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Ethics of Amount of Testing

A fundamental problem of software availability and reliability depends on the cost and time of developing those programs. To avoid high costs, some programmers will sacrifice the amount of testing done which will make the program more widely available. The downside of doing this is that the programs' reliability goes down because of the unknown risks. In the Therac-25 case, the program was tested at the system level only and not module and software level which caused software error codes to arise which resulted in deaths and injuries of patients.

So, how do we determine how much testing is necessary? When it comes to finance, aircraft, and medical, there should be an extensive amount of testing done in order to follow the ACM Code of Ethics 1.2 Avoid Harm. The harm that can be caused are injury, death, or other negative consequences. There is no justifiable reason to sell a life-threatening system to make it accessible to more people. Deuteronomy 22:8 "When you build a new house, you shall make a parapet for your roof, that you may not bring the guilt of blood upon your house, if anyone should fall from it." When making a program, the programmer has a role and legal responsibility and will be held accountable for any deficiencies and the programmer or organization can be charged for a crime. This allows for the victim or the victim's family to get compensation for the harm caused (Loui and Miller).

A way to help minimize costs but still have a reliable code is to not reuse or use interrelated code since it is more susceptible to errors when doing so. Another way is to have

more documentation before the start of coding in order for future developers to maintain the code and know what is happening the code rather than reading a programming language and not knowing what is happening. It also saves time and money since it is easier to see where updates are needed to enhance the code (Atlassian). You could also try to keep the designs of the program simple instead of complex to decrease the chance of bugs and errors. This also reduces the maintenance cost in the long run since problems can be quickly identified and fixed. This will also save on the time spent on testing but will still have the extensive testing required to make sure the program is reliable and follows the standards of engineering.

Since software engineering requires training and experience anyway, it can be made official by getting a certificate in software engineering to ensure that the person programming will follow the correct procedures and know what they're doing. I think it should be required to assure the users and the company that the program was made professionally. This will also help follow the IEEE Code of Ethics "to uphold the highest standards of integrity, responsible behavior, and ethical conduct in professional activities." 1 Corinthians 10: 23–24 [23] "I have the right to do anything," you say—but not everything is beneficial. "I have the right to do anything"—but not everything is constructive. [24] No one should seek their own good, but the good of others."

The wrong way Therac-25 impacted society and moral obligations of a computer professional is the deaths and injuries it causes to the patients along with the emotional trauma it could've caused to the users using the machine since they were blamed even though it was a flaw in engineering. This also led to the mistrust of computer professionals since it makes the professionals seem like they aren't doing their job right. The right way it impacted though was that because of this incident, it showed the importance of testing software and the need to do

things up to standard. This provides an example to future developers, the consequences of the way this project was conducted and that they should learn not to make the same mistakes (Ethics Unwrapped).

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