The Struggle for the Right to Repair in the United States

An STS Research Paper
presented to the faculty of the
School of Engineering and Applied Science
University of Virginia

by

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March 14, 2024

On my honor as a University student, I have neither given nor received unauthorized aid on this
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Consumers have usually been free either to repair their possessions or to pay others to repair them. Many manufacturers of digital devices, however, use adhesives, proprietary screws, and limited warranties that can make such repairs practically impossible (Ivanova, 2021). Earlier, in the 1950s, some automakers and other manufacturers limited access to parts and information needed for repairs. In the early 2000s, consumers responded to such practices by organizing the right to repair movement. Proponents argue that ownership of a product confers the right to use, modify and repair it. Right to repair carries substantial implications for the environment and for consumers' expenses. According to Bloomberg, in 2019 discarded electronics accounted for 53.6 million tons of waste, of which only 17 percent was effectively recycled (Lizarraga, 2023). According to the Public Interest Research Group (PIRG), Americans lose about $40 billion each year because they must replace electronic devices they cannot repair (PIRG, 2021).

In the US, critics and proponents of the Right to Repair Movement invoke interests, ideas and values in defense of their respective agendas. The movement's proponents include shop owners, national interest groups, and local and online repair communities. Critics of the movement include manufacturers and technology trade associations. Participants are divided over questions of consumer rights, repair costs, environmental implications, safety and intellectual property.

Review of Research

Yang, Jin, and Zhu (2023) doubt that a protected right to repair would save consumers money or reduce e-waste. They warn that "manufacturers might strategically adjust new product prices to mitigate their foreseeable profit loss from the right-to-repair legislation."

Mirr (2020) came to a different conclusion on the importance of legal intervention. " As software enabled devices inch closer to ubiquity and individuals become ever more reliant on them, the need for a secure right to repair grows simultaneously." Unlike Yang, Jin, and Zhu, Mirr believes that unless congress enacts sweeping repair laws these corporations are going to have a monopoly on repairs.

Jaeger-Erben, Frick, and Hipp (2021) examined user motivations for device repair. Jaeger-Erben, Frick, and Hipp state that a major piece of this debate is the cultural pressure to buy instead of repair. "We argue that material and social settings for repair are important but would hardly suffice, as long as novelty and innovation remain the more important and dominant meanings in current practices of consumption and production" (Jaeger-Erben et al., 2021). Jaeger-Erben, Frick, and Hipp discuss two major points, the first being that "Repair is impracticable in a culture of non-repair". The second point that Jaeger-Erben, Frick, and Hipp discuss is the obsession with novelty stating, "Novelty seeking is a socially supported thread to longevity". The researchers explain that along with the ease of buying new products there is also social currency that comes with having the newest gadget which further pushes consumers to buy instead of repairing.

Ackermann, Mugge, and Schoormans (2018) also studied factors predicting consumers' repair versus purchase decisions, devising a model from their findings. The researchers found two major axes for this decision: the motivation to take care of a device, and the ability to take care of a device. Ackermann, Mugge, and Schoormans found that as both indicators increased, the likelihood of choosing repair significantly rose, while the opposite trend was observed for the inverse. Roskladka, Jaegler, and Miragliotta (2023) studied the specific barriers for the repairability of electronics and found 26 barriers which were classified into a couple major

categories. According to the study, "that costs of diagnostics and repair, lack of spare parts, repair services and repair manuals may represent the most significant barriers to repair from a consumer's perspective." Building on the mentioned works, this paper will discuss points surrounding consumer rights, repair costs, and environmental implications versus a business model which incentives manufacturers to hinder repair efforts.

Consumer Rights

Purchasing a device should give consumers full agency over it, this is one of the major values that proponents raise in support for the right to repair. One of the largest right to repair interest groups called The Repair Association (n.d.) expresses, "It's simple. You bought it, you should own it. Period. You should have the right to use it, modify it, and repair it whenever, wherever, and however you want. Ownership should be absolute." Established in 2013, this interest group brings together repair shops and consumers to push for repair laws. In line with this sentiment, repair part e-commerce company iFixit (2022) stated, "Manufacturers of all kinds of things unfairly restrict their customers' repair options intentionally . . . We think that these manufactured roadblocks are unethical and unsustainable and should not exist." In a Youtube video, popular tech reviewer Marques Bronlee (2021) said the following when discussing the idea of ownership of electronic devices, "So if you own something and it breaks, should you be allowed to repair it? Honestly that should be a pretty easy yes across the board there is no problem and no one's going to stop you if you try to do it there is no law against it, but it's almost impossible to actually do it." As a popular youtuber with over 18 million subscribers, Brownlee's statement shows that many consumers feel that repairability and ownership should come hand in hand, but feel restricted by repair options.

Another key argument advanced by proponents of the right-to-repair movement is the financial strain imposed on consumers due to limited repair options. United States Public Interest Research Group (U.S. PIRG) estimates that "American households could save $330 per year by repairing our electrics on our own or going to independent repair shops, according to the reports analysis" (U.S. PIRG, 2021). While this amount might not appear significant to some, according to the U.S. PIRG, it totals approximately $40 billion nationwide. Manufacturers have established a profitable business model around repairs and warranties, exemplified by Apple's offering of AppleCare+, which ranges from $3.99 per month for iPhones to $49.99 for Apple Displays (Apple, 2024a). Manufacturers like Apple are known to restrict repairs, one such method being "a software handshake, using Apple's System Configuration tool. It contacts Apple's servers to "authenticate" the repair, then "pairs" the new part to your system so it works as expected . . . It's also impossible to pair any aftermarket parts—which means only Apple-authorized repairs can truly restore the device to full functionality" (Wiens, 2023). Tactics like this make buying a warranty or new device very enticing to consumers. Apple is not alone in being repair unfriendly, many electronics companies also use things like extended warranty purchases as a part of their business plan. According to a report, "The global consumer electronics extended warranty market was valued at $48.65 billion in 2020, and is projected to reach $198.99 billion by 2030" (Goswami et al., 2021).

In-order to combat these corporate repair prices, advocates of the right to repair want to empower small repair shops to become an affordable alternative. According to the FTC (2021), "Consumers whose products break have limited choices" going on to say most repairs require specialized tools, hard-to-obtain parts, and proprietary diagnostic tools. The report states that reduced access to third-party repairs hurts low income consumers the most. In an interview with

PBS, Jessica Jones, owner of an electronics repair shop, stated the following when asked about a recent iPhone repair which had a tiny nick on the home button cable, "I have a brand new iPhone home button, I could cure the problem if I was allowed" (Anderson, 2021). Although Jones is certified by Apple to fix phones, the shop she works at isn't authorized, so she is restricted in what she is allowed to fix and can't access tools that come with being certified. Louis Rossmann, another repair shop owner, stated the following when asked what changes he wanted to see by The Wall Street Journal (2021), "I'd like the teeth to be able to do the bare minimum, which is get us access to schematics, to board views, and to be able to buy these chips."

Another alternative option for repairs that right to repair advocates champion are local and online repair communities. One of these online communities is iFixit (n.d.). which states "As the world's largest online repair community, we help thousands of people fix their broken stuff every day. We also have everything you need to fix your electronic devices yourself ." iFixit is one of the largest e-commerce companies that sells repair parts as well as serves as a community hotspot providing free wiki-like repair guides for consumer electronics and forums for users to discuss and teach each other how to repair their devices. There are also in-person repair events and establishments called Repair Cafe/Fixit Clinics that provide parts and offer a space to work together as a community to fix devices. Urban Sustainability Directors Network (USDN) is one of these organizations that plans repair community events and says, "Community repair events are a social and enjoyable way to shift mindsets toward repair and extend the useful life of products" (USDN, n.d.). There is a Repair Cafe in Charlottesville called Cville TimeBank Repair Cafe (n.d.) and they explain, "The Repair Café teaches people to see their possessions in a new light and to appreciate their value, which helps change people's mindset. This is essential to kindle people's enthusiasm for a sustainable society."

Environmental Effects

In defense of their position, proponents of the right to repair point to environmental consequences of the current system. One the most prominent environmental interest group Environment America (n.d.) states, "Americans dispose of 416,000 cell phones each day — just one type of the electronic waste that's become the fastest growing waste stream in the world. Part of the problem is that manufacturers make it unnecessarily difficult to repair our devices, leaving us to throw out our old devices and buy new ones." Environment America also states that of these 416,000 cell phones only about 15 to 20 percent are recycled. Along the same sentiment Turiceanu (2023), an environmental journalist, explains, "E-waste accounts for 2-3% of annual global waste, but its composition is a lot more harmful than many other types. Mercury, cadmium, beryllium, and lead are just some of the toxic elements that contaminate the soil, water, and air, exposing us to serious health risks." The claim by these proponents is not without credibility, The World Economic Forum (2019), an international non-governmental organization, wrote the following in a report, "E-waste is now the fastest-growing waste stream in the world . . . .By 2040, carbon emissions from the production and use of electronics, including devices like PCs, laptops, monitors, smartphones and tablets (and their production) will reach 14% of total emissions."

Advocates of the right to repair movement attribute a lot of the environmental problems caused by e-waste to the business practice of planned obsolescence. According to Perzanowski (2021a), "the most pernicious forms of planned obsolescence are strategies to build products that don't last." When Aaron Perzanowski, professor at the University of Michigan, and an expert on the right to repair, was asked in a BBC interview about the environmental impacts of e-waste he said, "I see this as a deep-rooted story of strategies around planned obsolescence"

(Stokel-Walker, 2023). Nathan Proctor, Senior Director of PIRG, had a similar sentiment when interviewed by The Guardian saying, "We're not going to fix this problem person by person, changing how we treat smartphones. The companies that make millions of smartphones should just not make them to break" (Harris, 2020). Flipsen, a lecturer in industrial design engineering at the Delft University of Technology, explains that one example of planned obsolescence is the introduction of ultra thin or waterproof phones which require glued or soldered-in batteries which he says was "the most simple, quick and economical solution" (Fowler, 2022). Flipsen goes on to explain that other designs could've been picked saying, "For example, GoPro's adorable action cameras have user-removable batteries — and you can take the cameras for a swim. Samsung's Galaxy Buds contain batteries that are comparatively easy to pop in and out."

In-order to combat e-waste, proponents of the right to repair advocate for a circular economy. Rethink Waste (n.d.), a joint local recycling authority, describes a circular economy as, "A model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible." and emphasizes its importance explaining, "Right now, about 54% of our waste is still headed to a landfill, rather than being recycled." Some advocates such as Nathan Proctor, senior right to repair companies director at U.S. PIRG, emphasize the repair aspect of a circular economy saying in an interview with Wirecutter, "You can't make them last if you can't make them work . . . Any time a manufacturer says that they are being good to the environment, and then they refuse to let you fix your stuff, I just cry foul . . . We shouldn't be recycling usable technology, we should be reusing it. That's far better for the environment" (Klosowski, 2021). Another advocacy group with a mission to promote environmental and corporate responsibility called As You Sow (n.d.) support the idea of circular economy while emphasizing minimizing the need for natural resources

saying, "To promote a circular economy for electronics – whereby minimize extraction of natural resources and devices are kept in use as long as possible – manufacturers must make devices easily repairable."

Another issue that proponents highlight is the adverse effects of the overproduction of electronic devices. Environment America (n.d.) states, "This excessive waste damages our environment, both in the disposal of that waste and by requiring more extraction of new raw materials from vulnerable ecosystems." E-waste isn't the only dangerous result of excess production of electronic devices, the production of the device itself is damaging since extracting the resources needed damages the surrounding ecosystem. Along with the dangers of mining another issue is the vast amount of energy needed for production as stated by Shukla (2023), "Firstly, it has significantly increased the unsustainable process of mining that's required for the materials needed to produce technological products and while a phone's glass screen display is no longer laced with mercury and arsenic, most smartphones now run on lithium in batteries from which the metals are mined from salt flats in Argentina and Chile using large amounts of energy and water." The environmental costs of the production of electronic devices is further emphasized by Stratton, an associate instructor at Indiana University Bloomington, who has studied tech supply chains, saying, "Everything that happens before the device reaches you is very materially and energetically intensive — that's where the most greenhouse gasses are emitted and where the most violent ecological transformation takes place" (Ramirez & Duffy, 2021).

Right to Repair Opposition

One of the major points critics of the right to repair movement make is the infringement of intellectual property. In a letter to congress addressing a proposed legislation that would advance right to repair, State Privacy and Security Coalition, Inc. or SPSC (2018), which represents hundreds of manufacturers and business, stated, "Given the scope of products covered and what must be provided under the legislation – including diagnostics, tools, parts, and updates to software – it is highly likely some of that information would be proprietary. Providing unauthorized repair facilities and individuals with access to proprietary information without the contractual safeguards currently in place between OEMs and authorized service providers places OEMs, suppliers, distributor and repair networks at risk." Similarly the Hudson Institute, an American conservative think tank, had a similar sentiment saying in a policy memo, "State right-to-repair laws are unconstitutional because they directly conflict with the careful and time-tested balance of rights in federal copyright law . . . States should not waste scarce resources by enacting overbroad right-to-repair laws that are unconstitutional and are bad policy" (Hartline & Mossoff, 2022). Companies themselves also take advantage of currently intellectual property laws to reduce reparability efforts, "In order to invoke trademark law to clamp down on the gray market, Apple includes its logo on internal parts like batteries, processors, and cables . . . the resale of authentic goods bearing trademarks is generally lawful . . . Nonetheless, companies like Apple rely on the ambiguous origins of some gray market goods to seize lawful parts imported by repair providers" (Perzanowski, 2021b).

Another major pushback to the right to repair movement that critics use is consumer safety and security risks that arise by allowing access to repair information and tools. In the previously stated letter to congress SPSC (2018) writes the following, "Some types of repairs can

be extremely detailed, complicated, performed in someone's home, and, in some cases, dangerous to perform for those without proper training." In the same letter SPSC also comments on the security risks saying, "With access to technical information, criminals can more easily circumvent security protections, harming not only the product owner but also everyone who shares their network. In an era of sophisticated cyber attacks, we should not make it easier for criminals to hack security provisions." Manufacturers such as Apple have also cited security risks when lobbying Nebraska Lawmakers "to kill 'right to repair' legislation, telling them unauthorized repair will turn the state into a "mecca" for hackers" (Koebler, 2017). Another party that has shown concerns of safety and security that could be caused by right to repair laws is TechNet which represents several large tech firms. The vice president of TechNet, Carl Holshouser, stated in a recent FTC hearing, "Allowing unvetted third parties with access to sensitive diagnostic information, software, tools, and parts would jeopardize the safety and security of consumers' devices and put consumers at risk for fraud" (TechNet, 2021).

Manufacturers also oppose repair initiatives by enacting policies that punish or disincentive consumers to repair their devices. A major way electronics companies do this is by providing warranties, but including clauses that void the warranty if the device is modified without the permission of the manufacturer. One example of such a policy is one from Dell (2019) where it states, "3.4 This warranty is void if product or part identification labels are removed from the Hardware without written authorization from DELL EMC. Further, this warranty is void if additional Hardware or Software is installed on the Hardware without written authorization from DELL EMC, or if any tampering is detected with the Hardware." Similar policies are written by Samsung (n.d.) with some events that would void warranty being, "4. The serial numbers have been changed or removed from the product 5. Non-authorized modifications

to the products specifications . . . 13. Altered or modified products, such as reprogrammed DVD units for multi zone purposes." Similarly, Apple (2024) also has policies that state, "This Warranty does not apply: . . . (g) to an Apple Product that has been modified to alter functionality or capability without the written permission of Apple." A lot of these companies can detect modification by identification codes on parts as well as a physical warranty sticker that placed over screws which Peter Mui, founder of the Fixit Clinic says, "This creates a chilling effect because just lifting the tape damages it and it becomes evidence of tamper; consumers take pause before removing it" (Ivanova, 2021).

Conclusion

Perfect legislation that both empowers consumers to repair their devices while also addressing the safety and intellectual property concerts of critics will be a delicate balance. Already more and more states have started looking into or have enacted right to repair laws and major electronics companies like Apple have started to shift their stance on the right to repair. As public pressure rises and more legislation is passed it will be increasingly important for government bodies to monitor the effectiveness of the right to repair laws and their effects. After more proposed legislation has passed further research on their effects is recommended.

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