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Choice in the smart home

Choice in the smart home means being empowered to decide what's best for one's home and life, including decisions about aesthetics and design, brands and devices, personal principles, technical control, and ways of interaction. It requires broad interoperability. And is strengthened by open standards, open source hardware and software, and local control.

Introduction

Choice in the smart home is ultimately about the power to make decisions for oneself. This applies to the things you bring into your home, critical judgements related to your values, and the whole range of preferences about the contours and colors of your life.

Privacy, for instance, hinges on the ability to choose what one shares, and with whom. An individual should have the sole power to *choose* whether to keep personal information totally secret, share just enough to enable desired functionality—or throw the doors open and allow the world to look inside.

At the same time, the power to choose applies to countless other decisions one makes for one's home. It even applies to what motivates us—*why* we make a choice, not just *what* we choose—including aesthetics, price, personal ethics, and principles.

As the leading non-profit foundation fighting for privacy, choice, and sustainability for smart homes, and every person who lives in one, the Open Home Foundation calls for prioritizing smart home interoperability and personalization, and for increased legal protections to strengthen consumer choice in the smart home.

Central concepts

Interoperability is the backbone of choice.

The ability for systems and devices to function together—to be *interoperable*—is central to giving people who live in a smart home the broadest powers of choice.

Consider a light you want to turn on when someone enters a garage. What happens when the one lightbulb that works in that space only functions over a single company's app or ecosystem of products? And what if your garage doesn't have an available outlet, and that ecosystem doesn't offer battery-powered motion sensors? You shouldn't be constrained by such limits.

When anyone besides you decides what's right for your home—particularly when they are motivated by profit—these constraints only grow. What if you'd like to control the bulb's output based on time of day, state of the garage door, who is standing nearby, if a package was just delivered, or the current weather?

With a closed system, and limited choices, such things are harder to achieve. And your home's design may end up overly influenced by a single corporate interest with a short financial attention span. Or fractured across dozens of apps with limited power. Or you end up losing functionality when yet another cloud-based startup goes out of business, or a company decides to start charging a subscription fee.

Interoperability—including the [adversarial kind](#), where a product or service, “plugs into existing ones *without the permission* of the companies that make them”—goes a long way towards improving your power of choice as a consumer. It broadens your range of options, and opens your smart home to nearly unlimited possibilities.

Importantly, when the smart home industry supports interoperability, people still retain the power to choose simple options, with limited configurability, easy defaults, and basic functionality. That choice stays with you.

Open approaches sustain choice over the long term

Open approaches—including open standards, open source hardware, and open source software—foster smart home choice in a sustainable, long-term way. Their use encourages competition and innovation, and makes it easier to support valuable qualities that have a lasting impact on consumer choice, like local APIs and greater user control.

This puts power into your hands. And into the community. And it mitigates a number of risks associated with closed standards, locked-down hardware, and software controlled by any single big business platform.

For instance, consider a bed that overheats or won't lay flat during an internet outage—or requires a subscription to set an alarm and change settings. A modern heating or cooling system you can't control while away from home because the company's internal servers are having an outage. A doorbell camera that gets an automatic firmware update removing features while opaquely introducing access to third-party surveillance.

Finally, open approaches also add choice to existing systems. For example, local control and greater interoperability between heating and photovoltaic systems that weren't designed to communicate with one another—enabling functionality to save on bills and reduce emissions.

A home is what *you* want it to be

At its most fundamental level, choice is also about personalization. You should be able to design your smart home with the same degree of personalization as earlier generations designed their homes. A smart home should lead to more, not less, choice.

This applies to how you and your household interact with your home: from voice, to mobile dashboards, to physical switches. But it also applies to having the widest range of options when it comes to materials, finishes, manufacturing processes, and even the organizations you do business with.

Just like some people put a lot of thought into the choice of wood used for a table—including where it was harvested, or if it was processed sustainably—you should be able to make similar choices about the connected hardware, software, and systems you bring into your living space. Importantly, these choices should not be limited by a lack of device or system compatibility.

Your home. Your life. Your choice.

Recommendations

With exceptions for legal restrictions and where it infringes on the rights of others, the Open Home Foundation holds the following positions:

Smart home devices and systems should be interoperable by design

Interoperability between smart home devices and systems is essential to promoting the broadest degree of choice for people who live in a smart home. Where feasible, open approaches, documented APIs, and local-first functionality should be standard—or supported and promoted over closed alternatives. We consider the following requirements critical to bolstering interoperability:

- **Open source:** Smart home hardware and software options that anyone can use, copy, modify, and redistribute—should be prioritized and promoted via licensing, funding, and resource support. This includes, where possible, free software, free alternatives for paid functionality, and reasonably priced, open hardware.
- **Open connectivity standards:** The connectivity standards that devices and systems use to communicate with one another should be vendor neutral, publicly accessible, and open to all. If you buy a smart bulb, for instance, it should be able to communicate with other smart devices or systems using an open connectivity standard. Ideally this standard should be implemented directly, but at minimum via widely available, reasonably priced adaptors.
- **Documented APIs and hardware:** An API, or application programming interface, is a technical solution that allows computers, devices, and services to communicate between one another. It's not enough for APIs to exist—they must be publicly documented in order to be usable without unnecessary barriers. APIs and their documentation, as well as documentation of hardware, should cover a product's main functionality; limits are reasonable for critical security issues or to avoid a majority of an organization's resources being used to update public documentation at the cost of development.

- **Local-first control:** Devices and systems should provide local-first control so that interoperability can take place within a home, on user-owned hardware and software—and not rely on third-party or external systems, software, or infrastructure. Devices and systems should continue to work locally without arbitrary limits when blocked from accessing the internet or servers hosted outside the home.
- **Low barriers:** Interoperability is strengthened by systems that are easy and seamless to use. This means, where feasible, eliminating: external dependencies, including those related to connectivity; first-party app restrictions to set up or access functionality; and any requirements for personal accounts on a third-party's servers—including for limited processes like device onboarding.

Personalization should be a priority

Because a smart home is ultimately still a home—the ecosystem of devices and systems used to make it smart should embrace personalization as a priority rather than as an afterthought. This extends to everything from choice of materials, to ways of interaction, and beyond. We consider the following guidelines central to prioritizing personalization:

- **Avoiding monopoly:** A healthy smart home landscape means overlapping features across product types and brands. Where there are multiple companies offering different takes on the same functionality based on different connectivity standards and functionality, a consumer has the best chance of finding a solution that fits their personal needs.
- **Deep customization:** Devices and systems should be do-it-yourself and tinker friendly, and allow users the deepest levels of customization (backed by accessible defaults). Such customization must be balanced against existing laws, and the avoidance of serious safety risks that are difficult to mitigate.
- **Accessible defaults:** Deep customization must be balanced by offering simple, beautiful, functional defaults in order to increase approachability and make living in a smart home possible for the broadest array of people. This applies equally to hardware features as it does to software, including dashboards, onboarding workflows, etc. Neither a person's technical ability nor their resources (such as time) should put building a smart home tailored to their personal designs out of reach.
- **Population-specific products:** It is not only OK, but desirable for there to be smart home products that serve unique segments of the overall population. This is particularly important when it comes to smart home devices and systems serving the

needs of underrepresented populations, from those with specific accessibility requirements, to unique use-cases or contexts.

- **Choice applies to closed approaches:** Choice extends beyond open approaches. People who live in a smart home should not be compelled only to use products that are open source, based on open connectivity standards, or highly interoperable. Systems that champion open approaches should also strive to give people access to all products, without arbitrary limits, including those following closed approaches.

Choice should be legally protected

Many aspects of consumer choice are already regulated by law. Choice in the smart home raises unique areas where regulatory and legal protections must likewise be extended. We consider legal requirements particularly important for the following subjects:

- **Adversarial interoperability:** A right should be established, and protected, allowing do-it-yourselfers, individuals generally, and all but the largest businesses to tinker with, improve, or extend the functionality of existing smart home products without first-party permission. Such regulation would help disrupt and dislodge the control of monopolistic tech platforms that harm users—expanding user choice, and spurring innovation.
- **Anti-consumer practices:** Such practices as arbitrary restrictions to interoperability, including the establishment of “walled gardens” or the use of platforms to assert market control; the use of cookies, banners, and deceptive patterns to identify and inconspicuously track users; surveillance pricing; and any third-party use of smart home data without clear, opt-in, revocable permission from the user should be banned. “Works with” and other programs¹ should be regulated so that they benefit users without being used as a means to arbitrarily restrict access or enact pay-to-play barriers.
- **Mid-cycle product changes:** Barring specific, credible security risks, or technical issues that cannot be solved with reasonable organizational resources, manufacturers should not be allowed to permanently remove basic functionality via software, hardware, or firmware updates after product release; mid-cycle hardware revisions that negatively impact functionality or longevity must be clearly labeled, ideally via new product naming or versioning, press release, and/or other means.

¹ The Open Home Foundation runs a Works with Home Assistant program, and a separate device database that it calls a “Wikipedia of smart home devices.”

Conclusion

Choice in the smart home is an important topic that impacts us all at a fundamental level—and must be addressed by a broad range of stakeholders. It is also one of the Open Home Foundation’s central principles.

To that end, this paper represents our current positions related to choice in the smart home, while acknowledging the evolving nature of technology and society, and the dynamic and diverse experiences of people who live in smart homes.

We call on all relevant stakeholders to take action. And above all, we call on legislators to move forward drafting regulatory frameworks and laws to enshrine the right to choice in the smart home. The Open Home Foundation stands ready to join those who live in a smart home to ensure that smart home devices and systems are interoperable, customizable—and give you the power to design your smart home’s aesthetics and functionality the way you see fit.



About the Open Home Foundation

The Open Home Foundation fights for the fundamental principles of privacy, choice, and sustainability for smart homes. And for every person who lives in one. It does this by supporting the development of open source projects, and open connectivity and communication standards. These projects include Home Assistant, ESPHome, and Music Assistant, which are used by millions of households around the world.