

I am studying the manufacturing, design, and testing processes of Samsung's Galaxy Note 7 that lead to critical battery failure because I want to determine how Samsung failed their duty of care towards consumers in order to help smartphone engineers and managers understand the important role that care ethics plays in the manufacturing, designing, testing, and release phases of a product's life cycle.

Analyzing the Samsung Galaxy Note 7 Using Care Ethics

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By

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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 August 2016, Samsung released the faulty Galaxy Note 7 smartphone which ultimately led to at least 26 injured users and 55 reported counts of property damage. Investigation into the incidents revealed that battery manufacturing issues caused the negative and positive terminals of the battery to connect, causing a short circuit which led to thermal runaway and dangerous explosions (Yun, 2018). Some victims of the explosions also suffered from respiratory ailments due to the smoke created from the exploding lithium-ion batteries. After the phone was discontinued in October 2016, many scholars began to research the technical causes of the explosions in order to prevent such an event from happening again.

Scholarly work on the topic has demonstrated the need for stricter battery regulation and testing procedures in a world where engineering compromises are being made in order to increase product performance (Lain, 2018). Despite the Note 7's technical presence in literature, there is little discussion on the morality of Samsung as an agent of care to its user. While media outlets and news journals reported on Samsung's ethical shortcomings in the manufacturing and recall phases of the phone's life-cycle, the topic wasn't discussed in academia. I cannot discern why this is the case, but the topic, however, has much ethical valence and offers students an opportunity to see the effects of engineering malpractice in a real world case study.

I will examine the actions of Samsung through the lens of the ethical framework of care ethics to demonstrate how Samsung failed their duty to be moral agents of care due to their actions during the Note 7 life-cycle. To elaborate, I will prove this claim by illustrating how Samsung had a duty of care to its users but lacked the attentiveness, responsibility, competence, and responsiveness to do so. In my argument, I will put responsibility on the corporation as a whole rather than any single individual, which is commonly known as collective responsibility. I

will do so to highlight the difficulties of holding an individual responsible while necessary to hold the corporation liable.

Background

The Galaxy Note 7 was developed by Samsung and released in August of 2016 on a truncated production schedule in order to release before the competing iPhone 7. A week after release, the first battery explosions were reported in South Korea, and by early September, the Consumer Product Safety Commission (CPSC) recalled all Note 7s and advised users to shut down the devices and trade-in for replacements whose batteries were manufactured by a new supplier. However, Samsung failed to notice a crucial welding error in these replacements that were also reported to explode. The explosions ultimately caused at least 26 injuries and 55 counts of property damage. On October of 2016, Samsung issued the second recall and discontinuation of the smartphone entirely (Golson, 2016).

Literature Review

While many scholars have examined the root causes of the Galaxy Note 7 battery failure, the presence of in-depth ethical analysis into Samsung's actions to resolve the problem is hard to find. In current scholarly literature, the focus is put on attributing manufacturing decisions and Samsung's abnormal testing choices to the failure of the Note 7. However, these scholars neglect to make any moral judgments regarding the corporation nor do they call into question Samsung's ability to be a moral agent of care.

Melanie Loveridge and colleagues at Warwick University provide a detailed report on the safety of Lithium-ion batteries and how Samsung's manufacturing process compromised their integrity. Ultimately, they concluded that poor insulation between the battery terminals and a lack of room to safely accommodate the battery were the root cause of the Note 7 explosions.

Loveridge then goes on to discuss how these manufacturing flaws led to a short circuit within the battery that caused internal temperatures to read 220°C before combusting. This is then followed by an in-depth demonstration on several testing techniques and their efficacy in detecting failure in Lithium-ion batteries (Loveridge et. al, 2018). While Loveridge and her colleagues highlight Samsung's manufacturing errors, there is no judgement of the morality of the company on their questionable manufacturing decisions.

In *Managers and the Legal Environment*, Constance Bagley also discusses Samsung's manufacturing processes while also discussing their aggressive design decisions, stating that they are the two primary causes of the device's failure. In the case of manufacturing, it was revealed by Samsung officials that the Note 7 production was accelerated in order to release before Apple's iPhone 7 and other rising competitor products. As for the design of the phone, Samsung opted for an exceptionally thin separator in its battery which can cause fires in the event of breakdown or excessive external pressure. Bagley notes that SolidEnergy Systems and UL (formerly Underwriters Laboratories), two battery and safety companies, warned Samsung of the risks during production but were not successful in getting them to reconsider. She follows this analysis with a discussion of the efficacy of Samsung's recall strategy and public reception to the events (Bagley, 2019). While Bagley does discuss the ill-advised decisions Samsung made in design and manufacturing, she does not provide any judgment of the morality of the company.

While the existing literature certainly provides a lot to reflect on about battery design and large scale decision making, there is also a lot to learn from analyzing Samsung's business ethics in order to mitigate the odds of such an event happening again. As could be seen from the previous research, all analysis terminates after examining the tangible causes of the problem and fail to cast moral judgment on the corporation for enabling poor engineering behavior. In this

paper I will focus my analysis on the actions taken by Samsung throughout the design, production, and recall phases to demonstrate their failure of being moral caregivers. With this, I will highlight the moral responsibility that corporations have to the public.

Conceptual Framework

My analysis of Samsung's actions regarding the Note 7 draws on the theory of care ethics, which allows me to break down the relationships and duty of care that Samsung owes its stakeholders.

Inspired by the work of Carol Gilligan, care ethics states that morality is not based upon predefined, general moral principles but instead is formulated through roles and obligations present in our relationships with others (Van de Poel & Royakkers, 2011). Joan Tronto, a prominent care ethics researcher, believes care is defined not as a virtue nor a disposition, but as a practice through which humans maintain and improve the world they live in (Sander-Staudt, n.d.). Care ethics focuses attention on the importance to recognize the vulnerability and dependence that exist within the different types of relationships that we as humans have. This is especially important within the context of asymmetrical relationships like parent-child or doctor-patient, where care may be uneven, perhaps even one way. Our understanding of the role we play in a relationship dictate both the degree of care we can expect from one another and whether we should take them into account when determining our actions (Van de Poel & Royakkers, 2011). This understanding of relationships and recognition of dependence are critical to living morally through the lens of care ethics.

While Joan Tronto's definition of care as a practice is broad, she has identified four sub-elements of care that elucidate the virtues required to provide adequate care. The sub-elements she uses are: attentiveness, responsibility, competence, and responsiveness (Sander-Staudt, n.d.).

Tronto defines attentiveness as a proclivity to identify that a need exists and responsibility as a willingness to respond and take care of the need. The notion of responsibility in Tronto's definition of care focuses primarily on an agent of care as a single individual. When this agent is no longer one person but instead a group or corporation, collective responsibility must be considered. In cases with complex agents of care where responsibility may not fall to any one individual, collective responsibility states that the group can be held morally responsible while no single individual can be (Smiley, 2017). The third sub-element, competence, is defined as the skill of providing effective and thoughtful care to the agent in need. Finally, responsiveness forces care agents to consider the perspective of others in the relationship and to recognize the possibility of abuse in the care being provided. Though Tronto's definition of care and the four virtues can help understand the practice of care, it is important to note that these are tools that cannot provide any moral judgments without first integrating them into the social contexts of our relationships (Van de Poel & Royakkers, 2011).

For the purposes of this paper, I will examine the case of Samsung's Galaxy Note 7 through the contexts of care ethics by demonstrating the relationship between Samsung and its stakeholders. I will then use attentiveness, collective responsibility, competence, and responsiveness as metrics to measure Samsung's neglect to act as moral agents in regards to their duty of care.

Analysis

When Samsung's Galaxy Note 7s began to explode in close proximity to consumers, they failed to deliver proper care to their users. One of Samsung's business principles states that they care human health and safety by observing "global standards" and "take every precaution not to supply products and services that could harm human health and safety," however their actions

call into question their ability to uphold these values (Samsung, n.d.). From high risk design and rushed production to questionable product testing and poor recall management, their apparent inability to follow these principles is demonstrated at every point in the Note 7's life-cycle. Furthermore, Samsung's responsibility as an influential corporation to maintain and improve the world that their users live in directly matches Tronto's definition of care; this fact allows the use of care ethics as a lens to examine the case of the Note 7. Through this definition, it becomes clear that Samsung has failed to exhibit the four qualities that a moral caregiver must have: attentiveness, competence, responsibility, and responsiveness. Samsung's failure to uphold these virtues makes them an ineffective agent of care, and the following sections will display further evidence to highlight this fact.

Attentiveness and Competence

In Joan Tronto's approach to care ethics, attentiveness is the proclivity to become aware of the needs of individuals around us. To do so requires shifting focus from ourselves to those around us. However, this can be difficult because it requires that the caregiver put aside their personal plans in order to be attentive of others. Competence is the value that ensures the caregiver is effectively performing their duties in their relationship of care (Sander-Staudt, 2017).. Competence is crucial in this context because it's what separates poor and potentially damaging care from effective and impactful care. The inability to be an attentive and competent caregiver fails Tronto's definition of care ethics; this failure can be highlighted in the case of the Note 7, however it is not only the technical failures but also the way Samsung handled the explosion cases and recalls that demonstrate these shortcomings.

A cursory glance of Samsung's actions in the time after the phone was released to the public paints a picture in which they were both attentive and competent. Upon hearing reports of

exploding phones in late August, Samsung delayed shipments and prepared a recall that would take effect two weeks later with users able to receive replacement Note 7s that were manufactured by a different company and were believed to be safe (Gibbs, 2016). Once those replacement phones began to show similar explosive behavior, Samsung ceased production of all Note 7 phones and officially recalled them a second time in early October in the interest of consumer safety. Within a month-and-a-half time, Samsung released, recalled, replaced, and recalled once more all in the efforts to provide customers a safe product. From a birds-eye-view perspective, Samsung met the requirements of both attentiveness and competence. Their ability to acknowledge the reports of exploding smartphones and realizing that actions must be taken to resolve the situation demonstrates attentiveness since Samsung put the needs of their consumers ahead of the large cost both in time and money associated with resolving the problem. Furthermore, Samsung's testing and recalling of the Note 7 in an effort to maximize user safety shows that Samsung exhibits competence by using their logistical planning skills to generate a plan to keep customers safe.

Although Samsung has shown that they are capable of being competent and attentive, the specifics of the Note 7's design and manufacturing process highlights a situation in which they failed to act competently and attentively. In an attempt to gain market share over their competitors, Samsung decided to accelerate the Note 7 manufacturing timetable in order to release before the iPhone 7 and other competitor products. Furthermore, in an attempt to increase battery life performance, Samsung had also settled on a questionably thin separator responsible for preventing the two electrodes of the battery from touching, which results in fires when broken down. Paul Mozur with *The New York Times* interviewed several officials from Samsung and battery safety companies and stated that "Samsung's choice to push the limits of battery

technology left little safety margin in the event of a problem ... and in addition to the design flaws, Samsung and outside experts said manufacturing problems were often directly to blame” (Mozur, 2017). The statement reveals that Samsung’s rushed manufacturing process lead to sloppy production and thus compromised the safety and integrity of the Note 7. Additionally, the design of the battery separator has served to worsen an already compromised device and demonstrates how safety was not a priority for Samsung when considering design. In choosing such a risky battery design solely for the purpose of increasing performance demonstrates that their apparent attentiveness in recalling the smartphones must be discredited. Their failure to design with their consumers in mind illustrates how Samsung put their own self-interest above the interests of their consumers, going against the attentive element of care.

Samsung also failed to act competently in the context of care ethics as can be seen through these actions. They failed to provide successful care due to their aggressive production and questionable design decisions that ultimately compromised the safety and integrity of the Galaxy Note 7. An ethically competent engineering staff would realize the potential hazards of both an accelerated production schedule and a thin battery separator design and would only green-light the decision after extensive testing to ensure the integrity of the Smartphone was not compromised. Samsung’s failure to make safe decisions in the case of the Note 7 illustrates a disastrous oversight on their end. The consequences of their failure become apparent in the events that transpired after the release of the Note 7, where 26 consumers were either burned or left with moderate upper-respiratory problems due to the explosive phones (Kastrenakes, 2016). These incompetent and inattentive decisions on Samsung’s part highlight the need to view their actions under an ethical framework such as care ethics. By demonstrating Samsung’s failure to

satisfy the attentive and competence principles of Joan Tronto's care ethics approach, it can be seen that they are morally at fault in this situation.

So far I have been claiming that Samsung's actions during the manufacturing and design process have been unethical through the lens of care ethics, however, some scholars may argue that Samsung's was acting ethically. Some business ethicists view the case through the lens of individualism, focusing specifically on management's design decisions and how Samsung's actions were not unethical because "any action taken without considering profit is stealing from the owners of the company" (Unknown, 2016). They argue that the manufacturing and design regulations were to blame and that the employees were simply acting in the best interest of the corporation, thus Samsung should not be labeled as unethical since both their design and manufacturing processes followed regulation. However, this argument doesn't hold up in light of care ethics as it demonstrates management's severe lack of attentiveness. Evaluating the ethicality of Samsung's management purely from a revenue standpoint completely ignores the corporation's relationship with its consumers and provides incentives to exploit weak regulations in order to maximize income.

Collective Responsibility and Responsiveness

Keeping Samsung's design and production decisions in mind from the previous section, they also lacked responsiveness, Joan Tronto's fourth element of care, which is stated as the ability to realize the state of potential abuse for others in a relationship of care. Smartphones have become an integral part of modern society, and users put a lot of trust in companies to manufacture safe devices for public use. Given that Samsung violated this trust through their poor production and design decisions, they lacked responsiveness towards the vulnerability of their users. Responsiveness uses the fact that relationships between people are not necessarily

equal; some individuals or groups within the relationship may be required to give or receive more care than others (Holstein & Mitzen, 2001). Being cautious of such relationships of subordination is critical for avoiding the abuse of those receiving care; in this case, the users who trusted Samsung to create a safe smartphone for commercial use. Inadvertently or otherwise, Samsung exploited their customers when they decided to accelerate their production schedule and thin out the battery cathode separator. Since Samsung was in a position of power, they should have recognized the inequality in its relationship with consumers and acted in a way that provided more adequate care.

Responsibility according to Tronto's definition of the four tenets of care is a willingness to respond and take care of need. While attentiveness focuses on the acknowledgment of a need for care and competence on the effectiveness of such care, responsibility establishes which members of the relationship are accountable for providing it. These members can be a single individual, a social group, or even a large scale corporation. In order to hold Samsung responsible for the incidents relating to the Note 7, it must first be shown that Samsung has a responsibility to report and communicate clearly that the Note 7 could present a possible safety breach. Under regulations within the Consumer Product Safety Commission (CPSC), it is the responsibility of manufacturers to immediately report their defective product if it creates a substantial risk of injury or death to consumers ("Duty to Report", 2016). This statement from the CPSC states that Samsung has a legal obligation to report any and all safety faults related to its devices immediately. While Samsung did eventually report the safety issue to the CPSC on September 9th, they did so over two weeks after hearing reports of the first explosion incidents. Up until coordinating with the CPSC, all Samsung had done was announce an informal recall and cease production of new Note 7s. The alarming delay between Samsung's informal

recall and their coordination with the CPSC is grossly irresponsible and served only to confuse users on what exactly they should do with their smartphones (Wells et al, 2016). Through their delayed coordination with the CPSC, Samsung failed to clearly and explicitly report the safety concerns and proper recall procedures to their consumers, which demonstrates a lack of responsibility on their part in this case.

Now that responsibility has been established, the issue becomes deciding whose responsibility it is, Samsung as a whole, a specific team, or a single individual? Collective responsibility can be used to answer the question as it states the responsibility of the corporation is more than the sum of its individual responsibilities. This can be analyzed by first examining the engineers responsible for the design and testing of the Note 7s. While they are responsible for measuring the quality of the devices, it is ultimately up to management and higher up executives to decide if production should be halted or delayed. These managers were responsible for putting pressure on the manufacturing units in order to meet strict production requirements, but were likely not responsible for coordinating with the CPSC. This illustrates the difficulty in assigning responsibility to a single individual or team since any of the groups could have realistically taken action to change the outcome of the Note 7 crisis. Thus, the concept of collective responsibility can be applied to illustrate that Samsung as a corporation can be held responsible while the individuals within cannot.

Conclusion

Through the lens of care ethics, it can be concluded that Samsung is morally responsible for the incidents caused by the Galaxy Note 7 explosions. Using Joan Tronto's four sub-elements of care as a basis to the analysis demonstrates Samsung's fundamental lack of attentiveness, competence, responsibility, and responsiveness. Samsung's actions in the production and recall

of the Note 7 illustrate their abandonment of moral obligation to towards their consumers. Although Samsung faced heavy revenue declines and lawsuits over the incident, determining who specifically was accountable and why has been a challenge.

Modern engineers are certainly responsible for the safety and well-being of their users and everyone else in society. Often times it can be difficult to gauge what decisions and actions are right or wrong, and whether or not they will lead to the harm of others. While this risk can never be completely avoided, we can use rigid, well-defined frameworks like care ethics to get a better understanding of the ethicality and potential consequences of given actions.

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