

# **An Analysis of Apple's "Batterygate" Controversy using Kantian Duty Ethics**

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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## **Introduction**

In early 2017, Apple released iOS 10.2.1, an update to the existing operating system for iPhones. The update included a feature to limit the iPhone's processing speed in order to prevent sudden spikes in power demands that were causing many iPhones to shut down unexpectedly (an issue many users called, "the 30% bug"). However, Apple failed to tell anyone about the feature, allowing the public to figure it out on their own about a year later. This led to a sizable public outcry (many labeling the controversy, "Batterygate"), and led to an eventual public apology from Apple with reparations.

The iOS 10.2.1 update itself, given its abnormal publicity, has been examined by scholars from a technical standpoint. Additionally, many scholars have examined the case around the update from a legal standpoint, with the goal of determining whether or not the actions of Apple constituted planned obsolescence (i.e. whether or not Apple intentionally slowed down older iPhones to convince users of those devices to upgrade to newer iPhone models). These approaches fail to consider the ethics of Apple's actions, regardless of Apple's intentions (which remain unclear). An objective ethical analysis of Apple's actions alone could reveal important insights about the ethics of the updating software, an important practice of software maintenance and security. The analysis may also reveal whether Apple still acted unethically even if planned obsolescence is removed from the equation.

In order to provide an objective ethical analysis of Apple's actions during the release of iOS 10.2.1, I will use Kantian duty ethics to analyze the morality of these actions. Using Kant's framework on the situation as a whole, I argue that Apple committed two actions that violated the Categorical Imperative. First, Apple altered major software functionality without notifying

users, demonstrating a serious lack of transparency. Second, Apple continued to withhold information about the update from customers in 2017, creating a misleading market situation. I will show how Apple committed these actions and explain how each action violates both formulations of the Categorical Imperative.

## **Background**

The public deduced the true functionality of iOS 10.2.1 on their own. On December 9, 2017 (nearly a year after the update was released on January 23), a Reddit post by user Tyler Barney claimed that replacing his iPhone's battery nearly doubled the phone's processing speed. Barney measured this effect using Geekbench, a popular app used to benchmark processor speeds (Barney, 2017). This prompted Geekbench to publish benchmark data from thousands of its users across different versions of iOS, showing how updates 10.2.1 and 11.2.0 affected the performance of iPhone 6 and iPhone 7 models (Poole, 2017). Ten days later, Apple posted an apology on their website in which they explained the functionality of iOS 10.2.1, denied intentions of planned obsolescence, offered a discount on battery replacements, and announced the development of more transparent iPhone battery statistics as well as the ability for users to disable the performance management feature (Apple Inc, 2017).

## **Literature Review**

While scholars seem to understand the technical aspects of both iOS 10.2.1 and the battery issues it sought to fix, and have a wealth of opinions concerning whether or not it constituted planned obsolescence, scholars have not yet analyzed the situation from an objective ethical standpoint.

In the IEEE article, *Li-ion Battery Reliability – A Case Study of the Apple iPhone*, Sun et al. explain the technical reasons behind the battery problems of multiple iPhone models. While Apple claimed that the unexpected shutdowns of 2016 were caused by aging batteries (and, for one particular batch, manufacturing defects), Y. Sun et al. argue that the problems showed up much too quickly for ordinary aging to be the main cause. Rather, they explain how battery aging can be expedited by apps with occasional high power demands, such as Snapchat. These apps can cause the battery to discharge too quickly, resulting in a situation known as “overcurrent.” Sun et al. show how overcurrent can have both short-term and long-term effects on the battery’s performance, ultimately increasing the risk of unexpected shutdowns. They explain how Apple’s software fix was to essentially cap these discharge rates, which consequently lowered the performance of more intensive apps (Sun, Kong, Khan, & Pecht, 2019). Overall, the article provides an important background on Apple’s situation at the time of the update, but it is primarily an analysis of the technical problem, rather than the ethics of Apple’s decision. They do discount Apple’s lack of honesty with the update and proclaim that “slowing a customer’s apps because of a design or manufacturing problem is not an appropriate solution for most customers,” but a more in-depth ethical analysis may be beneficial to strengthen this last point.

An article in the *Journal of European Consumer and Market Law*, along with multiple class-action lawsuits, examines the situation in the realm of planned obsolescence. A. De Franceschi argues that consumers were not notified about the potential inconveniences of updating to iOS 10.2.1, and were given “little and belated” advice on how to fix their devices. Franceschi also mentions how Apple continuously asks users to upgrade, with no easy option to roll back. After updating, consumers were not well-informed that they could replace their

batteries instead of replacing their phones to improve performance, ultimately leading many consumers to unnecessarily upgrade their devices (De Franceschi, 2018). While Franceschi offers important insights on the situation from the consumer perspective, the article is primarily an argument against planned obsolescence. As mentioned in the introduction, if I instead focus on the raw actions of Apple (i.e. assuming the whole situation was not a ploy to sell more iPhones), this may bring about important insights regarding the ethics of software updates.

While Apple has received a lot of scrutiny for its software update, both in the technical and legal realms, there is actually little research on the ethics of updating software. There is certainly a wealth of research on the broader topic of ethics in software development, but the ethics of developing an update to existing software, effectively making changes to technologies that users already rely on, could prove to be a special case.

### **Conceptual Framework**

Although the internet provides a wealth of opinionated statements concerning the “Batterygate” situation, there is little public information about the specific actors within Apple that orchestrated the release of iOS 10.2.1. Consequently, little information exists on these actors’ true intentions, save Apple’s claims of good will. My analysis of the situation draws on Kantian duty ethics, which allows me to analyze Apple’s raw actions according to a relatively strict ethical framework. This may help provide a more objective view to the conversation, focusing on Apple’s actions without speculation on its intentions.

Duty ethics is a class of ethical approaches that defines an action as moral if it is in agreement with a certain moral rule or set of moral rules (van de Poel & Royakkers, 2011). The most widely-known duty ethics system was developed by Immanuel Kant. Kant believed that

humans are autonomous, rational beings with the ability to determine what is morally right through reason. He provided a universal moral principle known as the “Categorical Imperative,” which can serve as a sort of rational algorithm to determine if any action is morally right (van de Poel & Royakkers, 2011). Kant described this monistic moral rule under two formulations.

First, the Universality Principle defines an action as moral if the general underlying rule (or “maxim”) of that action could be reasonably applied as a universal moral law (van de Poel & Royakkers, 2011). For instance, breaking a promise violates the Categorical Imperative under the Universality Principle because the idea of a society in which it is morally right to break a promise is not reasonable. (There also exists a logical contradiction. In this hypothetical society, promises would have no meaning, so rational people would never trust promises in the first place.)

Second, the Reciprocity Principle defines an action as immoral if it disrespects other humans’ existence as rational beings with their own individual goals, effectively using them as a mere means to accomplish one’s personal, selfish goals (van de Poel & Royakkers, 2011). For instance, breaking a promise would violate the Categorical Imperative under the Reciprocity Principle because this action would be misleading the rationality of those who trusted the promise. (If they had known that the promise was worthless, then they, as rational beings with their own personal goals, would not have trusted the promise in the first place.)

In my analysis of the iOS 10.2.1 situation, I will explain how Apple committed two actions that seem morally questionable, and then run each action through both formulations of the Categorical Imperative to determine if the action was ethical.

## **Analysis**

During the release of iOS 10.2.1 and in the following year, I argue that Apple committed two actions that were unethical according to Kantian duty ethics. First, the update itself modified major functionality of the iPhone without notifying users, demonstrating a lack of transparency with users. Second, Apple continued to omit details about the update in the following year, causing all iPhone sales to take place in a misleading marketplace. I will show how Apple committed these acts, and explain how each act violated Kant's Categorical Imperative

### Lack of Transparency

Apple pushed a major software update to consumers without telling them what it did, changing the existing functionality of their devices without their knowledge.

As with all iOS updates, users were presented with an update screen to detail what the update changes:



*Figure 1: Screenshot of the iOS 10.2.1 Update Screen*

Most iOS updates, particularly major ones, contain much longer messages on this screen to detail to users what the new update encompasses. The update screen for iOS 10.2.1, however, contained a very generic message, suggesting to users that this was a relatively minor update (Horowitz, 2017). This update screen mentions nothing about the major performance management feature contained within those 67.4 megabytes.

Two online conversations on Forbes.com, posted shortly after the update was released in January 2017, serve as further evidence that users were unaware of the true purpose of the update. First, in the words of Amit Chowdhry, “The description of the update simply says that it includes bug fixes and security improvements for the iPhone or iPad, so it's easy to tell that this is a minor update” (Chowdhry, 2017). This statement supports that many users interpreted the paucity of update details as evidence of a minor update. Secondly, another article on the same website (entitled, “Apple iOS 10.2.1 Ignores 30% Battery Bug”) purposely includes multiple posts from users on Twitter to show how many users were outraged that the update did not seem to affect the functionality of the battery (which was, in fact, the main purpose of the update) (Kelly, 2017). This article suggests that users were completely unaware that the update related to the battery, as they were vocally angry about this very fact.

As a side note, Apple did make a direct statement to TechCrunch.com in February 2017 that the update was intended to fix the unexpected shutdown issue. However, they mentioned nothing about how the update accomplished this. The TechCrunch article presenting the statement vaguely explains that unexpected shutdowns were reduced by “whatever tweaks Apple made to its power management system,” further suggesting that even the most informed of users



were unaware that the update affected the performance of the iPhone's CPU and GPU (Panzarino, 2017).

Therefore, Apple released the iOS 10.2.1 update without effectively communicating to users that the update capped processing performance to reduce unexpected shutdowns. I argue that this action was unethical according to Kantian Ethics because it violated both formulations of the Categorical Imperative.

To test whether the action violated the Universality Principle, one can imagine a society in which it is universally acceptable for producers of software to release any update without communicating to users how the update affects the existing software. I argue that this hypothetical society is not reasonable. Updates to software affect the existing functionality of technologies that people already rely on. If all updates could be released without any description of the changes they contain, then rational users would probably not trust software updates on principle, having no idea how the updates could affect their technologies, and thus having no idea if updating is actually within their best interest. Perhaps users would delay updating their software until other users have investigated the potential effects of the update on test devices, or perhaps users would refuse to update altogether. This would delay or prevent the deployment of important security updates, prolonging the vulnerability of skeptical users without their knowledge. All in all, the action violates the Universality Principle because the action's maxim (that it is ok to release a software update without communicating what that update entails) is not reasonably universalizable.

The action also violates the Reciprocity Principle. If choosing whether or not to update is considered a decision for rational users to make for themselves, then withholding information

about what the update does can be considered misleading the rationalities of the users. If the producer of a software update truly respects its users as rational human beings with their own interests and goals, then presumably the producer would be willing to clearly communicate to its users what the update does, as well as indicate any benefits or tradeoffs of updating to the newer version. By failing to communicate to users that iOS 10.2.1 could reduce the performance of their iPhones, Apple effectively used its users not as an end, but as a mere means to accomplish its own goals (which remain unclear).

The above argument supports that Apple's lack of transparency about update was unethical by Kantian duty ethics. Of course, some readers may argue that the converse maxim, that all changes to software must be well-documented and communicated, is also not reasonably universalizable. iOS is primarily a closed-source software, which means its source code is proprietary. Too much transparency would undermine Apple's goals and interests as a closed-source developer, such as (debatably) increased security and the protection of intellectual property. Furthermore, documenting every single change to the operating system would not be feasible for Apple's engineers, and too much documentation could hinder communication with less-technical users. I agree that there is a limit to acceptable levels of documentation. Perhaps, as a TechCrunch article published after Apple's apology states, "there is a balance to be struck between giving people too much information and not enough information" (Panzarino, 2017). Yet, I still do not think this argument shows that Apple's action was ethical by Kantian ethics. Although the acceptable level of transparency may not be absolute, I think Apple clearly chose the wrong balance, just based on the level of public outcry online, the number of class-action lawsuits, and Apple's public apology. But since duty ethics operates on absolute moral norms,

perhaps a broader maxim could be used to make a more Kantian verdict. The first principle of the ACM / IEEE joint code of ethics states that, “Software engineers shall act consistently with the public interest” (IEEE Computer Society, 1999). (I will allow the reader to run this through the Categorical Imperative.) This maxim supports the notion that users should at least be notified about major changes in functionality before updating, so they can decide whether updating is consistent with their interests. The iOS 10.2.1 update affected the overall performance of the entire iPhone as a system, without telling users anything about it. I argue that this was clearly a major change that users should have been notified about, at least partially, and that the omission of information was inconsistent with public interest. Thus, in light of broader moral norms, I stand with my argument that Apple’s action was unethical by Kantian duty ethics.

### Misleading Market Situation

Throughout most of 2017, between the release of iOS 10.2.1 and the reveal of the update’s true functionality, Apple sold iPhones to customers that were unaware of the performance management feature. This created a market situation for most of 2017 in which potentially important information was withheld from consumers.

The existence of this market condition can be proven by examining the timeline of events described in the background section.

Event	Date
iOS 10.2.1 is released	January 23, 2017
Reddit post calls attention to update	December 9, 2017
Geekbench publishes benchmark data supporting the Reddit post	December 18, 2017
Apple publicly apologizes	December 28, 2017

*Figure 2: Timeline of the “Batterygate” Controversy*

According to the company’s annual 10-K report in 2018, Apple sold 216.756 million iPhones in 2017 (Apple Inc., 2018). Clearly, iPhones were purchased in the one-year period in which consumers were unaware of the performance management feature released with iOS 10.2.1.

Furthermore, multiple court cases argue that Apple’s customers lacked important information when making purchasing decisions in 2017, specifically with regards to how this may have caused consumers affected by the iOS update to unnecessarily purchase newer iPhones. In the recently-concluded French lawsuit that successfully fined Apple \$27 million, the Directorate General for Competition, Consumption and Fraud Prevention (DGCCRF) further supports the previous section’s claims that consumers were unaware that the iOS updates (also including iOS 11.2) had the ability to lower their iPhones’ performance levels. They go on to say that this lack of transparency “constituted a misleading commercial practice by omission” (Gallagher, 2020). This further supports the notion that the omission of details about the update also led to a commercial environment in which consumers lacked knowledge that was relevant to their purchasing decisions.

The Geekbench article mentioned in the background section included a statement at the end that explained how the functionality of the performance management feature itself, without

an available explanation, may have been misleading to a typical user about the health of their device's processing hardware. The article states that users only expected CPU performance to be purposefully lowered if their iPhones were in low-power mode (which activates with a notification to the user). However, when performance was limited without notification, many users may have believed that the reduced performance was caused by their aging phones (rather than their aging batteries in combination with the 10.2.1 feature), causing them to replace their whole iPhones when really all they needed was to replace their batteries (Poole, 2017). Overall, the performance management feature itself, without an explanation from Apple, painted a misleading picture of the iPhone's hardware as something that ages over time, when in reality it is lithium ion batteries that age over time. This information may have been important to some of the customers that purchased iPhones in 2017, particularly (as many argue) those who purchased iPhones in order to upgrade from devices impacted by iOS 10.2.1.

Therefore, it can be concluded that the market situation present throughout 2017 was misleading due to the omission of relevant details about the iPhone as a product. I argue that this omission of details alone, regardless of Apple's intention, was unethical by Kantian Ethics. I will explain how this action violated both formulations of the Categorical Imperative.

To test whether the omission of details about iPhones sold in 2017 violated the Universality Principle, it may be tempting to simply imagine a society in which it is universally acceptable for all producers to sell products while leaving out important details about those products. However, some may chuckle that this is, in fact, the current state of society, and that the free market exists to discourage such practices (along with some formal regulations). Instead, perhaps a broader maxim can be examined here. Selling products in a misleading way is a form

of breaking trust, as consumers entrust that the products work as advertised when reasoning about whether they want to purchase the products. The breaking of trust classically violates the Universality Principle by logical contradiction: If it was universally acceptable for people to break others' trust, then rational beings would not trust each other, and thus there would be no trust to break in the first place. Therefore, since the underlying maxim of Apple's action of creating a misleading market situation was that breaking trust is acceptable, and since this maxim is not reasonably universalizable, the action violates the Categorical Imperative under the Universality Principle.

As mentioned earlier, the Reciprocity Principle states that misleading the rationality of others for one's own, personal goals is unethical. Without a change in scope, this is exactly what Apple did. In 2017, Apple sold iPhones to consumers, who were rational human beings that made decisions to purchase those iPhones. Behind the scenes, Apple was withholding information that very well may have been relevant to those consumers in making their decisions. Perhaps some of those customers would not have purchased those iPhones if they had known that the phones contained a performance management feature, if that kind of feature was not among their technological preferences. Or, perhaps they would not have been interested in a platform whose software applications commonly demand more power than its battery can sustainably supply. Or, perhaps they would not have been interested in purchasing a device from a company that releases major performance-altering updates without the option to opt-out. If Apple truly respected its customers as rational human beings with their own goals and interests, then Apple would have provided these additional details so the customers would have as much knowledge as possible before deciding whether a new iPhone was something they truly desired

in 2017. Therefore, Apple's failure to do so violated the Reciprocity Principle, effectively failing to treat its customers as an end.

## **Conclusion**

Using Kantian duty ethics, I have argued that Apple's actions during the release of iOS 10.2.1 and in the year following were unethical. Apple's alteration of major functionality without notifying users demonstrated a lack of transparency, and its continued omission of information in 2017 maintained a misleading image of the iPhone in the marketplace. I have argued that both of these actions violated both formulations of Kant's Categorical Imperative. This analysis effectively shows that Apple still acted unethically even if the common accusations of planned obsolescence are removed from the equation.

Software maintenance is often cited as the most important stage of software engineering. As the stage primarily focuses on making changes to technologies that users have already come to understand and rely upon, it requires a different set of ethical considerations. Increasing respect for the interests of the rational human beings at stake may allow engineers to maintain software in a way that minimizes harm.

Word Count: 3795

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