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*THERAC-25: unethical software programming*

THERAC-25 was a software disaster that caused tons of doses of radiation to be passed on to many patients. Software errors will always occur in any system however the proper testing usually tends to fix these issues. In THERAC-25 the proper testing did not occur causing patients harm by radiation poisoning. To determine how much testing is needed one must answer the question of how safe it is to execute. Does this system require a 100% success rate if so, is human life at risk if this system fails? These questions tend to lead to should there be testing in every program, how much testing is needed, and should there be a certification process. When it comes to Health technology or anything with human safety there must be a certification process just like engineers have so that plenty and proper testing is administrated.

Software testing can come at a price, a very expensive one. The amount of money it cost to test systems also generates how much it will cost the individual. This also would produce the problem of individuals not being able to afford it, which in turn makes it less accessible.

Software companies have tried to cut testing out because of this issue however the stakeholder's health and safety are put at a huge risk. IEEE's code of ethics states, "to hold paramount the safety, health, and welfare of the public, to strive to comply with ethical design and sustainable development practices, to protect the privacy of others, and to disclose promptly factors that might endanger the public or the environment." In other words, programmers should account first and foremost for the safety and wellbeing of the public/individual over anything else. The

way THERAC-25 was handled was unethical and the ethical practices that IEEE states should be practiced in the workplace to provide the healthiest outcomes. This leads to prove that there is no reason why a less reliable life-threatening program be available to the public. In my opinion, I would not use the machine used in THERAC-25. The negatives over-weigh the positives in this experiment and my health is of extreme importance to me. The solution to this issue is to regulate testing when it comes to health technology. The government should be creating a regulation process of testing a system and providing grants to make testing cost-efficient and reliable when it comes to health. No individual should ever have to risk or lose their life just because software testing is a costly measure.

Just as there is a certification process for engineers to ensure that what they build is reliable there should also be a certification process for software programmers in ensuring their programs run reliably. This is essential as no human life would be put at much risk and they would feel safe knowing that the process has been certified. The ACM general ethical principles declare, “1.2 Avoid harm ... Well-intended actions, including those that accomplish assigned duties, may lead to harm. When that harm is unintended, those responsible are obliged to undo or mitigate the harm as much as possible. Avoiding harm begins with careful consideration of potential impacts on all those affected by decisions ... ensure that all harm is minimized.” In the end, the harm should be minimized and by providing a certification process we eliminate the problem before it becomes a problem. In my opinion, this is what I would want to be done because I would not want to be harmed in a treatment like THERAC-25. The Bible states, “Luke 6:31: Do to others as you would have them do to you.” If I would not be a part of the THERAC-25 treatment I would not encourage others to do it either. A certification process would be the

best manner of fixing the testing problem. This would give me the will to then be a part of the treatment and allow others as well.

The Bible, AEE, and IEEE's code of ethics is the places a computer programmer and software companies must look to when in need of the ethical rules to live by. As the largest takeaway from this essay, software companies must understand that harm should be avoided by properly testing their software even if it comes at a cost. A certification process would help immensely on Health technology however as of now companies should strive for the healthiest and most successful testing while there is not a certification process. THERAC-25 was a disaster that could have been avoided by proper following of the ethical practices mentioned in this essay. Now with the proper understanding of what following unethical practices could cause I hope you can see how important it is for a computer programmer to follow their code of ethics and morally understand the bible as well.

#### Works Cited

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