiesce, get married, and have babies with our fellow Apples, or Google Blues, or Amazons.

1ST YEAR ON THE LIST

Disinfecting Bots

Virus-zapping CLOi robot is the first of a number of autonomous droids LG plans to market in the United States in 2021.

KEY INSIGHT

The pandemic resulted in an explosion of COVID-19 tech: devices and gadgets intended to help people mitigate the harms of the virus. Robots capable of sterilization and disinfecting, once used only in hospitals, are making their way into our offices and homes.

EXAMPLES

The CLOi autonomous robot from LG Electronics looks like a narrow space heater on wheels. It uses ultraviolet light to disinfect high-touch, high-traffic areas in retail, hospitality, and corporate settings. There are three types of UV radiation (UVA, UVB, and UVC), and LG will use UVC, which is approved by the U.S. Food and Drug Administration for disinfecting nonporous surfaces, water, and air. Signify, which makes LED lighting systems, developed a desk lamp that disinfects nearby surfaces when turned on. Xenex Disinfection Services makes robots that attack deadly pathogens with pulsing, high-energy, broad-spectrum UV light.

DISRUPTIVE IMPACT

While some hospitals and office buildings experimented with disinfecting robots pre-Covid, they hit the mainstream amid continued lockdowns and fears about the spreading virus. Demand for UV robots is growing in schools, health care facilities, offices, and industrial settings, especially as prices fall. Sales of disinfecting robots may hit $2.3 billion by 2025, up from $341 million in 2019, according to market advisory firm Mordor Intelligence.

EMERGING PLAYERS

- LG Electronics
- Xenex
- Prescientx
- UBTech Robotics
- MIT Computer Science & Artificial Intelligence Lab

2ND YEAR ON THE LIST

Digital Emissions

Data centers are responsible for CO2 emissions.

KEY INSIGHT

Collectively, our homes are starting to produce digital emissions. Everything we do online—sending an email, hosting a Zoom call—requires energy, and each of those digital actions leads to carbon dioxide emissions.

EXAMPLES

The internet's data is invisible, but it requires physical data centers around the world that must be powered on, cooled, and protected 24 hours a day, seven days a week. The actual energy used when you read a Reddit post or order more toilet paper is extremely small; only a few grams of carbon dioxide are emitted each time. But consider the scale: Billions of people every day each complete dozens (or hundreds) of actions online. The carbon footprint of our devices, the internet, and the data centers we require account for 1.4% to 3.2% of our global greenhouse gasses.

DISRUPTIVE IMPACT

As smart homes proliferate, companies will continue to work to cut digital emissions. In 2009, Google opened a data center in chilly Hamina, Finland, to cut energy use. The act of cooling IT equipment eats up about 40% of the energy required by data centers. Now, Google will invest in additional cold-climate data centers. Google also uses high-tech evaporative cooling, smart temperature controls, and machine learning systems to automatically adjust energy consumption. Mozilla Firefox's Enhanced Tracking Protection blocks third-party trackers while cutting energy usage when you're online. It also employs search recycling: If you type in the search bar to navigate to a site, it requires data processing and energy consumption. Using autocomplete, rather than manually typing, to navigate back to your intended destination means zero carbon searching.

EMERGING PLAYERS

- Nokia
- Ericsson
- Firefox's address bar
- DigiPlex
- ICTFootprint.eu

If every adult in the United States sent one less email a year, we could save 51,560 tons of CO2—the equivalent of taking 11,217 gas-powered cars off the road.

5TH YEAR ON THE LIST

Retrofitting Old Homes With New Technology

Smart home technologies, like automatic thermostats, can offer older homes new upgrades.

KEY INSIGHT

As smart home devices become more ubiquitous and affordable, people are working to retrofit old homes with new technologies.

EXAMPLES

You may already be living in the home of the future. Retrofitting the walls with conduit and cables, embedding surfaces with sensors, and deploying connected appliances and gadgets are ways to modernize existing homes, with results leading to improved energy efficiency, automation of everyday tasks, and new insights from the data your household generates. In the U.S., buying and retrofitting an older home can be more affordable than building a new one.

DISRUPTIVE IMPACT

The more technologies built into smart home systems and appliances, the more potential for things to go wrong—which means that in the near future, we should see new consumer demand for smart home repairs and for service companies with knowledge of how devices connect to the home network and to each other.

For now, many systems require a strong cabled internet system to work properly. That could change as 5G networks become more prevalent, enabling smart home technologies to work wirelessly without latency issues.

EMERGING PLAYERS

- Amazon Alexa
- Google Home
- Samsung SmartThings Hub
- HomeOS