

Pliers and Screwdrivers as Contributory Infringement Devices: Why Your Local Digital Repair Shop Might Be a Copyright Infringer, and Why We Must Stop the Crazyiness

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In September of 2012, Apple announced that it had received two million pre-orders for the iPhone 5 within the first twenty-four hours it was available. And while this number is staggering, the previous year the iPhone 4S sold over one million devices during its first twenty-four hours of pre-order sales. While the iPhone is a single example, it represents a much larger truth—the use of embedded software and digital devices permeates our daily lives. Naturally, as technology becomes more ingrained, consumers will expect the ability to repair technology at a local repair shop. In addition, as the cost for technology drops and release dates accelerate, more individuals will frequently swap out older generation technology for the new model. While many individuals will trade in their older technology, a majority will hold on to it and later throw it away without a thought about the possible uses of the old device. And few will consider, even for a fleeting moment, the issues that will arise in relation to the new and old device because of the copyright laws. These issues include our ability to seek repair from local shops, to trade in devices, to recycle goods with embedded technology, and of course, to maintain the technology. All of these issues demand the right people to have the right information, often contained in a manual. Fortunately, the issue of manuals being free from copyright protection has been dealt with previously in the automobile industry. Unfortunately, the issue was overcome in the name of environmental law, thus avoiding the much larger debate in terms of the copyright protection afforded manuals that contain basic and important information. The time has come to renew the debate and consider the long-term consequences associated with protections afforded this critical information.

This Article aims to briefly consider the growth of embedded technology, the importance of manuals and other information, the growth of the throw-away culture, the environmental impacts of restrictions on the sharing of information, and the current legislative initiatives to address the overly strong protections afforded this important information. In light of this, this Article calls for more attention and discussion as it

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relates to the current copyright protections, and for a more balanced approach to these protections. This Article concludes by demonstrating the law must institute three changes to create a better balance: (1) limit the copyright protections afforded manufacturers in relation to manuals and similar publications to life of the device or new generation release, whichever is earliest, (2) remove restrictions related to unlocking and similar technology work-arounds, and (3) insist upon protections for the information contained within the trade-in device.

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I. INTRODUCTION

¶1 In the mid- to late-1980s, many drivers were amazed when their vehicles began giving them practical advice; a malfunction indicator light would illuminate a phrase, such as “check engine,” and the illumination would signal to the driver that the engine needed service. Since then, numerous indicator lights have been added: check oil, low gas, brake system, and, my personal favorite, the ABS light, all of which warn of problems with the vehicle and its performance. Of course, the increased use of computer diagnostic technology has led to an increased need for technologically savvy mechanics who must have access to manuals or a computer diagnostic system in their shop in order to fix the issues causing the indicator light to illuminate. However, many people are unaware that automobile manufacturers originally used these very manuals for competitive advantage. Copyright protections associated with the manuals made it virtually impossible for anyone to obtain the manuals needed for servicing the vehicle unless, of course, the repairer had attended an authorized certification program and received a current manual for the On-Board Diagnostic (OBD) system. In response to the business advantage of automobile manufacturers controlling access to manuals, Senator Al Gore and Representative Henry Waxman introduced federal legislation requiring automobile manufacturers to release manuals and other similar information. Unfortunately, the requirement arises in the Clean Air Act and was intended to facilitate wider use of OBD systems in an effort to promote better fuel emissions. Because the

debate was ultimately decided as an environmental issue, the focus of the debate resonated as a victory for environmentalists, but the larger debate of access to manuals was lost. As a result, consumers with highly complex technology lack the option to easily access legal copies of device-related service manuals. Responding to this lack of necessary information, service providers have created a niche market of illegal manual distribution. The debate about manuals has re-arisen as a result of digital devices, but this time consumers will not win the debate solely by arguing for better emissions and cleaner air. This time the debate will have to be resolved as a truly digital technology issue, but environmental issues will play a prominent role in the necessary legal adjustments.

This Article will examine the growing need for individuals to have access to information relevant to the upkeep and refurbishment of digital devices. Part II briefly describes the new issues created by the use of embedded software. Part III uses the automobile industry as a starting point because it is a prior and effective legislative response to industry failure to release information widely contained within device manuals. This Article then examines the need to release device information to assist in the continued growth of the refurbish, reuse, recycle movement with an eye toward environmental benefits that can be realized from such a movement. Finally, this Article concludes by arguing that minor and simple adjustments can be made to existing legislation to assist and protect individuals that refurbish and pass on their digital devices.

II. EMBEDDED SOFTWARE MAKES THE WORLD GO ROUND

While one might assume the phrase “embedded software” holds a universally recognized definition, it does not. Instead, as the drafters of Uniform Commercial Code Revised Article 2 quickly discovered, the phrase is one of the more controversial phrases within the last few years.² For the purposes of this Article,³ the term embedded software will mean computer software written to control machines or devices that are not typically thought of as computers. Applying this wide definition, one can quickly appreciate that our world depends on embedded software. Manufacturers “build in” embedded software into vehicles, telephones, modems, robots, appliances, toys, security systems, pacemakers, televisions and set-top boxes, and digital watches, to give but a small list. Chances are, just about everything you own has embedded software. In fact, as Matt

² See Philip Koopman & Cem Kaner, *The Problem of Embedded Software in UCITA and Drafts of Revised Article 2*, UCC BULL. (West Group), Feb. 2001, at 1–2, available at http://www.ece.cmu.edu/~koopman/ucita/01_ucc_bulletin.pdf; Philip Koopman & Cem Kaner, *The Problem of Embedded Software in UCITA and Drafts of Revised Article 2*, UCC BULL. (West Group), Mar. 2001, at 5–6, available at http://www.ece.cmu.edu/~koopman/ucita/01_ucc_bulletin.pdf; Philip Koopman & Cem Kaner, *The Problem of Embedded Software in UCITA and Drafts of Revised Article 2*, UCC BULL. (West Group), Apr. 2001, at 1–3, available at http://www.ece.cmu.edu/~koopman/ucita/01_ucc_bulletin.pdf.

³ Because this Article does not focus on “embedded software,” the definition can be left for a later debate. The definition, however, matters greatly as the distinction between goods and software is highly important in the determination of applicable law; for example, whether Article 2, UCITA, or general intellectual property law (fair use, first sale, etc.) covers the item in question. See *id.*; see also Andrew Rodau, *Computer Software: Does Article 2 of the Uniform Commercial Code Apply?*, 35 EMORY L.J. 853 (1986).

Burns of TechCrunch summarizes: “Right now the consumer electronics scene is shifting away from traditional personal computers where the term PC refers to a modular computer. The iPad, and its Android counterparts, are leading the charge into this brave new world of *digital appliances* rather than personal computers.”⁴

While embedded software is not the main focus of this article, it is highly important in the overall debate of access to service manuals and other documentation. The increasing use of embedded software makes almost all of our technology-driven world dependent upon the right people having the right information to service, support, and repair our products. Without access to this information, our products can only be repaired by a small group of entities. As Kyle Wiens, the creator of iFixit, laments: “Killing the manuals kills these [local repair] businesses. Repair isn’t economically viable without manuals: To service any complex product, repair shops need the service information encapsulated in the manuals.”⁵

Unfortunately, manuals are not always easy to obtain, as highlighted by the plight of Australian technology blogger Tim Hicks. Tim’s hobby is tinkering with computers, and he recognizes his hobby requires the use of service manuals. When he had difficulty finding some manuals, he remedied the situation by posting manuals online. Tim does not charge for downloading the manuals.⁶ In fact, his website appears to run no advertisements, pop-ups or anything of the sort.⁷ Nonetheless, on July 31, 2012, Tim received a cease-and-desist letter from Toshiba Australia demanding that he remove any links to and copies of Toshiba’s various computer service manuals from his website.⁸

⁴ Matt Burns, *Should Apple Make The iPad User-Serviceable? Nope, That’s Anti-Consumer*, TECHCRUNCH (Mar. 19, 2012), <http://techcrunch.com/2012/03/19/should-apple-make-the-ipad-user-serviceable-nope-thats-anti-consumer/> (emphasis added). At the end of 2012, there were 6.8 billion mobile subscriptions worldwide and 1.7 billion mobile phones sold that year. Some commentators predict that 172.4 million tablets will be sold in 2013. See *Global Mobile Statistics 2013 Home: All the Latest Stats on Mobile Web, Apps, Marketing, Advertising, Subscribers, and Trends...*, MOBITHINKING, <http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats/> (last visited Aug. 5, 2013). In 2012, there were 58.31 million iPads sold, 125 million iPhones sold, 35.16 million iPods sold, and 18.15 million Macs sold. See Josh Lowensohn, *Apple’s Fiscal 2012 in Numbers: 125M iPhones, 58.31M iPads*, CNET NEWS (Oct. 25, 2012, 3:44 PM), http://news.cnet.com/8301-13579_3-57540705-37/apples-fiscal-2012-in-numbers-125m-iphones-58.31m-ipads/. While PC sales are on the decline, they still represent a strong market. In 2013, 315,229 desktop and laptop PCs have been sold worldwide. The total number of devices shipped worldwide (including PCs, tablets, and mobile phones) is on pace to reach 2.4 billion units in 2013. See *Gartner Says Worldwide PC, Tablet and Mobile Phone Combined Shipments to Reach 2.4 Billion Units in 2013*, GARTNER (Apr. 4, 2013), <http://www.gartner.com/newsroom/id/2408515>.

⁵ Kyle Wiens, *The Shady World of Repair Manuals: Copyrighting for Planned Obsolescence*, WIRED (Nov. 12, 2012, 6:00 PM), <http://www.wired.com/opinion/2012/11/cease-and-desist-manuals-planned-obsolence/>.

⁶ *Toshiba Laptop Service Manuals and the Sorry State of Copyright Law*, FUTURE PROOF (Nov. 10, 2012, 4:37 PM), <http://www.tim.id.au/blog/2012/11/10/toshiba-laptop-service-manuals-and-the-sorry-state-of-copyright-law/>.

⁷ See Wiens, *supra* note 5; *Tim’s Laptop Service Manuals*, FUTURE PROOF, <http://www.tim.id.au/blog/tims-laptop-service-manuals/> (last visited May 2, 2013).

⁸ See *Tim’s Laptop Service Manuals: Toshiba*, FUTURE PROOF, <http://www.tim.id.au/blog/tims-laptop-service-manuals/#toc-toshiba> (last visited May 2, 2013); Letter from Toshiba (Australia) Pty. Ltd. to Mr. Hicks (July 31, 2012), available at http://www.wired.com/opinion/wp-content/uploads/2012/11/toshiba_timhicks_takedownletter.jpeg.

Like many bloggers would be upon receiving such a letter, Tim was surprised by Toshiba's request for the manuals' removal.⁹ And like most individuals would if they received a letter informing them their actions should be considered piracy,¹⁰ Tim removed the manuals and contacted Toshiba.¹¹ Despite his best efforts to continue to distribute service manuals online, Tim discovered the forthcoming legal battle would be prohibitively expensive, so he removed all of the Toshiba related material.¹²

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There is absolutely no doubt in terms of the copyright law in both the United States and Australia that the Toshiba manuals are protected by copyright.¹³ Toshiba has certainly created an original work,¹⁴ compiled the material in its own creative manner,¹⁵ and published it.¹⁶ However, copyright cannot protect facts, just a particular author's expression of those facts.¹⁷ Thus, some have taken to dismantling products with the sole goal of discovering hidden secrets and tricks of repair. Once these hidden gems are discovered, the individual may publish the findings in an original manual, free of the manufacturer's copyright claims. But the practical reality of the situation is that hardly anyone has the time, the resources, or the manpower to dismantle and create original

⁹ See *Toshiba Laptop Service Manuals and the Sorry State of Copyright Law*, *supra* note 6.

¹⁰ Most individuals do not think they are doing anything wrong despite what many argue about all of us being pirates. "64% of young people have illegally downloaded films and music, and most of them don't feel that bad about it." Tom Watts, *Internet Piracy: Are We All Secretly Career Criminals?* PLANET IVY (Mar. 11, 2013), <http://planetivy.com/news/27077/internet-piracy-are-we-all-secretly-career-criminals/>. Further, "Hollywood loses close to \$20.5bn (£13bn) to movie piracy in a year." Alex Hudson, *Is Piracy a Mega Problem for Hollywood?*, BBC NEWS (Feb. 3, 2013), <http://www.bbc.co.uk/news/technology-21251680>; see also STEPHEN E. SIWEK, INST. FOR POLICY INNOVATION, THE TRUE COST OF COPYRIGHT INDUSTRY PIRACY TO THE U.S. ECONOMY 5 (2007), available at http://www.ipi.org/ipi_issues/detail/the-true-cost-of-copyright-industry-piracy-to-the-us-economy. Cf. Anjanette H. Raymond, *Heavyweight Bots in the Clouds: The Wrong Incentives and Poorly Crafted Balances That Lead to the Blocking of Information Online*, 11 NW. J. TECH. INTELL. PROP. 473 (2013); Anjanette H. Raymond, *Intermediaries' Precarious Balance Within Europe: Oddly Placed Cooperative Burdens in the Online World*, 11 NW. J. TECH. INTELL. PROP. 359 (2013).

¹¹ *Toshiba Laptop Service Manuals and the Sorry State of Copyright Law*, *supra* note 6.

¹² *Id.*

¹³ See *Situation Mgmt. Sys. v. ASP Consulting*, 560 F.3d 53, 61 (1st Cir. 2009) ("SMS's creative choices in describing those processes and systems, including the works' overall arrangement and structure, are subject to copyright protection." (citing *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 350–51 (1991))). In fact, architectural drawings, including blueprints, plans, and drawings, have historically enjoyed copyright protection under the general category of "pictorial, graphic, and sculptural works" in the U.S. Copyright Act. See *Scholz Design, Inc. v. Sard Custom Homes, LLC*, 691 F.3d 182, 188 (2nd Cir. 2012) (quoting 17 U.S.C. § 102(a)(5) (2006)). Architectural works, such as buildings and structures, have received protection since 1990 under the Architectural Works Copyright Protection Act (AWCPA), Pub. L. 101-650, §§ 701–06, 104 Stat. 5089, 5133–34 (1990). *Id.*

¹⁴ See *Situation Mgmt. Sys.*, 560 F.3d at 60 ("Original, as the term is used in copyright, means only that the work was independently created by the author (as opposed to copied from other works), and that it possesses at least some minimal degree of creativity." (quoting *Feist*, 499 U.S. at 345)).

¹⁵ The Copyright Act, 17 U.S.C. § 103 (2006), allows copyright protection for "compilations" as long as there is some creative or original act involved in developing the compilation. See *Feist*, 499 U.S. at 348.

¹⁶ "Publication" is not required under copyright, but can affect the exclusive rights of the owner and their ability to enforce those rights. UNITED STATES COPYRIGHT OFFICE, CIRCULAR 1 COPYRIGHT BASICS 3, available at <http://www.copyright.gov/circs/circ01.pdf>.

¹⁷ See *Feist*, 499 U.S. at 348–49.

manuals—technology moves too quickly for this to be a realistic option. As a result, individuals and their service providers find it difficult to obtain some manuals since copyright protections impose limitations on distribution. In many ways, this causes embedded technology to be a reason for us to abandon digital devices earlier than we otherwise would. Repair is either too expensive when considered in light of the dated nature of the technology, or the service provider lacks appropriate information and therefore cannot perform the necessary repair. As a result, in many consumers' minds it is simply easier to buy new technology and throw out the old.

III. CONSIDER THE AUTOMOBILE INDUSTRY

¶7 Many of the debates surrounding the use of digital devices and the need for essential information are not new. In fact, the debate occurred most notably in the automotive industry when the growing use of embedded technology caused issues with service and resale. The market, however, has responded and adjusted to various legislative initiatives and discovered a previously untapped market—the used vehicle.

¶8 Last year, used vehicle sales in the U.S. rose 5% to 40.5 million even though prices increased as well.¹⁸ Of course, there are numerous reasons why used vehicle prices increased: older vehicles' holding value longer, an overall reduction in excess production capacity and time sitting on the showroom floor, the reduction in new vehicle leases during the financial crisis, and, of course, consumers holding onto their vehicles longer.¹⁹ In terms of this article, imagine a used vehicle owner not being able to find a local service repair shop with a manual for his newly acquired—yet older—vehicle. Just at a time when the vehicle is more likely to need maintenance, the consumer is less likely to be able to find a service repair shop able to perform upkeep on the vehicle. In the consumer's mind, purchasing a used vehicle would therefore require more effort and unreasonable cost, making a used vehicle a less attractive purchase.

¶9 This is not the case, however, because the Clean Air Act of 1990 requires manufacturers to supply service technicians with relevant maintenance and repair information.²⁰ Congress recognized that embedded technology within the vehicle (such as the On-Board Diagnostic (OBD) system) would require upkeep to improve emission over the life of the vehicle.²¹ It further recognized that long-term maintenance of the OBD

¹⁸ See Mike Ramsey, *Amid New Car Boom, Used Cars Are Gold*, WALL ST. J. (Feb. 21, 2013, 12:01 AM), <http://online.wsj.com/article/SB10001424127887323511804578300650170654978.html>; see also Brad Tuttle, *The Smoking Hot Market for "Gently-Used" Cars*, TIME (Feb. 27, 2013), <http://business.time.com/2013/02/27/the-smoking-hot-market-for-gently-used-cars/>.

¹⁹ See Ramsey, *supra* note 18.

²⁰ *Customer Choice in Automotive Repair Shops: Hearing Before the Subcomm. on Consumer Affairs, Foreign Commerce & Tourism of the S. Comm. on Commerce, Sci., & Transp.*, 107th Cong. 9 (2002) (statement of Bill Haas, Vice President, Technical Division, Education and Training, Automotive Service Association) ("The Clean Air Act's emissions requirements compelled the vehicle manufacturers to install much more sophisticated equipment on 1996 and newer vehicles. During the debate of the Clean Air Act Amendments, Congress saw fit to provide language protecting the independent repairer.").

²¹ Levy Joffrion, *Accessing Service Information Today*, AUTOINC. (June 25, 2004), <http://www.autoinc.org/archives/2004/june2004/mech.htm> (explaining that access to information needed to repair newer model vehicles "goes back to the 1990 Clean Air Act, which required that all vehicles built

system in the hands of the consumer could only realistically be achieved if local service and repair shops had the information needed to properly service the OBD across the lifespan of the vehicle.²² Congress, for all practical purposes, relaxed copyright protections and insisted upon releasing key information to the right groups of people so that we could all breathe cleaner air.

¶10

This was not widely supported by the automobile industry;²³ it was simply Congress ignoring critics and working around copyright laws. And the debate was far from over, as the automobile industry did everything it could to comply with the legislation while returning control of the overall service requirements to dealers and authorized repair shops.²⁴ For example, in an effort to limit the ability to repair the vehicle, automobile manufacturers have created proprietary tools that are often only available to franchised dealer technicians.²⁵ And of course, most readers are well aware of the “authorized” or “certified” technician designation hanging within many mechanics’ front doors. These certification programs provide the most up-to-date information and

after 1994 include a computer system to measure vehicle emissions”). For a history of various attempts to address air pollution issues, see Arnold W. Reitze, Jr., *The Legislative History of U.S. Air Pollution Control*, 36 Hous. L. Rev. 679 (1999).

²² Cf. Arlena Sawyers, *Power Study Examines Service Habits*, AUTOMOTIVE NEWS (June 1, 1998, 12:01 AM), <http://www.autonews.com/article/19980601/ANA/806010764#axzz2hgNt05IC> (“[T]hough 57 percent of the consumers who go to aftermarket service shops say price is among their reasons for not going to the dealership for service, price is not the most important factor when choosing a service provider. Convenient location is most important, followed by price and then quickness of service.”); *Repairing the 21st Century Car: Is Technology Locking the Consumer Out?: Hearing Before the Subcomm. on Commerce, Trade, & Consumer Prot. of the H. Comm. on Energy & Commerce*, 108th Cong. 42 (2004) (statement of William J. Haas, Vice President, Service Repair Markets for the Automotive Service Association) (“In the J.D. Powers and Associates Service Usage and Retention Study independent shops rate exceptionally high in customer service satisfaction.”).

²³ In the early 1910s, Ford executives expressed concerns about dealers’ repair work. “[C]ompany officials feared that customers dissatisfied with dealer repair work or prices would cut into company parts sales by patronizing independent repair shops that used ‘pirate parts’ not produced by Ford.” Stephen L. McIntyre, *The Failure of Fordism: Reform of the Automobile Repair Industry, 1913-1940*, 41 TECH. & CULTURE 269, 276 (2000). The automobile industry continues to resist widespread dissemination of the key information. See Herb Weisbaum, *Car Owners Fight for Choice of Mechanics*, NBC NEWS, http://www.nbcnews.com/id/44095196/ns/business-consumer_news/t/car-owners-fight-choice-mechanics (last visited Jan. 6, 2014).

²⁴ The automobile industry is well aware of the high value of the secondary market, including the market associated with maintenance and upkeep of the vehicle. *Right to Repair: Industry Decisions and Legislative Options: Hearing Before the Subcomm. on Commerce, Trade, & Consumer Protection of the H. Comm. on Energy & Commerce*, 109th Cong. 69–70 (2005) (prepared statement of Aaron M. Lowe, Vice President, Government Affairs, Automotive Aftermarket Industry Association) (“Dealership profits are no longer driven by new car sales alone, but also parts and service revenue.” Thus, without regulation, business advantages will continue to be gained through the use of protecting repair information contained only in manuals.).

²⁵ Of course, as will be discussed later, this is a frequent “trick” of technology manufacturers—create the need for special tools or adapters or frequently change charging devices—all in an effort to restrict the ability of customers (or local repair shops) to keep up with the newest gadgets. For a discussion of how this trick has been used in the automobile industry, see Norman W. Hawker, *Under Threat: Competition in the Automotive Service Aftermarket* 8–11 (AAI Working Paper #08-05, 2008), available at <http://ssrn.com/abstract=1337103> (summarizing and discussing Congressional testimony by various automobile mechanics associations about tricks used in the automobile industry).

tools to the mechanics, for a fee.²⁶ And because the tools often contain or read information of a digital nature, they may have embedded software that requires an ongoing license fee for its use and for software updates.²⁷ And the costs associated with these tools and corresponding licenses are often expensive; John Nielsen, Director of the Automotive Services and Repair Network for the American Automobile Association, noted: “The first thing that we found is to purchase the various equipment for each year is roughly \$107,000”²⁸ The cost alone often forces local service and repair shops, frequently needing to repair multiple vehicle models to survive, to send customers to the dealers.²⁹

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In response, there have been recent legislative initiatives to provide wider access to manuals and other basic information, often called the “right to repair.”³⁰ To date, only one state, Massachusetts, has passed right to repair legislation,³¹ and Congress has tried and failed several times.³² The Massachusetts bill (1) mandates that manufacturers immediately make available to the independent vehicle repair industry the same tools, software, and repair information that they make available to the franchised dealers;³³ (2) beginning in model year 2018, requires manufacturers to maintain all of their software and service information in an electronic database that is available to consumers and independent service facilities on a daily, monthly, and yearly subscription basis;³⁴ and (3) requires manufacturers to provide their diagnostic and repair software through a standardized vehicle interface.³⁵ Each of these provisions is designed to provide relevant and necessary information for the long-term maintenance of the automobile. In its most basic terms, the law is designed to fulfill an old need—the need for the manual and the tool associated with the repair and maintenance of the automobile. One hopes that these legal prescriptions are adopted by more states and are then expanded to require that all of our digital device manuals be made widely available.

²⁶ See, e.g., Eric Peters, *Dealer Or Not?*, CONSUMERS' RES. MAG., May 1, 1998, at 33.

²⁷ See Simson Garfinkel, *Deciphering Cars*, TECH. REV., Feb. 2004, at 80, available at <http://www.technologyreview.com/article/402437/deciphering-cars/>. Basic information on obtaining and licensing the IDS for Ford is available at *Overview*, INTEGRATED DIAGNOSTIC SYSTEM (IDS), <http://www.motorcraftservice.com/vdirs/wds/diagnosticsites/ids/mcs/> (last visited Oct. 11, 2013) (quoting a price of \$699 per one-year IDS software license).

²⁸ *Customer Choice in Automotive Repair Shops*, supra note 20, at 32.

²⁹ See, e.g., Angus Loten, *Mechanics Seek Out 'Right to Repair,'* WALL ST. J., <http://online.wsj.com/article/SB10001424052748703555804576102272750344178.html> (last updated Feb. 10, 2011, 12:01 AM).

³⁰ See Hawker, supra note 25, at 23–25.

³¹ MASS. GEN. LAWS ch. 93J (2012).

³² For example, see the Right to Repair Act of 2009, H.R. 2057, 111th Congress (2009). Calls have been made to yet again consider congressional action; for example, see AAIA, *CARE Urge Congress to Take Bipartisan Action Now: Pass the Right to Repair Act*, RIGHT TO REPAIR COALITION 2013 (Jan. 24, 2013), <http://www.righttorepair.org/news/Read.aspx?ID=132>.

³³ MASS GEN. LAWS ch. 93J, § 2(a) (2012).

³⁴ *Id.* § 2(d)(i).

³⁵ *Id.*

IV. ENTER THE ENVIRONMENTALISTS WITH CALLS TO REFURBISH AND REUSE DIGITAL DEVICES

¶12 The information gap and the struggles associated with the automobile industry are now reoccurring in the digital device world, with some major differences. As pronounced by TechCrunch author Matt Burns, “The very nature of this new [digital appliance] world demands products are *replaced rather than put on life support*. Without the quick purchase turnaround time, the innovation cycle will slow and perhaps cause the fast growing movement to collapse altogether.”³⁶ Unsurprisingly, the response to this statement was not positive as consumer groups, environmentalists, and various commentators all noted the “throw-away culture” endorsement aspects of this statement.³⁷

¶13 Regardless, consumer research suggests the growing reality of the throw-away culture. As BBC Science and Environmental author Gaia Vince writes:

Like the majority of consumer electronics, my camera has not been designed to be easily repairable. Thirty years ago, I could have found service manuals and spare parts for all camera models, as well as a thriving repair industry. But things have changed. Camera models have got far more numerous and complicated, and manufacturers no longer release repair manuals.³⁸

Ms. Vince is not alone in noticing the throw-away aspects of consumer electronics.³⁹ In fact, the debate has raged for well over a century.⁴⁰ The tide may be turning, however, since, as the Wall Street Journal highlights, consumers are quickly getting used to the idea of trading in or buying used phones. Joe Fronko, the president of PaceButler Corp., one of the largest U.S. dealers in used phones,⁴¹ notes: “You do it with your cars and don't think that's weird.”⁴² Of course, the manuals and other necessary information surrounding vehicles is more readily available.

¶14 Although few consumers actually look at manuals, their absence in physical or digital form can cause serious issues for those attempting to refurbish, allow reuse of the digital device, or both. The manual often contains the basic working information of the

³⁶ Burns, *supra* note 4.

³⁷ For example, see Elizabeth, *TechCrunch is Full of It: Repair is Exactly What Consumers Need* (Mar. 21 2012, 8:00 AM), <http://ifixit.org/1927/techcrunch-is-full-of-it-repair-is-exactly-what-consumers-need/>.

³⁸ Gaia Vince, *The High Cost of our Throwaway Culture*, BBC (Nov. 29, 2012), <http://www.bbc.com/future/story/20121129-the-cost-of-our-throwaway-culture>.

³⁹ There are numerous interesting books on the topic. *See, e.g.*, GILES SLADE, *MADE TO BREAK: TECHNOLOGY AND OBSOLESCENCE IN AMERICA* (2006); ELIZABETH GROSSMAN, *HIGH TECH TRASH: DIGITAL DEVICES, HIDDEN TOXINS, AND HUMAN HEALTH* (2006); SUSAN STRASSER, *WASTE AND WANT: A SOCIAL HISTORY OF TRASH* (1999).

⁴⁰ GROSSMAN, *supra* note 39, at 146. According to the U.S. Environmental Protection Agency (EPA), Americans discard more than 125 million phones each year, creating at least 65,000 tons of waste. *The Life Cycle of a Cell Phone*, ENVTL. PROTECTION AGENCY (Aug. 2004), <http://www.epa.gov/osw/education/pdfs/life-cell.pdf>.

⁴¹ *Sell Cell Phones for Cash*, PACE BUTLER, <http://www.pacebutler.com/sell-cell-phones-for-cash.cfm>.

⁴² James R. Hagerty, *Entrepreneurs Find Gold in Used Phones*, WALL ST. J., <http://online.wsj.com/article/SB10001424052748704520504576162431091194572.html> (last updated Feb. 24, 2011, 12:01 AM).

digital device. Diagrams, settings, and wiring schematics are sometimes of vital importance, especially if the local repair center is not a specialist in the digital device. Although refurbishment of a digital device can be done without a manual, the entity performing the refurbishment almost always has to either be certified or employ an authorized technician knowledgeable and certified to perform repair on the particular device. Customers' inability to seek repairs from local service providers or other device manufacturers means that refurbishment and trade-in options only exist in a very narrow set of circumstances. Therefore, no true trade-in market exists, which in turn creates little incentive to create an easy trade-in mechanism. The inability to easily trade in devices means the majority of consumers hold on to older devices, many of which are then thrown away at a later date without ever having the chance to be refurbished and reused.

¶15 Of course, manuals for digital technology are only important if consumers have the ability to repair, pass on, or sell their older technology. One of the newest debates surrounds consumers that are unable to unlock devices because of legal restrictions. In response to this growing issue, a bipartisan group of legislators has introduced a bill in Congress that would ensure that users have the ability to unlock their smartphones and tablets in order to switch carriers.⁴³ The Unlocking Technology Act of 2013 is a recent introduction to the Congressional schedule.⁴⁴ As one of the bill sponsors, Zoe Lofgren, states:

This bill reflects the way we use this technology in our everyday lives Americans should not be subject to fines and criminal liability for merely unlocking devices and media they legally purchased. If consumers are not violating copyright or some other law, there's little reason to hold back the benefits of unlocking so people can continue using their devices.⁴⁵

The other practical impact of this Act is to allow individuals to recycle or pass down phones without consequence in terms of their carrier contract. Should consumers desire a new phone, they can simply unlock their current phone and hand it down or pass it on to someone else. In these instances, reuse should be possible without the cell phone carriers' interference or prohibitions. Without this option, consumers simply hold on to devices until they are later discovered in the bottom of a drawer. The absence of an unlocking protection further enhances the throw-away culture because it is too much of a hassle for the consumer to pass on a device.

⁴³ *Reps. Zoe Lofgren, Thomas Massie, Anna Eshoo & Jared Polis Introduce Bipartisan Bill to Enable Cell Phone & Wireless Device Unlocking*, CONGRESSWOMAN ZOE LOFGREN, http://lofgren.house.gov/index.php?option=com_content&view=article&id=797&Itemid=130 (last visited Oct. 12, 2013); Timothy B. Lee, *Members of Congress Finally Introduce Serious DMCA Reform*, ARS TECHNICA (May 9, 2013, 1:50 PM), <http://arstechnica.com/tech-policy/2013/05/members-of-congress-finally-introduce-serious-dmca-reform/>.

⁴⁴ See Unlocking Technology Act of 2013, H.R. 1892, 113th Cong. (2013).

⁴⁵ Chris O'Brien, *Bill Would Guarantee Ability to Unlock Smartphones, Tablets*, L. A. TIMES, May 9, 2013 <http://www.latimes.com/business/technology/la-fi-tn-bill-introduced-to-guarantee-ability-unlock-smartphones-tablets-20130509,0,1143056.story> (quoting *Reps. Zoe Lofgren, Thomas Massie, Anna Eshoo & Jared Polis Introduce Bipartisan Bill to Enable Cell Phone & Wireless Device Unlocking*, *supra* note 43).

V. DON'T FORGET THE DEVELOPING WORLD ARGUMENTS

¶16 The plight of local repair shops and the domestic need to refurbish and reuse devices are not the only considerations, especially in light of the much larger digital appliance debate.⁴⁶ A market that is frequently overlooked is the foreign-based refurbish and resale market. Returning to the automotive industry as a starting point, many cars find extended life when sold into foreign markets at a significantly reduced price. These vehicles are well beyond warranty, and in most instances are even past their economic value—at least in a domestic market. Regardless, second hand vehicles are often exported into other countries despite the fact that their embedded technology is often more than one generation old. The older embedded technology can cause real issues with upkeep of the vehicle since the local market will not support the cost of manuals and training. Unsurprisingly, the absence of key pieces of information causes the local market to circumvent important protections and monitoring within the automobile. For example, the airbags in automobiles are only fully functional if the embedded technology is working properly.⁴⁷ As a result of lack of information to maintain the airbag system, individuals circumvent the warnings and other systems put in place to protect the consumer. Vehicles sold without fully functioning protection devices (such as airbags) are sometimes called “auto chocolate” because you never know what you might get.⁴⁸ This label is incredibly accurate considering the absence of information to repair technology embedded within the vehicle, making it potentially impossible to properly maintain or diagnose problems with the vehicle at all.

¶17 In a similar manner as the foreign second hand vehicle market, many digital devices could be sold into a foreign resale market.⁴⁹ Also known as the “bridge the digital divide” market,⁵⁰ this market has experienced explosive growth in recent years.⁵¹ The

⁴⁶ The need to repair embedded technology is also a hot debate within the home appliance world.

⁴⁷ Cf. Eric Peters, *The Ticking Time Bomb in Your Dashboard*, AM. SPECTATOR (Feb. 27, 2012, 6:07 AM), <http://spectator.org/archives/2012/02/27/the-ticking-time-bomb-in-your> (explaining that for some older cars, insurance companies would rather total the vehicle rather than repair it).

⁴⁸ See Yasmin Khan, *Developing Countries as Junker Graveyards: The Global Cost of Used Cars*, CITY FIX (Apr. 3, 2013), <http://thecityfix.com/blog/developing-countries-global-cost-used-cars-auto-chocolate-mexico-yasmin-khan/> (discussing the sale of used cars abroad and the difficulties created); Eliza Barclay, *Mexico's Used-Car Trade Gets Lift with New Law*, HOUSTON CHRON., Oct. 12, 2005, <http://www.chron.com/business/article/Mexico-s-used-car-trade-gets-lift-with-new-law-1517692.php> (discussing the term auto chocolate and the secondhand car trade).

⁴⁹ Of note, this would not be the same as electronic waste dumping that occurs. See BASEL ACTION NETWORK (BAN) & SILICON VALLEY TOXICS COAL. (SVTC), *EXPORTING HARM: THE HIGH-TECH TRASHING OF ASIA* (2002), available at <http://www.ban.org/E-waste/technotrashfinalcomp.pdf> (discussing the very real issue of e-waste and its disposal in foreign waste dumps).

⁵⁰ The digital divide is the disparity between widespread internet access in industrialized nations and limited connectivity in developing ones. Widespread use of mobile devices in industrialized nations is but one example. Bridge the Digital Divide is an organization seeking to refurbish and pass on older computers and similar digital technology. For more information, see Bridge the Digital Divide at <http://www.bridgethedigitaldivide.com>. Another such organization, Close the Gap, serves a similar purpose. Close the Gap is an international not-for-profit organization that is helping to bridge this digital divide by offering high-quality, cost-efficient used IT equipment to projects in developing countries. See Close the Gap at <http://www.close-the-gap.org/>.

⁵¹ See, e.g., Vanessa Clark, *Africa Sprints Ahead with Mobile Banking*, BIZCOMMUNITY.COM (Feb. 13,

Environmental Protection Agency reports that a cell phone is used for an average of eighteen months in the United States,⁵² which is clearly much shorter than the operational life of the device. Instead, for most consumers it is the life of the technology embedded within the device that causes them to consider replacing an older device.⁵³ Ignoring the desire for faster and better technology, however, reveals that cell phones and many other digital devices actually last a very long time. This is why the refurbish and resell market is exploding—not all consumers need or want the newer embedded technology. These “older” digital devices are creating a growing secondary market which allows customers to purchase these devices at a substantial discount and allows some groups to pass on these devices in an attempt to bridge the digital divide that exists in many parts of the developing world.

¶18 In 2011, James R. Hagerty of the Wall Street Journal noted: “ReCellular sells about 60% of its phones in the U.S. and the rest mostly to dealers in Asia, Africa, Latin America and Eastern Europe.”⁵⁴ Considering that ReCellular alone resold or recycled 5.2 million cellphones last year,⁵⁵ there must be a lot of phones in the secondary market. Africa is an easy example of the digital revolution.⁵⁶ According to the World Bank, Sub-Saharan Africa is now home to approximately 650 million mobile phone subscribers, a number that surpasses the United States and European Union.⁵⁷ While the use of mobile communications is exploding, new communication technologies are being tailored specifically to the developing world. For example, mobile banking is experiencing enormous growth. In June 2012, Orange Money⁵⁸ reported its four-millionth subscriber, with a reach across ten African countries.⁵⁹ As of February 2013, its reach is now thirteen countries with 5.6 million customers.⁶⁰ Each of these individuals can now deposit or

2012, 11:17), <http://www.bizcommunity.com/Article/410/78/70701.html>.

⁵² See *The Life Cycle of a Cell Phone*, *supra* note 40.

⁵³ See Herb Weisbaum, *Why You Should Buy a New Smartphone Every Two Years*, NBC NEWS (Dec. 6, 2012, 9:53 AM), <http://www.nbcnews.com/technology/why-you-should-buy-new-smartphone-every-two-years-1C7455618> (quoting Mike Gikas, senior electronics editor at Consumer Reports, as saying, “Operating systems and the applications that run on them are being updated constantly and the hardware on your phone may not be able to keep up.”).

⁵⁴ Hagerty, *supra* note 42. As Stephen Manning, chief executive of ReCellular Inc., one of the largest U.S.-based cellphone refurbishers, notes: “Within a few years, the used market could account for a fifth of all cellphone sales in the U.S.” *Id.*

⁵⁵ *Id.*

⁵⁶ See Killian Fox, *Africa's Mobile Economic Revolution*, GUARDIAN, July 23, 2011, <http://www.guardian.co.uk/technology/2011/jul/24/mobile-phones-africa-microfinance-farming>.

⁵⁷ See WORLD ECON. FORUM, WORLD BANK, AFRICAN DEV. BANK & MINISTRY OF FOREIGN AFFAIRS OF DEN., THE AFRICA COMPETITIVENESS REPORT 2013, Appendix D, (2013) *available at* <http://www.worldbank.org/content/dam/Worldbank/document/Africa/Report/africa-competitiveness-report-2013-main-report-web.pdf>.

⁵⁸ Orange Money is not the only business reaching into Africa, but it is likely the largest. For more information about Orange Money, see their website at <http://money.orange.co.ke/>.

⁵⁹ See *Orange Money Reaches 4 Million Customers and Launches in Jordan and Mauritius*, ORANGE (June 18, 2012), <http://www.orange.com/en/press/press-releases/press-releases-2012/Orange-Money-reaches-4-million-customers-and-launches-in-Jordan-and-Mauritius>.

⁶⁰ *Orange Money in Uganda: the 13th African Country to Choose Mobile Payments*, ORANGE, <http://www.orange.com/en/news/2013/fevrier/Orange-Money-in-Uganda-the-13th-African-country-to-choose-mobile-payments> (last visited Oct. 28, 2013).

withdraw money, pay bills, recharge phone credit, and transfer money to family members, all from their mobile phone.⁶¹ As in many countries, however, new phones can be expensive and as a result a secondary market is developing. However, since the market for new cell phones is still young, the secondary market for cell phones and other similar devices generally consists of older foreign devices that are imported into the market. And each of these older phones will work better, more safely, and for a longer time if all of the important pieces of information are available to the service and repair entities that seek to maintain these devices. This is true not just of cell phones, but of all goods with embedded software that land in a secondary market—all of these goods will work longer and in a safer manner if the technology is properly maintained.

VI. ENVIRONMENTALISTS FOCUS ON E-WASTE AT THE END OF THE LINE

¶19 As previously suggested in this Article, e-waste is a growing problem for the digital device community.⁶² “According to the Earth Day Network, Americans produce over 50 million tons of e-waste.”⁶³ Unfortunately, e-waste concerns are not limited to the sheer volume of the waste because incinerated or slowly decaying e-waste releases harmful chemicals that leak into the ground and atmosphere.⁶⁴ E-waste is a problem that will need to be addressed, and soon. Of course, one of the easiest ways to prevent problems like this from occurring is to properly recycle the devices. However, as Earth Day Network’s president Kathleen Rogers explains, “Every county in the United States has a solid waste program, every county, every city, every state has [sic] solid waste program, but there is no real program for e-waste.”⁶⁵ And the problem is compounded globally as “[e]ach county has a different way that they collect e-waste, some may ship it to another state, some have partnerships with different recycling companies, and some do not do anything at all.”⁶⁶

¶20 The ease of creation, the sheer volume, and the environmental impact of e-waste has prompted responses from industry and consumers alike, resulting in Congress considering the reintroduction of the Responsible Electronics Recycling Act.⁶⁷ At the

⁶¹ See Jennifer Lazuta, *Report: Mobile Phones Transform Lives in Africa*, VOICE OF AMERICA (Jan. 28, 2013), <http://www.voanews.com/content/wold-bank-reports-says-mobile-phones-transform-lives-in-developing-africa/1592270.html>.

⁶² See *supra* notes 40–41 and accompanying text.

⁶³ Shoshana Davis, *E-Waste: What Happens with your Outdated or Broken Gadgets*, CBS NEWS (Apr. 22, 2013, 12:22 PM), http://www.cbsnews.com/8301-205_162-57580445/e-waste-what-happens-with-your-outdated-or-broken-gadgets/.

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ Responsible Electronics Recycling Act, H.R. 2284, 112th Cong. (2011) (identical to S. 1270, 112th Cong. (2011)) (died in committee); Paulie Anthony, *Everything You Need to Know About the Responsible Electronics Recycling Act (RERA)*, E-CYCLE (Aug. 15, 2013), <http://www.e-cycle.com/everything-you-need-to-know-about-the-responsible-electronics-recycling-act-rera/>; *Bipartisan Responsible Electronics Recycling Act Introduced in Congress*, ELECTRONICS TAKEBACK COALITION, <http://www.electronicstakeback.com/2013/07/24/bipartisan-responsible-electronics-recycling-act-introduced-in-congress/> (last visited Oct. 13, 2013).

heart of the Act is a restriction upon the exportation of electronics that are not working or that contain certain toxic chemicals.⁶⁸ However, the Act would allow the exportation of tested and working parts and products,⁶⁹ as well as returns of products or components under warranty.⁷⁰ As such, devices that have life left in them could be exported into a foreign market, reducing the disposal of devices that remain functional. In the long run, this approach is intended to help the environment by being a realistic alternative to the throw-away culture and the resultant staggering growth of e-waste. Unlike the automobile legislation that focused on clear air, this Act is about more than protecting the environment⁷¹ because the Act also promotes investment in our domestic industry by managing our own e-waste⁷² within our own borders.⁷³ As the Coalition for American Electronics Recycling (CAER) study highlights, the processing of e-waste in the United States has the potential to create 21,000 full-time recycling jobs and 21,000 additional indirect jobs with a corresponding payroll of \$772 million.⁷⁴ Barbara Kyle, national coordinator for the Electronics TakeBack Coalition, further highlights: “This study shows that if Congress takes action to make sure e-waste goes to U.S. recyclers instead of being exported to developing nations, then they will be creating tens of thousands of jobs for Americans and growing our economy”⁷⁵ Although some commentators argue against the Act because much of the language overlaps with existing international law,⁷⁶ the majority of commentators support better e-waste measures because they will create domestic jobs.⁷⁷

⁶⁸ H.R. 2284 § 3024.

⁶⁹ *Id.* § 3024(b)(3)(B)(ii).

⁷⁰ *See id.* § 3024(b)(3)(B)(iv).

⁷¹ The environment was the only concern during the clear air debates surrounding automobile legislation. For example, cars contain a lot of materials and parts, which has led to auto recycling becoming a multi-billion dollar industry. It is estimated that 14 million tons of steel from cars is scrapped each year, contributing to an industry-wide total of 74 million tons of recycled steel and iron. *See INST. OF SCRAP RECYCLING INDUS., INC., ISRI: THE VOICE OF THE RECYCLING INDUSTRY (2011), available at* <http://www.isri.org/CMDownload.aspx?ContentKey=1d7c41b3-68a6-46a6-a128-ae75323136f4&ContentItemKey=68c2cbf2-6bd8-49f4-8453-75a3365a4744>.

⁷² The Bill defines “restricted electronic waste” to include electronic equipment such as computers, televisions, printers, copiers, video game systems, telephones, and similarly used electronic products (but not parts of motor vehicles), that contain cathode ray tubes, batteries, switches, and other parts containing lead, cadmium, mercury, organic solvents, hexavalent chromium, beryllium, or other toxic ingredients. H.R. 2284 § 3024(b)(2).

⁷³ *See, e.g., New Study Shows Federal E-Waste Export Bill Could Create up to 42,000 Jobs, ELECTRONICS TAKEBACK COALITION, http://www.electronicstakeback.com/2013/02/05/2594/* (“Federal legislation that would restrict exports of electronic waste from the U.S. to developing countries could create as many as 42,000 direct and indirect new jobs with a total payroll of more than \$1 billion”) (citing DSM ENVTL. SERVS., INC., *JOBS THROUGH ELECTRONICS RECYCLING (2013), available at* http://americanrecycling.org/images/CAER_Jobs_Study_Report_-_January_2013.pdf).

⁷⁴ DSM ENVTL. SERVS., *supra* note 73, at i.

⁷⁵ Curt Harler, *Trash or Treasure?*, RECYCLING TODAY (Apr. 1, 2013), <http://www.recyclingtoday.com/rt0413-responsible-electronics-recycling-act.aspx>.

⁷⁶ *See id.*

⁷⁷ *See id.* (“The original legislation was supported by major electronics manufacturers, including Dell, HP, Apple and Samsung, as well as by the retailer Best Buy and the Coalition for American Electronics Recycling (CAER), which represents 82 U.S. companies that operate 158 electronics recycling and

VII. WINNING THE WAR IN THE DIGITAL TECHNOLOGY INFORMATION COPYRIGHT DEBATE

¶21 As demonstrated by the numerous arguments presented in this article, such as the need for easy repair, the increased need to help the environment and the developing world by refurbishing and reusing devices, and the e-waste dilemma, we all should be working together to encourage a broader package of legal incentives to reuse old devices. This includes industry, because addressing the growing e-waste issue will have a serious impact on job creation and have a knock-on economic impact.⁷⁸ Environmentalists, industry, and the general public will benefit from the various legislative initiatives.

¶22 So far two issues have remained conspicuously absent from this Article and must be addressed. One frequently overlooked issue is copyright in relation to manuals. It is possible that consumers would be less likely to casually throw away devices if there was a true secondary market for their devices; however, this market can only truly exist if those purchasing the devices have access to manuals and other necessary information. Yet, copyright law restricts access to manuals and other information necessary to prolong the life of these devices. Maybe the arguments that swayed Congress to relax copyright protections for car manufacturers will also sway Congress to reduce the copyright protections afforded manufacturers of throw-away electronic devices.

¶23 If language to reduce such copyright protections were included in one of the Congressional Acts that have been discussed,⁷⁹ it is likely that a balance could be struck between the manufacturer's copyright protections and the consumer's need for information and manuals. Unlike the wholesale exception to copyright for the automobile industry required for environmental reasons, such a harsh approach is not needed in the case of digital devices. The issues that arise with digital devices do not arise until later in the device life cycle, often at the point a consumer decides to upgrade their device. Thus, unlike with automobiles, the environmental impacts occur at a later time, thereby allowing for some copyright protections to be afforded to manufacturers. To that end, Congress should include a basic copyright protection in the Act that is restricted in time to the life of the device or one generation—whichever milestone passes first.⁸⁰ The inclusion of this language would make the support of industry more likely and create wider access to vital information within the secondary device market.

disposition facilities in 34 U.S. states.”).

⁷⁸ *See id.*

⁷⁹ It could also be included and considered within the discussion surrounding copyright reform in the United States. *See generally* Mike Masnick, *House Judiciary Committee Sets Up First Hearing on Copyright Reform*, TECH DIRT (May 8, 2013, 4:03 PM), <http://www.techdirt.com/articles/20130507/17274422984/house-judiciary-committee-sets-up-first-hearing-copyright-reform.shtml>; Derek Khanna, *House Judiciary Subcommittee's First Copyright Hearing*, FORBES (May 7, 2013, 8:06 PM), <http://www.forbes.com/sites/derekkhanna/2013/05/07/house-judiciary-subcommittees-first-copyright-hearing/>.

⁸⁰ Life of the device is the positive use of the more commonly known phrase, “end-of-life,” which generally indicates that the product is at the end of its useful life. At that point, a vendor will no longer market, sell, or sustain it. The importance of the inclusion of “or one generation” is significant as most retailers support the device for many generations, thus a device with last generation technology still often has some useful life left.

In addition to restricting copyright protections, Congress must consider the information contained on or stored in the digital device. When a consumer trades in his cell phone, for example, he has some confidence that his primary cell phone carrier is not misusing his information contained in that device. His trust may be misplaced, however, and is certainly suspect when the entity refurbishing the device is not a well-recognized merchant or cell phone carrier.⁸¹ As Robert Siciliano, an identity theft expert who consults for the digital security company McAfee, notes: “I was surprised that I found people's entire digital lives [on old digital devices].”⁸² As a result, many digital security experts recommend that consumers hold on to their old digital devices.⁸³ While some argue newer technology has addressed this issue,⁸⁴ most security commentators doubt the accuracy of this claim.⁸⁵ Siciliano also noted: “What's really scary is even if you follow protocol [to wipe the device], the data is still there.”⁸⁶ Some devices and operating systems do a very good job, but many do not.⁸⁷ And more importantly, consumers have no real idea how difficult it is to delete information.⁸⁸ In fact, many do not even take the most basic of precautions.⁸⁹ Of course, the loss of even a small portion of the information contained within a digital device can result in significant loss for the individual, even identity theft.⁹⁰ As such, the law should seek to protect individuals that trade in devices by assuming device manufacturers, operating system designers, and consumers themselves will do nothing to protect this highly sensitive information. The law should be designed to penalize trade-in entities that seek to improperly gather, use, or disseminate the information that is contained within the device.

⁸¹ Cf. Bottom Line, *Why You Should Never Sell Your Old Cell Phone*, NBC NEWS (May 8, 2012, 7:49 AM), <http://www.nbcnews.com/business/why-you-should-never-sell-your-old-cell-phone-759723?franchiseSlug=businessmain>.

⁸² *Id.*

⁸³ See Deborah Netburn, *How To Protect Personal Data on Devices You Plan to Sell*, L.A. TIMES, March 29, 2012, <http://articles.latimes.com/2012/mar/29/business/la-fi-tech-savvy-protecting-identity-20120329> (stating that Siciliano suggests that if you have a smartphone running Android or a computer running XP, you “don’t sell them at all”); Dan Graziano, *Selling Used Android Phones Poses Huge Identity Theft Risk, Expert Says*, BGR (Mar. 30, 2012, 1:25 PM), <http://bgr.com/2012/03/30/selling-used-android-phones-poses-huge-identity-theft-risk-expert-says/>.

⁸⁴ See, e.g., Bottom Line, *supra* note 81 (“Microsoft said newer versions of its operating systems have considerable security and privacy improvements.”).

⁸⁵ See, e.g., Becky Worley, *True/False: Never Sell Your Old Phone*, YAHOO NEWS (Aug. 22, 2012, 5:56 PM), <http://news.yahoo.com/blogs/upgrade-your-life/true-false-never-sell-old-phone-215656295.html>.

⁸⁶ Netburn, *supra* note 83.

⁸⁷ *Id.*

⁸⁸ *Id.* Another growing issue is cell phone based malware. See, e.g., Tim Conneally, *Mobile Antivirus: Don't Think About It, Just Be Sure It's There*, FORBES (May 10, 2013, 12:50 PM), <http://www.forbes.com/sites/timconneally/2013/05/10/mobile-antivirus-dont-think-about-it-just-be-sure-its-there/>.

⁸⁹ See Netburn, *supra* note 83.

⁹⁰ Cf. Daniel Bortz, *How to Spot the Warning Signs of Identity Theft*, U.S. NEWS & WORLD REPORT (Aug. 24, 2012), <http://money.usnews.com/money/personal-finance/articles/2012/08/24/how-to-spot-the-warning-signs-of-identity-theft> (“According to the 2012 identity fraud report by Javelin Strategy & Research, cases of identity fraud increased by 13 percent last year, with more than 11.6 million U.S. adults becoming victims.”).

VIII. CONCLUSION

¶25 Digital devices are beginning to create environmental issues similar to those created by automobiles of old. However, unlike automobiles, which lacked an easy “throw-away” aspect, digital devices are easily disposed of in the general waste system. The throw away aspect, however, allows for refurbishment and recycling in much greater numbers. Absent legal proscriptions on the disposal of devices in the general waste system, technology creators must begin to encourage a secondary market for used digital devices. Similar to the automobile industry, the secondary market for used digital devices could become robust in both domestic and international markets, thereby providing incentives to use devices longer rather than throwing them away. However, the secondary market will not fully flourish without necessary information and key protections being built into the system. Consequently, to encourage a more robust refurbish and recycle environment, the law must do three things: (1) limit the copyright protections afforded manufacturers in manuals and similar publications to the life of the device or new generation release, whichever is earliest; (2) remove restrictions on unlocking cell phones and similar technology work-arounds (such as jailbreaking apps) and (3) insist upon protections for the information contained within the trade-in device. Congress is currently considering or introducing legislation to tackle some of these issues, but the language of the initiatives must clearly contain prescriptions that support these three overall needs. Should this occur, the secondary market for digital devices will have a chance to flourish and the world will be better environmentally. More importantly, the suggested adjustments will be among the most reasonable approaches to copyright and privacy law within the last quarter century.

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