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Dr. West

Ethics Paper – THERAC-25

Considering the fundamental problem of software availability and reliability, most applications that are written by software engineers are viable with a low success rate, with health technology being one of only a few huge exceptions. One case involving this topic is found in 2003 titled “THERAC-25” where a radiation therapy machine by the same name gave lethal doses of radiation to patients due to software errors (Leveson). Investigations on the machine determines that the software at fault was developed by a single programmer who had focused on integrating the software with the hardware and spent little time on testing only the software piece. While you can argue that it is solely the programmer’s fault or the people who funded the project or any other combination of blame, there are couple of questions that this presents and need to be answered (Leveson).

Firstly, how do we determine how much testing is necessary for a product to go any further than the proving grounds? In the case of the THERAC-25, there needs to be a viable reason to sell a less reliable life-threatening system to potentially help more citizens, which in this case, would be that the machine can flawlessly execute anything handed to it. We need to make sure that enough testing is done on this machine to make sure that everything goes well. With the argument of cost being introduced, you could implement the same software on a machine that produces a stream of water rather than a stream of radiation. You’d be able to compare the measurement of radiation given to the measurement of water given through simple ratios. Now, obviously you cannot test any possible combination of things that a user might enter into the program, but this method would let us more flippantly try things that we couldn’t do originally because of the cost. Personally, I feel that if I was the creator of this machine and tested it that thoroughly, and then for some reason needed this exact treatment, I would use the machine. It’s my creation and I would own up to whatever the outcome may be, good or bad. After all, according to Proverbs 14:23 [“Work brings profit, but mere talk leads to poverty.”] (*Holy Bible*), we are called to be of sound integrity and do what we say would do, not just talk without any motives.

Secondly, this whole situation calls for a review of the certification process software engineers. One exists for “*regular”* engineers and explicitly talks about “dedicated to advancing technology for the benefit of humanity” (Mission & Vision). This should reign true, not only including regular engineers, or including software engineers, but anyone who works with any sort of technology. There should not be any type of technology that is only being created for the destruction of mankind. Any sort of certification process would definitely keep a worker in check with their motives, even if they ethically don’t have any themselves; this would be an excellent fail safe. However, there should not need to be a special ethics contract that one should have to sign in order to be held accountable for their actions. As a human race, we should be able to come together and know that we should only do what is beneficial for others. The Bible also says that we should “not let any unwholesome talk come out of your mouths, but only what is helpful for building others up according to their needs, that it may benefit those who listen” [Ephesians 4:29] (*Holy Bible*). This should also translate to our physical actions and be held above all other rules of society. We should help instead of hurting and benefit others instead of just ourselves.

Work Cited

Holy Bible: New Living Translation. Tyndale House Publishers, 2013.

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“Mission & Vision.” IEEE - Advancing Technology for Humanity, www.ieee.org/about/vision-mission.html.