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The Ethics of Software Testing: Does the Short-Term Cost Outweigh the Long-Term Benefits?

In the mid-to-late 1980s, there was a series of accidents in the medical field which would challenge the field of computer software ethics for years to come. Its name: Therac-25.

According to the report “An Investigation of the Therac-25 Accidents”, these accidents were caused by a software bug in the programming of Therac-25 radiation therapy machines which caused excessive and lethal doses of radiation to be administered to patients, resulting in many deaths of patients and lawsuits against the Therac-25 creator company. With regard to the benefits of software testing versus the financial cost of such testing, specifically in the medical field, I believe that more testing should be done before release because putting in the work to test the software upfront will have less financial and credibility cost in the long run. If a company did not put in the time and money to test their medical software as much as they should have to fix all errors, and they ship this software in a buggier state, then they may make more profit in the short term. However, if issues resulting from the buggy software come to light which resulted in harm done to a potentially great number of patients, then the company will be most likely held liable for these issues both by the public and in lawsuits, costing the business their credibility as well as much more money than they would have paid to have the software tested more fully. According to “Litigation Cost Survey of Major Companies”, the average outside litigation cost per survey respondent (company) in 2008 was \$115 million. Even in 2000, this average cost

figure was still \$66 million (both figures are likely not adjusted for inflation). (2) Based on this, I cannot imagine that the increased financial cost to thoroughly test embedded medical device software, such as that made for the Therac-25 machines, would have been greater than or equal to the cost(s) of dealing with one or more lawsuits. Additionally, if a company properly tests their software, then any accidents likely would not happen at all and would not cost the company any credibility. Thus, I argue that, from a business perspective in the medical field, it is always worth it to test software thoroughly because thorough testing will cost less in the long run than will the consequences of not thoroughly testing the software.

Secondly: should a state certification be required for software engineers? To answer, I believe that software engineers should have a state certification available and that it should definitely be required for software engineers working at companies in high-stakes fields such as health and finance. Because these fields have such low tolerance for errors due to the catastrophic nature of errors in such fields, companies need to be sure that their software engineers adhere to a standardized code of ethics and can be trusted to design high-quality products. According to Deuteronomy 22:8 in the ESV Bible, “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.” A parapet is a short wall along the perimeter of a roof which keeps people from easily falling off the edge of the roof. Thus, the point of this verse is that anything, whether physical or digital, should be made in a way that protects the safety of its users. This coincides with the IEEE Code of Ethics, which primarily states that software engineers must hold paramount the safety, health, and welfare of the public. Thus, there could be a certification for software engineers requiring that they know, understand, and adhere to the IEEE Code of Ethics in addition to having all the necessary knowledge and skills.

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