

Case Study: The Ethical Dilemma of Engineering Weapons

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Introduction

Engineering is a competitive and constantly growing field. Today, a significant number of engineers work on military-related projects, usually for a company with a defense contract with the United States government. Often, these companies pay their engineers high salaries because of the excessive government military spending. However, the products designed by these companies can be extremely deadly. Ethical issues arise when thinking about how these products affect innocence, especially considering that most casualties from war are civilians [1].

The purpose of this case study is to explore the ethical dilemma associated with accepting jobs from companies with defense contracts, particularly the design of bombs and other weapons. This study will define the stakeholders of the dilemma and the methods of choosing the most ethical recommendation. An analysis will be performed using deontology and consequentialism theories while relating the case to the 'just war' theory and the Manhattan Project.

Background

An engineer is seeking a job within their engineering field. They are presented with a fantastic job opportunity, but it is from a defense contracting company. Three different decisions this engineer could make are discussed: accept a position creating weapons for this company, accept the position only if the job is working with non-lethal devices, or refuse all positions from this military-affiliate company. Given the extensive list of engineering positions from United States

defense contractors, these are decisions that many engineers, including myself, have faced. At what point does one become unethical when supporting a defense contracting company?

There are many stakeholders that an engineer must think about before working for a weapons manufacturer. First is the engineer. The decision impacts their financial and career needs and impacts their ethical views. People rely on money to support themselves and their families, and denying a job opportunity one desperately needs may be detrimental. The engineer's ethics will also be affected, as people's views on global conflicts differ, and the government may or may not support the same views.

Another stakeholder is the United States government. The government is the primary customer for defense contractors, as military spending is a significant part of their budget. Wars and global conflicts are not new, and the United States has been involved in bombing and supplying weapons for many years. The government relies on weapons and military technologies to maintain national security, hold global power, and defend against international threats.

The American public is another stakeholder in the manufacturing of weapons. Citizens rely on the government to protect them from danger and uphold national security. For many people, the development and use of weapons is seen as necessary to maintain peace and stability.

Another major stakeholder is non-American civilians. This includes anyone in countries affected by conflicts where weapons manufactured by defense contractors are used. These people are often caught in the crossfire of wars and conflicts, and they suffer from the consequences of

these weapons. This would also include the environment, as many destructive weapons can be damaging to a country's environment.

The final stakeholder is the company the engineer is working for. Companies require engineers to design and produce new technologies and products that can benefit others and, more commonly, gain them profit. Joining this company as an engineer supports what the company does and allows them to continue their business as they already are. As many defense contracting companies do, this company could be making a wide variety of products that benefit different people.

Method

The framework used to analyze this case will involve applying agent-centered deontology and consequentialism ethical theories. This framework was chosen to get two perspectives on each option. Agent-centered deontology prioritizes the actions that agree with the responsibilities of an engineer. Consequentialism prioritizes the maximum goodness of the outcomes of each option.

Within deontology, the role of an engineer and the actions they should and should not take to uphold their professional duties will be examined. This will include looking at the responsibilities that engineers have to the public. Furthermore, the role of the government on its citizens and the outside world will determine if an engineer should be developing weapons.

Consequentialism will be used to justify the overall “goodness” of each situation. This theory involves picking the action that provides the most good to the largest amount of people. To determine “goodness,” the four principles framework introduced by Beauchamp will be utilized [2]. This framework lists four principles that can be used to define good. The first of these principles is beneficence, which includes actions that produce the most benefits to people. This could mean improving people’s happiness or health. Another principle is nonmaleficence. This category incorporates actions that prevent harm, like killing, injury, and the deprivation of others’ well-being. The next principle, respect for autonomy, is the belief that actions should recognize people’s freedoms as individuals. This includes actions that do not strip away the rights of others and protect their ability to choose. The final principle is justice. Justice encompasses fairness and equality between people, preventing one group from being treated worse than another.

These four principles will be used when analyzing each situation and the outcomes that affect the stakeholders. Since these principles represent “goodness,” a consequentialist will choose the situation that prioritizes these principles. This will determine if the benefits of each situation outweigh the harm.

Analysis

Before discussing which situation is most ethical for the engineer regarding taking a job with a defense contractor, the moral responsibility of an engineer must be mentioned. Should an engineer's personal life influence their choices, and to what extent is an engineer accountable for their work's outcomes?

The responsibilities of an engineer are essential for understanding what is expected of them.

These responsibilities are not well-defined and known, but Smith, Gardoni, and Murphy attempt to create a clear list of engineering responsibilities separate from broad codes of ethics [3]. One of these involves the commitment to work based on the advancements of goods. The engineer should work for “the achievement of objectives such as safety, sustainability, and technical excellence” rather than financial gain and status [3]. Furthermore, engineers who prioritize personal gain often act more unethically.

But is it ethical to take the job as an engineer? Destructive weapons are only possible with an engineer to design and produce them. Yet, Bowen notices that the role of an engineer in war is rarely accounted for and describes engineers' essential role in a war, using the ‘just war’ theory [1]. This theory lists requirements that must be met before war is commenced and not be broken while a war occurs, in order to have a ‘moral’ war. Specifically, it requires a just war to be started as a legitimate last resort when no other peaceful ways can be reached, and when started, innocent civilians are protected. However, recent wars have done very little to protect civilians, leaving many dead, injured, or displaced [1]. When looking at recent wars, Bowen suggests engineers would conclude that “if any of these wars were just, then just war theory has not protected civilians; if all of these wars were unjust, then just war theory has not protected civilians.” Bowen continues by explaining that an engineer’s role should be to focus on preventing wars. If just wars are only started when no other peaceful solutions are possible, why are engineers working on weapons rather than these solutions? Virtually all agree with the engineer’s responsibilities found earlier; engineers are responsible for working to solve current and future problems [3], not creating weapons for war [1].

This case relates to J. R. Oppenheimer's decision to join the Manhattan Project. Although it is not a modern example, Oppenheimer's decision to create an atomic bomb is well known and documented. It shows the responsibilities and consequences that come with engineering destructive weapons. The creation of the Manhattan Project started in 1941 after the United States was told of the possibility of an atomic bomb and feared Nazi Germany would beat them in making it [4]. Oppenheimer was brought onto the project and successfully led the development and testing of the first atomic bomb. With the power to create atomic weapons, the United States dropped two nuclear bombs on Japan, killing over 100,000 people. Some may argue that dropping the bombs ended World War II, and if the United States didn't develop them, the Nazis would have. But Oppenheimer ultimately regretted the decision to create the bomb and even stated, "I have blood on my hands." This example shows the outcomes of destructive weapons and can be used to analyze a consequentialist's point of view.

With the responsibilities of engineers defined and a real example of consequences, the ethical decisions of the case can be analyzed. The first option for the engineer is to accept the company's offer and engineering weapons. Looking at the stakeholders, this will benefit the engineer and the company because they both can profit from the weapon designs. However, deontology states that the ethical decision must be objective and fit the agent's obligations [5]. As discovered above, American citizens and foreign civilians expect a specific role of the engineer and their responsibility to create solutions to problems and protect people. This option contradicts the duty of an engineer because of the harm it can do to foreign civilian stakeholders, so a deontologist would not choose this option. Relating to the Oppenheimer example, the creation of weapons can

defend the United States and end wars. However, if these wars fail the 'just war' requirements, then the deaths and destruction caused by these weapons are unjustified, and the engineer is acting unethically. A consequentialist could still agree with this option if the good outweighs the bad. The 'goodness' of this option can be found by relating it to the four principles. Beneficence is shown to the engineer and the company because of the financial gain, but as mentioned before, personal gain often leads to more unethical outcomes. The government is also shown beneficence because it is gaining the weapons used for international power and defense. Nonmaleficence can be seen within the context of Americans. If these weapons help the government defend the country, then harm is prevented to Americans. Justice fails in this option because it prioritizes Americans over other civilians. In the example of the atomic bomb, 100,000 civilians died from the creation of the bomb, yet Americans were fine. Even more so, most deaths in modern war have been on foreign civilians, not Americans. A lack of 'good' is placed on foreign civilians, meaning a consequentialist may not choose this option.

The second option is to accept the job, only if the engineer will be working on non-lethal devices. This benefits the engineer because they do not design weapons but can still support themselves financially. Applying deontology to this option shows that supporting the engineer's financial needs is irrelevant. As stated above, deciding on work based only on money and status is unethical, often resulting in more unethical behavior. This option can still argue deontology is being used because the responsibilities of an engineer are still being met by creating non-lethal solutions to problems and hopefully preventing wars in the first place. However, support of the government, even if non-lethal, still negatively affects civilians, and these tactics are often used in unethical ways [1]. This support would still make this engineer a part of the war, and the same

‘just war’ responsibilities are placed on them. We can examine the ‘goodness’ of this option for consequentialism. Beneficence is applied to the company and the engineer because both can make a profit. Nonmaleficence is shown in the American public by supporting the defense of the United States and foreign civilians because of the refusal to work with lethal weapons. Respect for autonomy is given to the engineer for the choice of their ethical views and to a civilian’s right to life. This option provides more substantial reasoning than the last within deontology and consequentialism.

The final option is to refuse the job entirely. This means the engineer would not work with bombs or for a company that produces weapons. Deontology could accept this option since the engineer's responsibility is to find solutions to prevent wars, but it is not defined what the engineer would do after refusal. Beneficence is lacking for this option since refusing the job provides nothing for any of the stakeholders. Again, nonmaleficence shown in foreign civilians because of the refusal to create weapons that primarily harm them. Nonmaleficence is also shown in the environment. Using the Oppenheimer example, destructive weapons can cause immense environmental damage and contamination that lasts for decades [6]. Respect for autonomy is given to Americans for the choice of whether they choose to make bombs or not. It is also given to other civilians for the right of life by the engineer. Justice is shown to Americans and civilians by showing fairness in the lives of innocents. This option can be related to Oppenheimer’s story because of the regret and depression he faced after seeing what the bombs could do. This can be added to nonmaleficence, since it protects the engineer from the guilt they might face. Given that this option provides the most good to the most amount of people (foreign civilians), this option would be chosen by consequentialists.

Recommendation

Using the framework of deontological and consequentialist ethical theories, the clear choice is that the engineer should refuse all positions from this company. This recommendation was chosen for many reasons. Firstly, it was the only option that a deontologist would agree with. Although it is ambiguous based on what the engineer would do after refusing this position, the other two possibilities broke the responsibilities of an engineer, failing both international civilians and American stakeholders. An engineer must be committed to solutions that help solve issues in the world and prevent wars, not create weapons that can end them. Looking at the 'just war' theory shows that many wars, modern and past, are not moral in the way they are held, and innocent civilians and the environment are usually the only ones that pay for it. Furthermore, a consequentialist would pick this option because it maximizes good based on the four discussed principles. While it does not provide the most beneficence, it protects Americans, civilians, and the environment through nonmaleficence and is the only option with justice for all stakeholders.

While accepting a job in defense manufacturing, even in non-lethal roles, can provide personal and financial benefits, it ultimately supports a system that prioritizes the interests of a few at the expense of innocent civilians. The responsibilities of an engineer extend beyond technical expertise and have a duty to contribute to peace and prevent harm [1] [3]. Therefore, the most ethical choice is to refuse involvement in creating destructive weapons and instead focus on solutions promoting global peace.

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