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The THERAC-25 Accidents and the Questions They Raise

The THERAC-25 accidents are an unfortunate example of what can happen when an inadequate amount of testing is done to crucial software. These accidents occurred when the THERAC-25 machine mistakenly gave lethal doses of radiation to patients. This is a heavily criticized case due to how preventable it was. When it comes to the safety and wellbeing of human lives, there can never be enough measures taken.

When creating software with as much importance as that with the THERAC-25, a multitude of testing must be done until everyone involved in the project is absolutely certain it works without fault. The only exception to this is if a patient who the machine is being operated on is aware of the risk and accepts that the software may be faulty. Someone may do this if they do not have very much money but still need the machine. Like myself, most people would be willing to take the risk of death and use the machine if it means a chance at survival. The people in charge of this project were a bit careless with it, as it was very preventable. Firstly, only one person developed it (Leveson & Turner, 20). Furthermore, multiple other questionable measures were taken such as reusing software and only performing a “small amount” of testing on the software alone (Leveson & Turner, 20). The people in charge of developing this software should have developed it with the mindset of having it used on themselves. There is scripture to back this up, too. Luke 6:31 says, “Do to others as you would have them do to you.” (NIV) If the people who were getting this treatment done to them had the option, they would certainly want

the equipment vigorously tested to ensure that their chance of injury was as low as possible. It is very important to recognize just how big of a deal it is to be designing the code that will affect lives forever. Another piece of scripture that backs this up is found in 1 Corinthians 8:9. This verse reads, " Be careful, however, that the exercise of your rights does not become a stumbling block to the weak." (NIV) It is important that the software engineers in charge of creating programs in the medical field do not become complacent in their knowledge. God has blessed these professionals with the ability to create some incredible programs, so they must recognize this and keep yearning to learn more and create the best possible programs they possibly can. After all, a human life is in the hands of them.

Software engineers working in the medical field should absolutely be required to obtain some sort of certification that ensures they can build a reliable product. The ACM Code of Ethics has a few principles that are very applicable to this issue. Principles 1.2 and 1.3 say that a computing professional should avoid harm and be trustworthy, respectively (ACM Code of Ethics and Professional Conduct). Principle 1.2 in particular really applies to this mishap, as many people were terribly harmed because of this software error. There is absolutely no excuse for a software engineer working in the medical field not to be required to have more safety certifications than their counterpart working in another field. Another possibility is for every software engineer to be required to obtain certifications regardless of their field. This, however, is not a good idea; only those in fields that could have severe consequences on the safety of humans need to obtain certifications that ensure they can build a reliable product. It would be a complete waste of time and resources for a software engineer working in a field of lesser volatility such as the video game industry to obtain a certification such as this.

Bibliography

acm.org. 2016. *ACM Code of Ethics and Professional Conduct*. https://ethics.acm.org/code-of-ethics/. Accessed 17 September 2022.

Leveson, N.G., & Turner, C.S. “An Investigation of the THERAC-25 Accidents”. IEEE Xplore. 1993. pp. 18-41.