

Designing For The Scrap Heap:

Does Fairphone represent a sustainable alternative to the designed obsolescence of iPhone conventions?

Abstract:

What will follow is an analysis of the impact of planned obsolescence on smartphone lifespan, and the consequences that a diminished lifespan has on the environment. The essay will define planned obsolescence and its subterms, including functional, qualitative and desirable obsolescence, as well as other phenomena such as indeterminacy, enshittification, e-waste and anthropocentric rationality, before presenting the smartphone industry (particularly Apple and Fairphone) as a case study for examination. The essay will present an overview of planned obsolescence within smartphones, using infamous examples such as Apple's *Batterygate* and parts pairing to demonstrate that consumers are pressured into certain unsustainable practices by the manufacturers. It will present Fairphone's design choices, from the supply chain to the modularity, as an alternative to typical capitalist practices, as well as the 'right-to-repair' as an example of legislative action in thwarting planned obsolescence tactics. The essay will explore the environmental and ethical concerns surrounding the deliberate programmed decay of technology and the fabricated difficulty of repair, examining how these unfriendly business practices contribute to an alarming problem of waste. Indeterminacy and abstraction in relation to the expected lifespan of our devices will be investigated, with an emphasis on consumer beliefs. Research surrounding the behaviours of consumers in regards to DIY repair will be presented to suggest that current repair methodologies are not having the desired effect, and that consumer mentalities need a seismic shift in order for planned obsolescence to be eradicated. A conclusion will be drawn that suggests that planned obsolescence conventions are not only the responsibility of the corporations, but also the cultural decadence displayed by consumers in regards to smartphone consumption. This conclusion will state that, for factors such as its small size and material composition, Fairphone and its smartphones do not pose a realistic alternative to Apple's iPhones, therefore unable to break the conventions of planned obsolescence, due to the consumer attitudes discussed. Fairphone is successful in defying planned obsolescence and smartphone manufacturing conventions within its own line of consumption, but is not able to make a global impact. All of the research conducted is desk research.

Design Rationale:

For my Element 2 submission, I have designed an animated composition resembling an Apple infographic. This infographic is inspired by the idea of subvertising; I have mimicked the visual identity of Apple and their advertising campaigns to highlight their involvement in e-waste and planned obsolescence conventions. ‘Subvertising’ is a public art movement which seeks to regain control of advertising capital, through the creation of visuals which resemble advertisements but with the purpose of “stigmatising brands and raising consumer consciousness” (Oxford Reference 2025). Throughout the essay, an essential way to examine planned obsolescence was to do the same, verbally, to companies who dominate the market such as Apple, thereby drawing attention to alternatives such as Fairphone. I have closely followed the principles of scale, typography and negative space that have become synonymous with Apple’s sleek visual identity, to create a series of assets that could either live on a billboard individually, or together as a digital subversive infographic. Harnessing the power of subvertising felt like the most effective visual alternative for the approach I took to writing my essay. In terms of the animation, I purposefully went for a maximalist approach to movement as a further nod to subvertising, in an attempt to satirise Apple in a way that was recognisable but not corporate.

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Introduction:

The ownership of personal smartphones is arguably the most accelerated and ubiquitous piece of technological innovation ever seen in human history, with a global impact and widespread adoption. According to Statista, there's an estimated 6.7 billion smartphone subscriptions worldwide as of 2023 (Taylor, 2024), and a shocking 10 billion mobile connected devices in operation (Howart, 2024), outnumbering the world population. With this staggering abundance of phones comes the issue of planned obsolescence, which exists as a conceptual villain in the field of design, technology and economics. To begin to understand the role in which planned obsolescence plays in the realm of smartphone design and production, it is important to define it and its derivatives, as well as a set of other key terms that will support this analysis.

Planned obsolescence can succinctly be defined as “a situation in which goods are deliberately made or designed so that they do not last for a long period of time” (Cambridge Business English Dictionary, 2011). Within the contexts of a consumerist society, Pope, in my opinion, offers what could be argued as the most apt definition of planned obsolescence as “the artificial reduction of the durability of consumer goods to induce consumers to purchase substitute products before they need to and therefore more often than they normally would.” (Pope, 2017, p45.). This aptitude comes from Pope's mention of consumer behaviours as an integral part to how we understand planned obsolescence, which the Cambridge definition lacks.

Through this, the way in which we describe how our products and environments obsolesce has had to expand, creating a tree of prefixes in which to replace the ‘planned’ within ‘planned obsolescence’ to provide further context. The earliest literature example of this is found in Vance Packard's ‘The Waste Makers’, where obsolescence of function, desirability, and quality are introduced (Packard, 1960). This essay will refer to Packard's definitions of planned obsolescence closely, as they offer a valuable distinction between ways in which corporations obsolescence products

Obsolescence of **function** is when a product has been replaced by a product which is superior in operation (Packard, 1960). This is arguably a positive form of natural obsolescence given

that it requires technological innovation; it is particularly relevant to the smartphone insurgency seen since the innovation of the original iPhone in 2007 and the subsequent evolution to the smartphones of today.

Obsolescence of **quality** is when a product breaks down over time (Packard, 1960), which could simply be put as material ‘wear and tear’. This has the capability of being planned in the choices made during manufacturing, but in many ways it is difficult to avoid the natural degradation of materials and objects. This is the obsolescence seen with the “Batterygate” scandal, in which, through class action lawsuits, Apple was accused of deception in regards to the ‘slowing down’ of its iPhone 6, 7 and SE models through software updates without notifying any owners (Gerken, 2024). This is perhaps the most commonly alluded to form of planned obsolescence, as this definition applies often in regards to corporate decisions to determine product lifespans in exchange for market stimulation.

Obsolescence of **desirability** is a psychological phenomenon defined as a product becoming worn out due to how it is perceived by us, and the perception of other available models, while the product is totally within its usable lifespan (Packard, 1960). This can also be defined as progressive obsolescence, seen famously with the actions taken by General Motors CEO Alfred Sloan in 1923, by repackaging the same car in a different shaped body to suggest a luxury and innovation that simply did not exist within. This is also often what is meant by people when they refer to the blanket term of ‘planned obsolescence’ as a corporate malefactor in the world of design, and can be seen with recent smartphone innovations and the consumer expectation to have a new model available yearly or bi-yearly.

Other key terms that will appear in this paper besides the aforementioned are anthropocentric rationality, indeterminacy, enshittification, and e-waste.

Anthropocentrism describes the belief that humans are the most important living beings on Earth. Pope (2017) highlights anthropocentrism as a significant factor in the development of our current consumerist society, describing the gradual shift away from animistic belief to a Cartesian view that separates humanity from the inanimate natural world, explaining our current aggressive approach to dominating the natural world. This can be simplified as a shift from an ecocentric perspective to an anthropocentric one. Putting human interests at the

centre of our processes leads to a destructive relationship with our planet that fails to consider biological needs in favour of efficient commerce.

E-waste is an initialism of ‘electronic waste’, described by the W.H.O. as items that are “discarded as products break or become obsolete and are thrown away” (World Health Organisation, 2024). According to the W.H.O (2024), it is among the fastest growing stream of solid waste in the world, and presents a huge risk to both the environment and to those who interact with it once it becomes a waste product, where it is often children who are tasked with sorting and disassembling our electronic waste.

Indeterminacy is a word with different meanings depending on its context. Principally, it means “the state of not being measured, counted or clearly known” (Cambridge English Dictionary, n.d). The term exists within philosophy, stemming from Nietzsche's criticism of Kant’s “Ding an sich” or the noumenon. It describes cases where there are “no facts of matter”, and is contentious due to debates as to whether it is a semantic or metaphysical topic. Within music, it defines an approach to composition pioneered by John Cage which leaves room for interpretation through ambiguity; similarly, within literature indeterminacy defines the ambiguity of interpretation amongst different audiences. This essay will define indeterminacy within the context of the unknown lifespan of our smartphones, using it as a tool to explore the ambiguity surrounding how long our phones last, or should last.

Finally, enshittification is a neologism coined by Cody Doctorow, a science fiction author and journalist. Enshittification describes the “decay” of online platforms and services, which Doctorow (2023) claims happens as a result of intentionally user-antagonistic practices after companies operate at a loss to build a large enough user base to begin to become appealing to business customers, only to alienate and profit from their business customers shortly after. This will be explored in this paper in relation to the way Apple has been viewed to operate within the smartphone industry, but it is important to note that Doctorow’s enshittification is specific to online platforms such as Amazon or the Apple App Store.. This essay will use enshittification as a heuristic tool, to examine the current state of repairability of smartphones, and the attitudes that companies such as Apple have towards repair legislation.

With these key terms defined and in mind, the purpose of this paper is to investigate the following question: “is rapid obsolescence within smartphone design inevitable, or is it

arbitrarily constructed by industry forces?”. To a degree, the answer to this is obvious, however this paper will be exploring the following questions as a means to answer this one. How does our current consumer society play a part in this lifespan construction, and the way in which consumers and corporations are complicit in ecologically unsustainable consumption and production levels? Are all the previously defined subterms of planned obsolescence inevitable, and is there a balance to be struck between market growth through these tactics and consumption levels? What is the role of repair in our efforts to limit consumption and regain agency over how quickly our products become obsolete? Is our technology too advanced to be DIY repairable?

The case study in this essay is, broadly speaking, the smartphone industry, however a lot will specifically be said about Apple and their iPhone, and the ethically minded Fairphone and their Fairphone 5. The industry itself acts as an example as to how obsolescence can be enacted through marketing, disposal and design. This is seen with difficult to replace batteries, excessive glueing of components, serialisation of parts and layers of proprietary software. These design choices create a reality where it is easier and often economically more viable for the consumer to discard a two year old smartphone and purchase a new one, rather than seek a licensed repair. My research questions will help decipher whether this rate of obsolescence is an inevitable side effect of our rapid innovation, or corporate profit maximising, and whether or not alternative methods of design are viable. The justification for this research is the monumental challenge of e-waste, with an estimated 62 million tonnes being produced in 2022, with only 22% formally documented as recycled (World Health Organisation, 2024).

Chapter 1: The Economics and Design of Obsolescence

A Historical Overview:

Planned obsolescence is not a very new term, contrary to the modern associations of capitalist corporate practices. The term is found in literature as early as 1932, where Bernard London in his book titled *‘Ending the Depression through Planned Obsolescence’* devised a system in which the Government would assign a lease of life to all products of manufacture, when they are first created. His scheme pronounced objects legally “dead” at the end of their assigned lifespan (London, 1932), which is just one example of entities providing frameworks in which to render consumer goods obsolete for economic progress. Interestingly, London is rarely cited as the one who coined the term, but his ideas denoted a mindset in which lifespans of objects need to be set in order to manufacture a market for their continued repurchasing. In this sense, his definition is removed from Pope’s planned obsolescence, as it encourages state intervention rather than being a product of market forces. Daniel Abramson traces back to an early 20th century adoption of planned or built-in obsolescence in the American real estate market, particularly Chicago in the interwar period which saw an immense amount of structural upheaval. This originated from the ability to deduct “obsolescence related losses of value” (Abramson, 2016, p.20) from tax payments, leading to planned obsolescence first developing amongst the real estate classes and disseminating to civilians in the 1930s. Similarly to the works of London, Abramson compiles charts created by Chicago real estate associations which make attempts to categorise buildings by their lifespans, with banks having longer lifespans than hotels due to their immunity against visual trends (Abramson, 2016). Generally, planned obsolescence as we understand it in a Capitalist context is dated to becoming popular in the 1950s, through American industrial designer Brook Stevens, who was responsible for cosmetic annual redesigns of lawn mowers to utilise the power of obsolescence of desirability (Bradley, 2005). Vance Packard’s definitions of obsolescence in his work *The Waste Makers* (Packard, 1960) provide us with a very applicable set of definitions for planned obsolescence which I have defined previously, and will refer to throughout.

As briefly alluded to earlier, a key historical example of planning a products obsolescence dates back to the 1920s; in an attempt to grapple with Ford Motors as well as a saturated

buyers market, General Motors (GM) president Alfred Sloan suggested releasing a new model of car each year, with the focus shifting from mechanical innovation to visual refreshment. This strategy of Sloan's reignited a market in which people were not buying cars, and led to GM overtaking Ford as the largest manufacturer of cars by the end of the 1920s (O'Brien, 1989, p79-87).

A Contemporary Overview:

In order to answer the research questions of this paper, it is important to examine the ways in which iPhones have been surrounded by discourse of planned obsolescence, and how this contrasts with manufacturers such as Fairphone who appear to design for longevity as opposed to pure profit.

Since the production of the first iPhone in 2007, Apple has released an iPhone almost every year, with the only exception being 2012. Apple has in recent years been known for announcing multiple versions of iPhones at the same time (or in the case of 2017, where Apple announced both the iPhone 8 and the iPhone X). When considering this yearly rollout of devices, it could be argued that this is the result of the innovation within the field, and that these releases are making use of the rapid improvement of smartphone technology that can be clearly observed. Apple CEO Tim Cook justified the annual releases by stating that older models are being traded in as users 'upgrade' their devices, and that Apple does a lot of work to extract value from older iPhones through resale or parts extraction (Patel, 2023). It is also very easy for the more cynically minded to view this as a form of dominating the market to maximise sales, and manufacturing the desire for the replacement of perfectly good iPhones. Considering the fact that iPhone sales account for just over half of Apple's entire sales revenue, it is easy to see why a steady stream of demand for iPhones would be prosperous for the company (Laricchia, 2024a). Are large smartphone manufacturers such as Apple capitalising on consumer anxieties in favour of maximising profits? Is it possible that the annual releases of new iPhones are influencing the consumer base into believing the model they own is now functionally obsolete, when in reality it is likely just desirably obsolete, much like General Motors in the 1920s? This is known as the fear of missing out, often

abbreviated as FOMO, describing a psychological motivation for the over-consumption habits we observe in contemporary behaviour (Argan et al, 2022).

Infamously, Apple has been involved in lawsuits internationally for its actions in a saga since dubbed ‘Batterygate’. Apple admitted to intentionally and discreetly throttling the processing power on older models of iPhone in an attempt to prevent battery shutdowns, through unexplained software updates. While this action did fix the issue of unexpected battery shutdowns, it also created the new problem of reduced performance compared to pre-update. It became a public spectacle upon the revelation that a simple battery replacement for old phones brought them back up to high performance levels, but this admission by Apple happened a year after the initial reports (Shi, 2018). The innards of a modern smartphone resemble the concept of a “monstrous hybrid” as seen in Braungart & McDonough’s (2002) *Cradle to Cradle - Remaking The Way We Make Things*. This term describes the way in which modern products are a compilation of valuable materials that are difficult to separate at the end of useful lifespan, which renders it all waste material in landfill rather than being able to repurpose or recycle elements of designs (Braungart & McDonough, 2002). Rather than promoting the replacement of the battery in an iPhone 6, Apple chose a path of obsolescing its quality, rendering whole phones as waste materials as opposed to a single lithium-ion battery. Apple holds no moral obligation to behave any differently - in the contexts of a consumer capitalist society, their actions are justified by the means of production, rather than moralist judgements.

Enshittification is a term which I think can provide a lot of meaning in discussions of planned obsolescence in phone design. Doctorow (2024a) has focused heavily on Apple as an entity in the market, describing the monopoly which they have created through the creation of a high quality product (iPhone) and then the “locking in” of its users by making an ecosystem where all user data and functionality is tied to Apple products and services (closed-source iOS operating system). Doctorow uses Apple’s role in the 1998 Digital Millennium Copyright Act as a pillar of enshittified practice, highlighting how Apple fought for a rewriting of DMCA 1201 which made it a felony to be involved in the ‘jailbreaking’ of a device, regardless of whether or not it leads to copyright infringement (Doctorow, 2024b). Jailbreaking is the modification of a device to bypass restrictions that are set by the manufacturer, often with the view of user customisation but in the case of iOS it typically is done to install apps and software that isn’t permitted by iOS and Apple. A key aspect of

enshittification is this lack of freedom surrounding platform migration, through the denial of “interoperability” (Doctorow, 2024a). Does this closing of the Apple ecosystem present an ethical issue when it comes to e-waste and consumer freedoms? Works such as *The Cult of Macintosh* aim to identify the devotion exhibited by consumers towards brands, namely Apple. This closing in of the consumer entraps them into an ecosystem where they are expected to purchase regularly, ultimately becoming a cultural ritual that sweeps consumers into new habits. A key element of Apple’s business model is their desire to “own the consumer” (Montgomerie & Roscoe, 2013, p.1), which ultimately makes planned obsolescence conventions a key way for them to manipulate their market.

In a practical sense, this also manifests itself in an inability to adequately repair your own devices. Apple is infamous for their unique adoption of pentalobe (five point) screws across all of their devices, which could be viewed as a way to obstruct user access to their devices. In 2011, Nokia phones were still relevant in the market, and the ability to replace your battery as well as pop off your phone backing was still commonplace, except with pentalobe screwed iPhones. While the inability to replace the current battery on our smartphones is a consequence of their evolution, the obfuscation and extortion of repair methods can be viewed as enshittification in the way that acts against the interest of the user to extract financial gain for the company. This demonstrates the enshittification of smartphone repairability as a whole, when remembering the bygone devices with removable backings. Fairphone, in an attempt to promote repairability, makes the decision to design their phones with an easily accessible battery and removable backing, which seems bold in the current landscape of phone design.

A key example of this consumer entrapment is the concept of serialisation or ‘parts pairing’. The iPhone operating system is designed in such a way that all parts have to be verified by Apple in order to have normal functionality. While it is arguable that this practice is to protect the intellectual property of one of the largest smartphone manufacturers in the world and disable modding attempts, an issue arises in the context of totally legitimate DIY repairs using legitimate Apple parts still requiring expensive authorisation. This falls under both enshittification and obsolescence of function, creating a product which cannot be repaired without manufacturer price gouging. Serialisation in itself is a practice originally used for inventory or assisting in repairs, but the practice of software locking and parts pairing seems to go beyond this original purpose. The state of Oregon passed a bill to ban parts pairing

practices in devices made after 2015, coming into effect in 2025, in an effort to aid DIY repairs and promote sustainable use. Doctorow (2024b) asserts that anybody who bypassed parts pairing in repairing their devices was, under DMCA 1201, committing a felony offence, fostering an utterly unsustainable and anti-consumer practice through law, and echoing the seminal ideas of Bernard London. HP Printers were infamously inundated with error messages regarding no-HP ink cartridges, with dubious claims about protecting the security of their users, to discourage users from using “unofficial” cartridges (Harding, 2024). Manufacturers are in a position where they are permitted to intentionally make the repair and upcycling of their products difficult and expensive for consumers, which contributes to the growing e-waste problem as well as price gouging.

There is an undeniable ‘obsolescence of function’ through organic innovation that can be seen across the iPhone generations, but arguably not for each model. For example, the iPhone through to the iPhone 5 create a stark contrast for 5 years of separation, in terms of the exterior design as well as the shift from a skeuomorphic UI to the now familiar flat designs of modern iOS. A debate arises given the almost annual release of iPhones for 16 years, combined with Apple’s visible engagement of planned obsolescence practices, as to the necessity of annual releases. There remains the possibility that, through the development of smartphones to immensely high powered machines, that our capacity to replace them at home is inevitably hampered, due to specialist equipment and a rising difficulty level. Although, according to Pope (2017) this rise in repair difficulty is considered to be a direct symptom of a strategy of planned obsolescence, there is the possibility that as a result of reliance on specialised technology, we are sacrificing convenience of repair and giving away aspects of autonomy.

Take for example, the process of battery replacement, which Apple have recently tackled by announcing their ‘Self Service Repair Program’, allowing for the leasing of specialist equipment directly from Apple to aid consumers in replacing device parts. This process is tackled by Sean Hollister, writing for the Verge, in his article *Apple shipped me a 79-pound (35.8kg) iPhone repair kit to fix a 1.1-ounce (0.03kg) battery*. In an almost surreal process, Apple ships two pelican cases full of equipment including an “industrial grade heat station” for loosening the screen adhesive (Hollister, 2022). As a reward for following the ringbound manual with clinical precision, users are still greeted with an ‘Unknown Part’ detection warning, since Apple engages in parts pairing practices. The formatting of this repair process

as something so convoluted does not instill users with a sense of accessibility surrounding their right to repair, which this is further evidenced by Apple's pricing of this program; \$119 for the battery and tool kit rental with a \$1200 credit card hold as a deposit, which Apple reserve the right to keep if you fail to return the tools within seven days. As Hollister (2024) surmises, "this way, Apple gets credit for walking you through an 80 page repair, instead of building phones where - say - you don't need to remove the phone's most delicate components and two different types of security screws to replace the battery". This program does not help in the easing of functional planned obsolescence as it does not address the factors which make our devices difficult to repair and prolong, effectively acting as a gesture to appear supportive of right to repair laws.

Is parts pairing an inevitable consequence of innovation? Or is it a symptom of calculated planned obsolescence? Perhaps a practice such as parts pairing follows the obsolescence framework outlined by Pope (2017, citing Packard, 1960, p57), acting as a strategy to ensure the success of planned obsolescence of quality through high cost of maintenance and repair of consumer goods. Particularly relevant is "increasing the inaccessibility of parts required for repair" (Pope, 2017, p57), but it is easily argued that forcing consumers to seek manufacturer validation for legitimate DIY repairs is another branch from the same tree, with "the use of strategies to ensure that purchasers would return to the market" (Pope, 2017, p57). Now, consumers have to return to the market without even purchasing a new product, amplifying profit through obsolescence of quality.

Chapter 2: The Environmental Impact of Obsolescence:

We're E-Wasting Away

A key consequence of the rapid and planned obsolescence of smartphones is the growing issue of e-waste, which constitutes discarded electronic devices. Within the cradle to cradle design method, the term “products plus” is introduced (Braungart & McDonough, 2002, p.38). “Products plus” is a term that describes our products plus the unknown things that they contain, often ecologically or personally damaging, that we did not anticipate being there. The example is given of a polyester shirt and a water bottle, containing carcinogenic heavy metals that are made more bioavailable through contact with human sweat, or in the processes which we rely on to downcycle waste products, such as incineration (Braungart & McDonough, 2002). When we apply this to smartphone design on a whole, we are able to visualise a number of ethical concerns regarding the resources needed for manufacture and the waste created when discarded. Toxic chemicals are a huge concern regarding the afterlife of our technology, with the handling and disassembly of disposed tech exposing humans and our environment to hazardous material (World Health Organization, 2024). It is worth considering the ecological implications of smartphones from cradle to grave, in order to understand the need for a viable alternative to rapid obsolescence.

In terms of issues prior to the consumer receiving their iPhone, Apple has been accused of knowingly relying on child labour in manufacturing plants in China (Garside, 2013). More recently than this is the global concern surrounding the mining practices within the Democratic Republic of Congo, a resource rich country; a lawsuit filed on behalf of 14 parents and children from the DRC was levied to many large tech firms (Apple and Google are the smartphone manufacturers included), claiming the aiding and abetting in the death and serious injury of children working in the cobalt mines (Kelly, 2019). Even more recently are the accusations from the DRC Government that Apple is purchasing “illegally exported” minerals smuggled from the DRC to Rwanda (Carter, 2024). These ‘blood’ minerals, which are crucial in the mass manufacturing of electronic device components, are known as conflict minerals, due to their origin from areas embroiled in human rights violations and strife. This demonstrates another reason that the excess development of smartphones should be addressed, given the specificity and immorality of resources required. The gathering of these

minerals further highlights the impact of anthropocentrism on consumerism, failing to account for the communities and ecosystems that provide for consumption. These ethical concerns effectively turn your iPhone into the “product plus” (Braungart & McDonough, 2002) of a high powered smartphone with a chequered human rights record.

This ethical issue of the resources required to produce smartphones at the staggering rate needed is an issue that Fairphone attempts to address in their approach to design. It is not directly comparable to Apple in that they are two companies of starkly contrasting size, however it could also be argued that companies such as Apple would not necessarily need as large of a material pool if they were manufacturing devices in such a way that people could replace them and make them last slightly longer, without having to re-enter the market. Fairphone attempts to disclose its material supply chain, as well as acknowledging themselves that the conditions for mining cobalt in the Congo are morally unacceptable. Cobalt is a necessary component of smartphone batteries, so it could be hypocritical to publicly condemn a process whilst sourcing the very same material, but Fairphone routinely rank highly in the Ethical Consumer for its “measures to map out suppliers”, with the EC branding them as “the most ethical smartphones in the world” (*How ethical is Fairphone B.V?* no date). This acknowledgement of the issues surrounding cobalt mining act to raise awareness and lean on larger companies to spark change. For other mineral sourcing, Fairphone is much more successful at bucking the trend. Fairphone, unlike Apple, publishes its full supply chain in an effort to remain entirely transparent, as well as sourcing conflict free tin and tungsten at greater effort. Also notably, Fairphone has been instrumental in setting up an alternative Fairtrade supply chain for gold to avoid current chains which exploit child labour, which shows a great desire to ensure that the manufacture of its phones do not support the trading of conflict minerals. Fairphone attempts to disrupt the current industry standards and be something more than another “crude” smartphone (Braungart & McDonough, 2002).

The ecological impact of smartphones unfortunately does not begin and end with their manufacturing. E-waste is a growing environmental risk, with a record 62 billion kilograms of it being produced in 2022 alone (*The Global E-Waste Monitor*, 2024). Of this astonishing amount, less than 25% of it is recycled, piling into landfills and seeping toxic materials into the ground in a process known as “leaching” (Igini, 2024). This represents a huge public health concern, and shows an unfortunate lack of action regarding recycling as a way to

alleviate this. It is important to note that these e-waste figures are referring to all discarded electric appliances, so smartphones resemble just a slice of this pie; the Waste Electrical and Electronic Equipment (WEEE) posit that in 2022 there were 5.3 billion mobile phones discarded. When considering the obsolescence of our devices, it is key to consider that, despite the functional obsolescence of my inoperative smartphone, it retains value in the amount of precious materials inside of it, which could be extracted and used in the development of other phones. In this sense, the lifespan of our smartphones is abstract in that the lifespan of its parts is not equal to the lifespan of its sum, suggesting that there could be great benefit to adopting a cradle-to-cradle attitude towards our discarded devices, to help eliminate the burden on conflict minerals and public health. Fairphone aims to tackle the issue of e-waste with an emphasis on repair and recyclability; being a modular design allows for the DIY replacement of parts (Fairphone smartphones are even packaged with a screwdriver to assist in basic repairs) as well as having an easy to understand recycling program allowing users to send in their old phones. Apple also offers the same service, even giving credit for new purchases with phone trade-ins. These services exist and are easily accessible, however the uptake is low; the global rate of smartphone recycling is around 15%, with just 30% of reusable material being recovered, leading to only 5% of mined materials being recovered across all smartphones globally (McGovern, 2023). There seems to be a reluctance to engage in recycling practices for electronic devices amongst consumers. This is exacerbated by the “obsolescence of desirability” seen within smartphone ownership, with phones not being able to see out their entire useful lifespans before being replaced for the shinier model. The lack of uptake amongst consumers seems to suggest a form of cultural decadence that has manifested within smartphone ownership, showing a decline in responsibility and consideration towards our smartphones and their supply chain. Fairphone and Apple make attempts to facilitate the recycling of their products when they reach obsolescence, but ultimately cannot force consumers to do so.

Chapter 3: The Constitutional “Right to Repair”:

The Repair Movement

A way in which the consequences of human responses to obsolescence can be tackled is the strengthening of a consumer's ability to repair their devices themselves. This isn't to say that all consumers need to be equipped to successfully reverse engineer their phone, but rather be aided in troubleshooting the common faults within their smartphones, such as battery degradation, to prevent functional obsolescence. “Right to Repair” (RTR) is a recent movement that is gaining legislative footing worldwide, so it is still not a precise term to define in terms of what it means for consumers and companies on a practical level. The aim of the right to repair is to give consumers more agency over the repair of their devices through regulation of prices and availability of parts, as well as the banning of methods that are used to safeguard repairs, such as the recent bill in Oregon that bans parts pairing / serialisation from 2025 onwards (Weatherbed, 2024). The EU has made some significant gains in RTR and adjacent legislation; the infamous charger standardisation bill to homogenous electronic devices to a USB-C charging system is aimed at tackling e-waste as well as the buildup of obsolete charge cables. From the European Parliament directly, these are the four key measures of the RTR bills;

- Manufacturer has to repair a product for a reasonable price and within a reasonable timeframe after the legal guarantee period
- Access to spare parts, tools and repair information for consumers
- Incentives to opt for repair, such as repair vouchers and funds
- Online platforms will assist consumers in finding local repair services and shops selling refurbished goods

(Right to repair: Making repair easier and more appealing to consumers. 2024).

Additionally, manufacturers are no longer able to impede repair with contractual clauses or the serialisation of parts (*Right to repair: Making repair easier and more appealing to consumers. 2024*); opening the gateway for a second hand parts market or even a 3D printed parts market.

This, theoretically, will have a big impact on the way we view obsolescence, particularly planned obsolescence as it is commonly understood, as these legislations seemingly eradicate the current methodology for obsolescence of function by making it unlawful for manufacturers to degrade performance with updates and obfuscate repair measures. It fits within the sustainable consumerist frameworks outlined by Mickelthwaite in his chapter *Design Against Consumerism* (2019). Calling for long term thinking as a prerequisite for sustainable commerce as well as for the adoption of a cradle to cradle mindset within design, the smartphone industry is one that seems to require a shift in thinking to avoid issues such as e-waste.

France's government has attempted to remove the various ambiguities surrounding device repairability by implementing a repairability index to help promote a cradle to cradle economy of phone consumption. This index is scored on the categories of availability of documentation and parts, affordability of parts, ease of disassembly, and some product specific aspects. This seems to mimic the success of popular websites such as iFixit, which act as sacred texts in the world of DIY repair by providing accessible information as to how to repair your own device, often relying on the immaterial labour of user reviews and scoring systems to curate an informed user base. Manufacturers are expected to report the repairability of their smartphones (and a selection of other devices such as televisions) based on a set of criteria from the Ministry of Electronics.

While a welcome step in the world of conglomerate accountability, this does not immediately fix all the issues of e-waste and phone obsolescence. The Fairphone 5, in all its modularity, scores an exemplary 9.3/10 on the French index and a 10/10 on the iFixit index for repairability, topping both lists. The iPhone 13 pro scores a 6.2/10, for reference. This is another way of visualising the gulf between the two products in terms of ease of repair and modularities, for the reasons mentioned throughout this paper. Research conducted by the BIT shows that, 3 years on from the implementation of the French repairability index, a “positive but not statistically significant improvement” was seen, reflected by a “a clear increase in the sale of more repairable products” as well as the increasing of product scores over time, showing a manufacturer willingness to make their products conform to the scale (Sirera et al, 2024). While they admit it cannot be conclusively tethered to the introduction of the index, it shows marginal gains for the world of sustainable consumption, and suggests

some merit in legislative intervention to aid consumers and prevent the symptoms of planned obsolescence outlined by Pope and others. It seems more to suggest that having RTR legislation puts pressure on companies to change practices, rather than consumers. Just because everybody may have the ability to repair their devices, does not mean that everybody will be repairing their devices. Mickelthwaite (2019) says that within a consumer society, the dominant force that spearheads consumer culture is convenience.

This begs the question, how much impact does the consumer have on planned obsolescence conventions? Given that there seems to be a way to make companies behave more sustainably as shown by the French repairability index, is this effort undermined by consumer habits and decadence? In order to understand this better, we need to explore the indeterminate nature of our devices and theories that confront the responsibility of the consumer

Chapter 4: Consumer Expectations and Technological Impermanence:

Upgrade Upgrade Upgrade!

As mentioned earlier, there is a difficulty in identifying the lifespans of our smartphones, which is paramount to be able to understand any form of their obsolescence. This indeterminacy regarding how long a smartphone *should* last is the basis for a lot of the debate regarding planned obsolescence; do our smartphones last as long (or little) as they are designed to, or is this influenced by consumer behaviours? The lifespans of our technology, for the purpose of this paper, can be characterised by the performance of the hardware as it degrades over time, and the efficiency that users are able to complete tasks as observed on a curve. According to the Consumer Technology Association (CTA), user expectations regarding smartphone lifespans have actually increased by just under a year between 2011 to 2021, to a current expectation that our personal smartphones will last 5 years (Koenig, 2023). There seems to exist a disconnect between the expectations in this study and what we observe in obsolescence culture. A brief Google search of *how long do smartphones last?* yields immediate results that suggest the number is closer to 2 years, with user answers ranging from 15 months to 3 years. While this is hardly an irrefutable research method, it can act as a tool to point toward this disconnect between how long the consumer expects their phone to last and how long it may have been designed to last, functionally. Smartphones, unlike other household technology historically or currently, have carved out a niche of being a high volume, short term item, constantly needing repair due to obsolescence of desirability or hardware. Mickelthwaite (2019) notes that “if everything is disposable, or has a replacement cycle far shorter than the material qualities of the product would suggest, there is little incentive to think long term”. A device full of valuable materials that are intensively mined, that you are recommended to replace every 24 months, lacks sustainable design thinking, considering the currently low uptake of phone recycling and the marginal incentive to do so.

What are some examples of philosophies that could be employed in the world of smartphone design and consumption in order to overcome issues of obsolescence? Perhaps a closer understanding of the value of the materials inside a smartphone, and the sheer contrast between the high value and low value ones, would offer some perspective on their ageing. Elements such as the screen and the body are prone to cracks, scratches and kinks over time,

the typical ‘wear and tear’ that exists as natural obsolescence due to age, yet touchscreens are increasingly difficult to replace as well as expensive when other parties are enlisted. The lithium batteries in smartphones are prone to degradation and obsolescence of quality, yet they also cannot be affordably or easily replaced. The valuable materials within phones, such as gold, silver and copper, do not degrade as easily as these other parts and are often able to be extracted from recycled phones. Is there a design solution that allows the replacement of the easy-to-obsolete parts, while upholding the value and sanctity of the other materials? Many materials used to manufacture smartphones, such as indium tin oxide, are growing scarcer, as well as being exceptionally dangerous to mine. Greenspec notes that some experts say that we are reaching the capacity of Earth’s entire copper reserves as soon as 2025 (*Copper production & environmental impact*, n.d), which would hugely impact smartphone manufacturing and may be the reason some change is needed regarding recycling of devices.

This design for disassembly or modularity operates on the understanding of the inevitable obsolescence of things, and creates an interesting design challenge for smartphones. Abramson (2016, p.72) draws attention to the principles that guided Japanese architects in the throws of their consumerist society, and describes the "essential Japanese acceptance of evanescence" in regards to Buddhists ideas of cyclicity and traditions of Shinto temple construction. The Ise-Jingu Shinto shrine in Japan is disassembled every 20 years, and subsequently rebuilt, in a tradition dating back 1300 years (Nuwer, 2013). While this serves to uphold a tradition, it does raise interest regarding the material limitations associated with designing for disassembly and the obsolescence of material. The permanence of the materials within the smartphone is evidently not reflected in the time in which we own them, or even the duration of working life. Fairphone addresses this with their use of a plastic backing for their phones, which is a material consideration that allows for an almost retro sensation of popping the smartphone open to access the battery and other vitals. The permanence and luxury of the materials in the iPhone, conversely, fail to align with perceptions as to how long the device should last.

For all of the aforementioned regarding repair, modularity, and obsolescence, how much of smartphone obsolescence lies within a consumer’s desire or intention to upgrade their device periodically? Do consumers determine the lifespan and timescale of this obsolescence? According to Makov and Fitzpatrick (2021), the consumer’s interest in repair exponentially decreases over time, particularly after the 2 year ownership mark, and perceived obsolescence

plays a crucial role in determining smartphone lifespans. Perceived obsolescence is another way of describing obsolescence of desire, which lies within the consumer yearning for a newer item. Using the dataset of iPhone benchmarking, the pair determine that the performance of the device remains stable over time and does not deteriorate in the way that many of us seem to believe regardless. This gives credence to the idea that, ultimately, it is the consumer as opposed to manufacturer/designer who yields the ability to dictate the lifespan of smartphones. Makov & Fitzpatrick (2021) go on to suggest that consumer perceptions of their devices obsolescing are devised as a mental and emotional justification for their replacement, absconding us of guilt for over-consumption or wastefulness. In a rapidly evolving landscape of technological innovation, the ways in which consumers perceive their devices accelerates their obsolescence; perhaps our operating system is too old and no longer compatible with certain apps, or in the case of emerging AI technologies, there are new features utilising LLMs that require more processing power or newer models of phones. It can even be the case of rewarding oneself for any personal reason, so the purchase is justified. The research shows that for consumers there will always exist a justified reason to upgrade, leaving consumers as well as producers “complicit in an undeniably short-termist contemporary material culture” (Mickelthwaite, 2019, p.459). As surmised by Chapman (2005, p.9) in *Emotionally Durable Design Objects*, in reference to the 20th century origins of planned obsolescence, “consumers of the 1900s were not born wasteful, they were trained to be so by the sales-hungry teachings of a handful of industries bent on market domination”. The modern consumer is an evolution of the well trained consumer of the last decade, navigating a landscape with frequent opportunities for further consumption. In this respect, Fairphone cannot offer a suitable alternative to the obsolescence of iPhones due to consumer behaviours, as Fairphone cannot compete with the lux nor desirability of the iPhone, and this sustainability focus will only appeal to a particular type of consumer rather than spark a change in the face of convenience.

In the battle against indeterminacy, Fairphone are pledging 10 years of software update support for the Fairphone 5, which appears unorthodox in a landscape of diminishing (or enshittified) returns. This effectively makes the statement that Fairphone wants their model to be useful for 10 years, also offering a 5 year warranty as well as a modular design to enable user repairability. In many respects, this is actively against the general downward trend that Doctorow argues is symptomatic of our most widespread products, attempting to give consumers long term value through transparency.. Apple do not disclose how long they offer

support for each model of phone; but due to the new UK PTSI act of 2024, Apple (as well as others) are mandated to disclose the minimum length of support period, which for the iPhone 15 has been announced as a minimum of 5 years of support (*How Long Will My iPhone Be Supported?*, 2024). By always disclosing upfront the length of support for the device, Fairphone are again going against the typical trends of smartphone manufacturers, effectively providing guidance to the product lifespan and removing this vague indeterminacy. In some ways, this also removes the insidiousness of the term planned obsolescence in regards to the Fairphone 5, as there is now a more distinct timeframe on which to judge its performance and longevity.

The biggest concern about the Fairphone 5 longevity amongst reviewers is the performance of its processing unit over time, as well as the immediate performance handicaps it has in comparison to competitor phones at the same price. This raises important questions regarding the sacrifice of innovation in the combat of phone obsolescence. In order to have a smartphone that consumers can repair when appropriate, from an ethically mindful manufacturer, do consumers need to sacrifice the high performance they have grown accustomed to? This greatly impacts the viability of Fairphone as anything more than a token sustainable option, much smaller in comparison to phone conglomerates. As mentioned earlier when discussing material considerations, a plastic backing for a phone will feel dated to the typical consumer as it acts as a callback to the old Nokia phones, and just does not have the same superiority of the various metal and glass blends used by Apple and Samsung. When discussing the visual aesthetics of obsolescence in conjunction with desirability, materials play a huge role in the way we design things as shown by Abramson. Anything that visually or experientially ‘calls back’ to a time of inferior technology, such as a removable battery, may be perceived as outdated or obsolete despite its intention to be user friendly. Despite trying to bridge this gap between material and lifespan, Fairphone is fighting against a machine involving both consumer and corporation that operates on principles that have very quickly engrained themselves within the current zeitgeist of how we *should* be consuming smartphones. As Mickelthwaite (2019, p.461) notes, “there is little merit in aspiring to create a sustainable product if its user does not recognize and act on its potential to support sustainable behavior”, meaning that all of Fairphone’s effort to design with materiality and repairability at the forefront falls of deaf ears without a paradigm shift in general user thinking.

Chapter 5: Sustainable Consumption:

A Conscientious Convenient Future?

How can a common ground be found between the superficial nature of iPhone production and the comparatively primitive construction of the Fairphone 5, with the goal of championing sustainable consumption? It is difficult to say whether the focus should be applied towards the manufacturing process, the discardment/upgrade process, or the mindset of consumers, but all three have an impact when considering the obsolescence of the Fairphone 5 compared to conventional smartphone models. The ideas set out within *Cradle to Cradle* and others aim to detach audiences from the anthropocentrism of our current consumer habits and synchronise us better to nature, however they seem to fall close to an unrealistic utopia. In *Emotionally Durable Design*, Chapman describes this disconnect between a utopia, in which symbiosis between human and environment is valued over profit, and the “real world” we observe daily. The real world “invariably behaves as an impervious obstruction to both change and progress” (Chapman, 2019, p.164) due to the suppression of solutions that do not further economic growth. This is clearly observed within the smartphone industry, and players like Fairphone currently exist on the periphery of the realistic world of smartphone consumption, with great change needed for them to take the place of Apple or Samsung. The singularity of our real world and the “infinite number” (Chapman, 2019, p.166) of incorrect solutions acts as a huge obstacle for startup companies such as Fairphone to have the widespread impact they wish to have. The “growthist economy” (Pope, 2017, p.44) shuts out solutions that do not provide economic growth, which provides the breeding ground for the practices of planned obsolescence that have been discussed throughout this paper. In this sense, planned obsolescence is less of a capitalist Machiavellian plot (vis-à-vis the conspiracy by the Phoebus Cartel) and more of an inevitable consequence of a society where consumers are encouraged at every stage to consume, through a high-volume device which is increasingly difficult to live without.

Despite this somewhat bleak assertion of the impossibility of phone utopia, the emergence of a more sustainable methodology of design thinking may yet provide an abundance of solutions to the planned obsolescence of the smartphone industry. Mickelthwaite’s (2019) sustainable consumption model may provide some guidance as to the responsibility of both

consumer and corporation. Sustainable consumption is defined as “the use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the lifecycle, so as not to jeopardise the needs of future generations” (Mickelthwaite, 2019, p.461). When considering the arguments throughout this paper regarding the production and consumption of smartphones, current smartphone production does not align within this definition due to its toxic ecological impact. Fairphone, in its efforts to combat unsustainable design and planned obsolescence, adheres more closely to a sustainable consumption model, but remains a minority in the industry. According to Mickelthwaite (2019), the most plausible explanation for why an unsustainable model continues to be the most prevalent is convenience.

Are there ways to break the convenient conventions of planned obsolescence through design solutions? Fairphone is one of a very limited number of smartphone manufacturers experimenting with modularity within their designs, in an attempt to elongate the lives of our devices. In an article titled “*The Potential of Modular Product Design on Repair Behavior and User Experience - Evidence from the smartphone industry*” (Amend et al, 2022), researchers surmised that, although promising, modular product design is not alone enough to extend device lifespans. They argue that “well-designed repair instructions foster self-repair behaviour and positive experience” (Amend et al, 2022), highlighting the importance of the attractiveness of the repair instructions in the user experience. This ties with the theories of convenience, as a difficult to navigate repair process will only act as an obstacle for users, no matter the strength of the modular design. The paper describes this as the perceived self repairability, acting in tandem with modular design to increase user adoption of self repair (Amend et al, 2022). A satisfying user experience surrounding the accessibility of repair helps with the adoption of a more circular consumption process, and facilitates future repair willingness, providing scope for innovation. This suggests that there is still a lot to be done, whether it be Apple or Fairphone, when it comes to motivating users to engage in sustainable consumption of smartphones, and that planned obsolescence conventions are not the only problem.

Closing Summary:

Planned obsolescence is demonstrably a term of immense nuance within the contexts of production and consumption, and cannot be boiled down to usage in sensationalist headlines about how companies are plotting against the masses. The practices seen within the smartphone industry, such as parts pairing, the mining of conflict minerals and intentional obsolescence of function, are all products of a consumerist society that has tactically been developing since the 20th century, full of consumers who have been trained to operate within it. There are examples of planned obsolescence conventions within Apple, such as their frequent new releases, which act as a callback to the earliest inceptions of planned obsolescence in a growingly capitalist 1920s America.

The solution to eradicate planned obsolescence practices and conventions will be one that adopts a sustainable mindset towards the production of smartphone devices, taking into consideration the ecological impact of production and discardment, as well as emphasising the nuance of connection between user and device as opposed to promoting the short-term, high-volume relationship as we currently see. A focus on the experiential qualities of phone usage and obsolescence will be key, as there is a lot within consumer mindsets that contributes towards upholding planned obsolescence conventions. The word “sustainable” is what tethers these solutions to an unrealistic utopia, as “design for sustainability is design *against* consumerism” (Mickelthwaite, 2019, p.474), which would require a total paradigm shift given our position in a consumerist society. Capitalist society’s unfortunate reliance on economic principles makes this unlikely, and shows why Fairphone is a long way away from becoming a household name.

Fairphone is successful in its attempts to minimise its impact on communities and environments through its considered supply chain and emphasis on repair, but is unsuccessful in dethroning Apple due to the attitude of the consumer. Fairphone, in a vacuum, is likely successful in eliminating the conventions of planned obsolescence within its own product line, but inevitably fails at this stage to be anything more than a token option of honest sustainability, watching as other companies continue to churn revenue. The decision to provide 10 years of support for its flagship phone successfully eliminates the indeterminacy of phone lifespans within its own product line, but does not change the behaviour of

consumers as Makov observed, who become far more reluctant to repair their devices after 2 years in favour of a replacement. There still remains uncertainty as to the performance of Fairphone 5 devices when they reach the end of their 10 years which is impossible to comment on until it can be observed, but the issue of material quality still remains for Fairphone. The issue is less one of quality, and more the material associations consumers have become accustomed to within their smartphones, fostering an inevitable cycle of rapid obsolescence and the impossibility of open discussions surrounding material alternatives. This is also due to the closed nature of our world, as Chapman (2019) writes, and the ostracising of alternative solutions that do not maximise growth. In contrast to these small victories of Fairphone, Apple is successful in creating \$46 billion in revenue in 2024 Q4 alone, due to their ability to keep their product "competitive throughout the years, with new releases and updates" (Laricchia, 2024b); or in other words, by following the obsolescence conventions seen all the way back in General Motors in the 1920s.

In light of this, it is difficult to view smartphone obsolescence as the natural outcome of technological progress, though the complexity to which our phones have evolved is acting as an obstacle to eliminating rapid obsolescence. It is certainly easy to argue that the phenomenon is driven by market forces, and any solutions which threaten the profit margin are likely to be shunned. Fairphone is a miniscule company despite being one for over 10 years, and is the product of startup innovation, not profit maximisation. In their report for the Fairphone 2, they state that they are left with a paltry €9 of profit per phone, from a retail price of €525 (*Cost breakdown of the Fairphone 2*, no date). While their transparency is admirable, it highlights a significant deficiency regarding the long term progression of Fairphone to make any sort of impact on the market, given the needs of capitalism. There is no information for how much Apple makes in profit per iPhone, only speculation, however with a retail price of £799 for the iPhone 16 and their practice of not paying Chinese child labourers (Garside, 2013), it is likely to be more than the Fairphone 2.

The design against consumerism that Mickelthwaite advocates for seems to exist in opposition to the way in which modern smartphone releases operate, with a minimal amount of innovation between models due to the propensity for new releases. The growing impact that smartphone production has on our environment, in production and afterlife, creates an ethical dilemma within their consumption that makes the issue of planned obsolescence even more important. Within the Anthropocene, there exists a responsibility towards making

considered choices towards the over consumption of such a potent device, and (from an ethical standpoint) efforts should be made to elongate the lifespans of our phones rather than diminish them. Given that obsolescence of desire has been observed since last century, it feels unlikely that there will be a worldwide shift in consumer behaviours, until there exists a situation where smartphones cannot be manufactured in the way we know them now due to the extinction of finite resources such as copper. In this way, what this essay shows is that the processes of planned obsolescence are not a new phenomenon exclusive to smartphones, but a sustained approach to production and consumption, driven by market forces and accepted by consumers as a matter of convenience. It remains a monumental task, both financially and sociologically, for an outsider company such as Fairphone to make a noticeable impact on planned obsolescence, so lies the outside chance that one of the major market shareholder companies will reject their growthist principles in favour of advocating repair, modularity and permanence. In this way, Fairphone are unable to dismantle the conventions of planned obsolescence, despite their best efforts, fighting an unlikely fight against both profit and convenience.

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