

How might my work on the lunch order delivery system contribute to unintentional harm?

Technology is one of the biggest gifts in the modern world, but every invention has its by-products, one of which is unintentional harm. Harm is understood as “damage done to something”¹ and with technologies damage most often arises from ethical violations, not from technical faults as these are easier to prevent. To discuss this topic and illustrate that even a relatively simple digital system carries much unexpected ethical harm, I’ll analyze fairness and non-harm problems in the lunch ordering system² which I’m developing for a University of Edinburgh client. This system enables University’s students to order lunch from nearby restaurants, and have them delivered during the break by an autonomous airborne drone. My role in this project is to create the program which will fetch information about placed orders and participating restaurants and based on various restrictions calculate the most efficient path for the drone. This essay proves that my work on this project can make the product biased against some students and affect the welfare of the neighbourhood and discusses who is accountable for solving these problems.

The lunch delivery system is potentially biased against students placing cheaper orders which violates the fairness principle in one of the most important codes for IT professionals, namely in ACM “Code of Ethics and Professional Conduct”³. Since there’s only one drone with limited battery, it’s accepted that it won’t deliver every order and will prioritize orders based on the percentage monetary value which “<...> is calculated as the total monetary value of deliveries made divided by the total monetary value of orders placed”². Maximizing this metric means delivering more expensive orders first which include orders of more expensive products or occasions when a group of students combine their lunch orders into one order. As a consequence, two groups of people are disadvantaged - people who cannot afford expensive lunches and people who don’t have close relationships with peers. Both of these problems are relevant - study about Scotland’s students’ financial hardship indicates that over two fifths of respondents are concerned “about their ability to manage financially during the pandemic”⁴, whereas one in six students think they have no close friends at university according to the article published by “Independent”⁵. Nevertheless, one may argue that solving these problems may introduce some new issues. For example, the utilitarian ethics claims that developers must aim to “produce the greatest total amount of utility”⁶, whereas, not allowing to combine several orders into one results in serving less people and reducing the overall utility. However, the utilitarian approach is often criticized for human rights violations⁷ and when looking at ACM’s principles³ none of them aim to maximize collective welfare. To conclude, it’s crucial to question the percentage monetary value metric since it creates an exclusion between wealthy and poor, social and more introverted students.

Drone often crossing residential areas, can increase noise pollution here. In the lunch delivery system the drone can travel only within the restricted area, however this area also covers residential parts². Operating drones raise noise levels up to 75-80 dB on average⁸ and these numbers exceed a tolerable upper bound of 70 dB⁹. As noted by the European Environment Agency, “long-term exposure to noise can cause a variety of health effects <...>”¹⁰ which proves that our service violates ACM principle “Avoid harm” where harm includes “unjustified physical or mental injury”³. One may argue though that the drone will operate only for one hour during lunch² when most people aren’t present at home. However, one must acknowledge infants and elderly who don’t leave home depending on working hours and who are more sensitive to noise. Transient sounds for babies cannot exceed 65

dB according to A.Gupta's study¹¹, whereas elderly become more sensitive to noise due to their medical conditions such as dementia¹². Even though this is a minority of people, we should consider them as equally important, not as "edge cases" as stated by technology philosopher S.Vallor¹³. In conclusion, not well-thought paths of the drone can have negative implications to the health of neighbourhood residents.

The question of who should address and solve these problems is controversial. There are several accountable actors. The first one is me, the developer. It might seem that I can directly influence the way the program works - I can make the drone choose one order or one path over the other to make the system more fair or less disturbing to residents, however I have to follow certain regulations, imposed by the University's client. If my percentage monetary value is low, my model is evaluated as poor. If I'm preventing the drone from entering residential areas, I'm wasting the drone's battery and thus serving less orders. This actually harms me as a developer and as noted in the "Responsibility" lecture this makes me less responsible: "If following the law means you will be harmed, <...> you are less obliged to follow it in that instance."¹⁴ Since I'm dependent on the system's specifications and only the University's client has the power to change them, they also become responsible as power implies responsibility. Nevertheless, changing specifications also comes with a cost for the client. Like every business, they're interested in profit, whereas, trying to solve aforementioned problems is likely to reduce the profit or cause some delay in product launching. However, if these potential issues really occurred, public outrage might happen affecting the client's reputation which is as valuable as profit, therefore, it is actually in the client's interest to address these problems. Hence the University's client has greater responsibility to tackle these problems as they have power to do it and are influenced by the project's success.

To sum up, even working on some small part of the project can cause considerable unintentional harm. The lunch order delivery system might negatively influence both the actual users of the system, and people living in the area where the service will run. Solving these problems is complicated for every accountable stakeholder since it requires some sacrifice.

References:

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