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The Ethics of Software Testing

Software testing is an integral part of the process of developing and implementing software programs regardless of whatever field the program is designed to be used in. Software testing ensures that the product works as intended and meets all goals that it should without fail, and saves money later down the road should the program require fixing. It improves both the reliability and the security of the code in all manners, including financial. In some industries, however, software testing is much more important, as fields like aircraft, health, and financial technology requires the minimum margin of error. I believe that the amount of testing necessary should be dependent on the field that the program is going to be utilized in, as a program for ensuring that aircraft can fly safely is largely more important than a program made for entertainment. Software testing can be expensive to go through, however, and for fields that people depend on having access to, those programs should still be both affordable and safe. In the case of the Therac-25 machine, I believe that there should not have been only one programmer in charge of writing the code at all; they had no one to double check their code but themselves, which in my experience is a very dangerous practice, and in this case, deadly. For projects such as writing code for life-saving machines, I believe that safety should come before anything else. To quote the ACM Code of Ethics and Professional Conduct's principle 3.1, "People – including users, customers, colleagues, and others affected directly or indirectly – should always be the central concern in computing." The amount of testing necessary should be proportional to the program's intention because safety is paramount.

I believe that a certification process for software engineers should exist, at least for those

that will be going into a field where an error in the program can result in injury, be it either financial or physical. At the very least, software engineers should be examined by their own higherups before taking on a contract that involves a level of expertise in a certain field or when a particular level of safety is required. I feel this should be because in many cases, an engineer will design something that will then be operated by a program written by a software engineer. In either case, if the device itself is faulty, then it is the engineer's problem, but if the device is perfectly fine while the program it runs on is faulty, then it is the software engineer's issue. Why should those who make the device undergo certification if the people that write the code for said device to work do not have to?

In my opinion, the field of software engineering has made a net positive for society. Software engineers have written code that allows us to travel over the skies, save countless lives, and to bring security, entertainment, and education across the world. This responsibility lies upon the shoulders of the individual software engineer, however, and each should be mindful of their own work and the work of others where applicable. The first principle of the Institute of Electrical and Electronics Engineers states that members are: "To uphold the highest standards of integrity, responsible behavior, and ethical conduct in professional activities." To quote the Bible, 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." Think of writing a program as building a new house, and always ensure that safety is paramount in its development.