

How anti-repair practices are contributing to an excess in waste

Chase Vicente
Nature and Human Values
Colorado School of Mines
Golden, Colorado

chase_vicente@mines.edu

Abstract—Right-to-repair legislation is challenged by OEMs and larger firms, claiming concerns for end-user data privacy, IP infringement, and degrading of products with cheaper replacement parts. They use these claims to perpetrate practices of locking down software crucial for diagnosing technical issues, building products to be difficult to disassemble, and voiding warranty if they are opened. These practices reduce the incentive for a consumer to continue using a product after it fails, even if the issue is a minor fix, such as replacing the screen or battery. These often still functional electronic products are treated as disposables, instead of a tool which is able to be serviced back to its original function. Supporting right to repair is crucial to allowing the extension of product lifespan, which will reduce electronic waste, and minimize the environmental footprint of consumer goods.

I. WHAT IS RIGHT TO REPAIR?

The principle of right to repair is that if you own a product, you should have the ability to obtain the parts, documentation, tools, and software access needed to repair or modify the product. Right to repair as a movement is assertive of the concept “that ownership should be absolute”—that buying means buying the freedom to maintain it and restore it without relying exclusively on the manufacturer [1]. A meaningful piece of right to repair legislation should include several consumer-rights guarantees: access to fairly priced replacement parts; access to service manuals, or at the minimum, schematics; access to diagnostic or specialty tools; and the ability to unlock any software restrictions [2].

Decades ago, most consumer goods—such as cars and radios—were designed to be opened and serviced by anyone with basic mechanical skills, a lot of the time, there

were even service manuals and schematics printed inside the products or supplied with them. [2]. Louis Rossmann, founder of Rossmann Repair Group Inc. notes in a 2020 video introducing his standpoint on right to repair, that personal computers “came with thick books of schematics,” however, as of 2016, “repair centers cannot get access to schematics and diagrams.” This shows the shift in the culture surrounding repair, as electronics advanced and became physically smaller, these practices expanded beyond personal computers; household devices became increasingly dependant on software, began being sealed shut, and their technical information gate-kept from end users. Disposable products became the norm, and with repair being hindered heavily, the modern right to repair movement was born. A major turning point came in 2012, when Massachusetts passed the nations first automotive repair laws [3]. Fisher from Landline.Media, a news outlet reporting on the trucking industry reports that these laws required tools made available to the auto dealers also be made available for purchase to both owners and independent repair shops.

II. WHY IS RIGHT TO REPAIR IMPORTANT?

Global e-waste has reached critical levels: in 2024, the International Telecommunication Union reported that the world produced 62 million tons of discarded electronics, yet only 22.3% were properly collected and recycled [4]. E-waste carries a much larger environmental footprint than traditional waste due to toxic metals and chemicals within electronics, in addition to the complex manufacturing stages which came before the product was discarded. Extending device lifespans through repair directly combats this cycle

of waste. When products are prematurely discarded, new resources must be extracted and refined to take its place. As shown in analytical models from the 2022 article “Right to Repair: Pricing, Welfare, and Environmental Implications,” prolonging the use of a product can reduce waste generation and material throughout, making right-to-repair central to sustainable consumption [5].

A. Environmental concerns

[5], [6], [7]

B. Cost saving

[8], [9]

C. Ownership

D. Ethical Issues

This section will focus on the ethical issues surrounding IP infringement, and how replicability may parasitize manufacturer profits. [10]

III. HOW ARE MANUFACTURERS FIGHTING BACK?

Manufacturers increasingly employ design and business practices that make independent repair difficult or even impossible. Common tactics include the use of proprietary screws, excessive adhesive, soldering typically modular components onto boards, and physically welding housings together, blocking internal access [1]. These obstacles make simple maintenance impractical. Another barrier is the introduction of digital locks, many companies—such as Apple—require “part-pairing” on all hardware used in their devices. Without reprogramming of replacement parts by an authorized servicer, pervasive warnings may appear on screen, and the replacement parts could even be completely rejected by the motherboard [11]. Together, these barriers consolidate repair power within corporate monopolies, driving repair costs up, and eroding consumer choice and product longevity.

A. OEMs’ arguments

This section will focus on debunking other less-justified arguments for limiting repair. I will use these sources broadly throughout this whole section. [12], [13], [14], [15]

a) *Consumer Data Privacy*: The basis of this argument is that providing open access to debugging tools would allow a bad-faith independent repair person unfederated access

to consumer data stored on such device. This risk can be mitigated by allowing consumers control over their data and making end users responsible for the data security (I.E: Give them the option to set a password). This argument is from [15]. b) *Disincentivizing Innovation*: This argument comes from [14]. Reinauer claims that companies may shy away from creating more complex devices, or devices with electronics due to pressure from the law, as they would also have to provide consumers with access to repair parts, which would be a costly distribution effort.

IV. WHAT CAN BE DONE TO HELP?

A. Ongoing Lawsuits

[16], [17]

B. Other Activism and Demonstrations

REFERENCES

- [1] repair.org, “We Need Right To Repair.” [Online]. Available: <https://www.repair.org/>
- [2] L. Rossman, “What is Right to Repair? An introduction for curious people.” [Online]. Available: https://www.youtube.com/watch?v=Npd_xDuNi9k
- [3] T. Fisher, “Federal court rejects challenge to Massachusetts’ stricter right-to-repair law.” [Online]. Available: <https://landline.media/federal-court-rejects-challenge-to-massachusetts-stricter-right-to-repair-law/>
- [4] I. T. Union, “The Global E-waste Monitor 2024.” [Online]. Available: <https://www.itu.int/en/ITU-D/Environment/Pages/Publications/The-Global-E-waste-Monitor-2024.aspx>
- [5] C. Jin, L. Yang, and C. Zhu, “Right to Repair: Pricing, Welfare, and Environmental Implications,” *Management Science*, vol. 69, no. 2, pp. 1017–1036, Feb. 2023, doi: 10.1287/mnsc.2022.4401.
- [6] E. Terryn, “A Right to Repair? Towards Sustainable Remedies in Consumer Law,” *European Review of Private Law*, vol. 27, no. Issue4, pp. 851–873, Aug. 2019, doi: 10.54648/erpl2019044.
- [7] R. J. Hernandez, C. Miranda, and J. Goñi, “Empowering Sustainable Consumption by Giving Back to Consumers the ‘Right to Repair,’” *Sustainability*, vol. 12, no. 3, p. 850, Jan. 2020, doi: 10.3390/su12030850.
- [8] D. Hyatt, “Apple Surprisingly Supports White House ‘Right to Repair’ Law.” [Online]. Available: <https://www.investopedia.com/apple-surprisingly-supports-white-house-right-to-repair-law-8382562>
- [9] M. J. Kass, “Right to Repair and the Environment—Fix It or Nix It?” [Online]. Available: https://www.americanbar.org/groups/environment_energy_resources/resources/natural-resources-environment/2023-fall/right-repair-and-environment/
- [10] L. Brooks, O. Jones, I. Mera, and L. Minnewether, “Ethical Dimensions of the Right to Repair,” in *2025 Systems and Information Engineering Design Symposium (SIEDS)*, 2025, pp. 139–142. doi: 10.1109/SIEDS65500.2025.11021197.

- [11] L. Greenlee, "How Parts Pairing Kills Independent Repair." [Online]. Available: <https://www.ifixit.com/News/69320/how-parts-pairing-kills-independent-repair>
- [12] C. J. Luyi Yang and C. Zhu, "Research: The Unintended Consequences of Right-to-Repair Laws." [Online]. Available: <https://hbr.org/2023/01/research-the-unintended-consequences-of-right-to-repair-laws>
- [13] I. Brannon and K. Seyfert, "The Economic Downsides of "Right-to-Repair." [Online]. Available: <https://documents.nam.org/COMM/NAM-3740-Right%20to%20Repair%20Paper%20R4%20V1%20FIN.pdf>
- [14] A. Reinauer, "Two Wrongs Don't Make a Right to Repair." [Online]. Available: <https://cei.org/studies/two-wrongs-dont-make-a-right-to-repair/>
- [15] I. Brannon, "A Criticism of 'Right to Repair' Laws." [Online]. Available: <https://www.cato.org/regulation/spring-2024/criticism-right-repair-laws>
- [16] J. Calma, "John Deere accused of 'excluding' right-to-repair language in its manuals." [Online]. Available: <https://www.theverge.com/2024/10/3/24260513/john-deere-right-to-repair-elizabeth-warren-clean-air-act>
- [17] J. O'connor, "FTC sues Deere & Co. for monopolizing farm-equipment repair market." [Online]. Available: <https://www.apnews.com/article/deere-farm-repair-tractors-monopoly-85c18d35a1e0999decb535aa5d7c358e>