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March 28 2025
Academic English

Designed to last or replace? Unpacking Apple's Product Evolution through Planned Obsolescence

Since 2007, Apple has introduced a new iPhone every year.¹ The current way consumer electronics are produced and consumed affects the environment negatively.² Apple's frequent product redesigns have sparked discussions regarding planned obsolescence and its impact on consumer behaviour. Critics argue that the consumer electronics giant intentionally persuades consumers to repurchase frequently.³⁻⁴ This marketing strategy dates back to 1932. Bernard London introduced planned obsolescence as an economic strategy to encourage consumerism and combat the economic depression.⁵ Although London introduced this idea, Brook Stevens became its most prominent advocate, famously defining it as "instilling in the buyer the desire to own something a little newer, a little better, a little sooner than is necessary." Planned obsolescence can be categorized into two categories. The first is functional obsolescence, where products are intentionally designed to have a limited lifespan. The second category is perceived obsolescence, also referred to as obsolescence of desirability, which occurs when consumers are encouraged to replace products due to fashion or aesthetic purposes, even when the product remains fully functional. This paper examines to what extent Apple's product design choices are shaped by planned obsolescence.

Apple's hardware design choices contribute to built-in obsolescence by making repairs difficult and encouraging consumers to purchase new devices. These design choices include the difficulty of replacing batteries and the use of proprietary screws. According to the analysis presented by Bisschop, Hendlin, and Jaspers, Apple is steering consumers toward the replacement of the device or consulting an authorized repair service by actively discouraging third-party repairs.⁶ The iPhone has been widely considered challenging to repair independently. An example is "error 53", a safety feature on the iPhone 6 that verifies whether the Touch ID sensor in an iPhone or iPad correctly corresponds with the device's other components.⁷ If a third party replaces the home button, the device displays error 53 and becomes obsolete.⁸ Another example provided

¹ Goodwin and Woolley. "Barriers to Device Longevity," 1.

² van den Berge, Magnier, Mugge "Sparking the Repair" 25.

³ Bisschop, Hendlin and Jaspers "Designed to Break" 273.

⁴ Taffel "Airpods" 445.

⁵ London, "Ending the Depression,".

⁶ BBC "Apple,". As mentioned by Bisschop, Hendlin and Jaspers "Designed to Break" 278.

⁷ Brignall, "Error 53,"

⁸ Ibid.

by Barros and Dimla is that repairing an iPhone battery can be quite complex. The website I-Fixit offers a 44-step guide that requires 15 different tools needed for a successful repair of the iPhone 11.⁹ Even if the repair is successful, an error message will appear, which disables the battery capacity indicator and other functions, such as the Face ID reader.¹⁰

Apple devices rely on rechargeable lithium-ion batteries that degrade over time, combined with the limited repairability of these batteries, this can be linked to planned obsolescence. Taffel argues that battery degradation is an inevitable issue with lithium-ion technology.¹¹ Lithium-ion batteries are rechargeable, yet not endlessly. Typically, lithium-ion batteries degrade by around 20% after 300–500 charge cycles.¹² In the past decades, consumer electronics were designed with batteries that users could easily replace.¹³ However, modern designs have shifted towards sealed battery compartments.¹⁴ As with most of Apple's products, AirPods also rely on lithium-ion batteries. The battery of the first released AirPods by Apple has been reported to decrease in capacity rapidly. While Apple promises a listening time of five hours, some AirPods have shown a performance capacity of just one hour after being used for 18 months¹⁵⁻¹⁶ Replacing the batteries of AirPods is not possible, as trying to break open the earbuds would result in damaging the hardware.¹⁷ Because of the irreparability of AirPods, Taffel argues that these modern design choices result in devices' lifespans being dictated by lithium-ion batteries, which is a form of planned obsolescence.¹⁸ Barros aligns with Taffel's viewpoint and notes that the use of proprietary screws makes repairing Apple devices by a third party more complicated and not accessible to the average user.¹⁹ On the other side, Apple uses mechanical fasteners instead of glue for certain components, enhancing the iPhone's repairability.²⁰

⁹ Suovanen, Keulemans, Gregg "iPhone 11,". As mentioned by Barros and Dimla, "Planned obsolescence," 1612.

¹⁰ Barros and Dimla, "Planned obsolescence," 1612.

¹¹ Taffel "Airpods" 445.

¹² Buchmann "BU-802". As mentioned by Taffel, "Airpods" 445.

¹³ Taffel "Airpods" 445.

¹⁴ Ibid.

¹⁵ Apple, "AirPods 1 - Tech Specs".

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Barros and Dimla, "Planned obsolescence," 1612.

²⁰ Ibid.

Perceived obsolescence, driven by aesthetic and status-based marketing strategies, plays a crucial role in Apple's product releases, pushing consumers to upgrade even when their devices are still operational. According to Bisschop, Hendlin, and Jaspers, electronic companies such as Apple have copied the working of the fast fashion industry by encouraging consumers to replace a product that is still functioning because of style preferences.²¹ Barros and Dimla refer to this concept as “obsolescence of desirability” but maintain a similar viewpoint.²² For instance, Barros and Dimla highlight that Nokia, rather than prioritizing technological advancements, concentrated on fashion-oriented collections launched between 2004 and 2006.²³ Nokia aimed to design new phones that aligned with mainstream aesthetics. This emphasizes that style trends are also important alongside constant product innovation and suggests that consumers can be encouraged to purchase items they may not need to replace if they have a strong style preference.

The concept of planned obsolescence suggests that companies, including Apple, intentionally design products to fail within a short timeframe, thereby necessitating new purchases and encouraging consumers to replace devices rather than repair them. Design choices -such as difficult battery replacements due to hardware design and software issues such as error 53, proprietary screws, and restrictions on third-party repairs- limit repairability and encourage new purchases. The reliance on lithium-ion batteries, which degrade over time and are often non-replaceable, further reduces product lifespans. Additionally, Apple's marketing strategies promote aesthetic and status-driven obsolescence, pushing consumers to upgrade even when their devices are still functional. However, this criticism overlooks the complexity of consumer behaviour and the role of technological advancement in influencing product lifecycles. This paper did not address consumer behaviour, and a broader understanding of market dynamics and consumer preferences is necessary. While Apple has taken some steps to improve repairability, such as using mechanical fasteners instead of glue in certain components, its broader business model continues to prioritize frequent device replacement. This paper raises critical questions regarding sustainability, consumer rights, and the long-

²¹ Bisschop, Hendlin and Jaspers “Designed to Break” 274.

²² Barros and Dimla, “Planned obsolescence,” 1609.

²³ Barros and Dimla, “Planned obsolescence,” 1611.

term impact of planned obsolescence. Acknowledging these aspects can lead to more discussions about sustainable design and responsible consumption.

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