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<center>Certification and Medical Equipment</center>

When it comes to programming in significant fields like medical practice or government protection, the software has to be able to provide what the user needs accurately and with low risk. For the Therac-25 system, it was clear that the program's interaction with the hardware was flawed and led to many deaths, leading to the conversation about if software engineers should have a certification process to prevent these mistakes. Programmers should be able to test their programs thoroughly for their projects with a certification being required for major projects brought in from the government.

The Therac-25 was a critical component for treatment in hospitals as it used radiation applied to a subject's body in order to treat them. With these details, the development of the software for the machinery would fall under Section 1.2 in the ACM Code of Ethics which states that if a program can do harm unintentionally, those working on it are "obliged to undo or mitigate the harm as much as possible" and "report any signs of system risk that might result in harm" in order to prevent it ("ACM Code"). This is why programs are to be tested thoroughly in order to prevent such issues. This was not the case for Therac-25, as it was stated that only a "'small amount' of software testing was done on a simulator" to make sure it ran properly (Leveson, 20). The programmer in question could have been testing this software on his own or multiple times when he

could with the company to make it work well and not bring up costs too much. Regardless, certainty that the software and hardware will work together is important for helping many people with minimal potential of hurting them as well. If I were given the option to use a product I know does not have a high certainty of working properly, I would not use it at all.

Certification of engineers is crucial for major projects brought out by government-influenced companies in order for the certainty that the project ends safely without complications. For most programmers who do not have work with the government or projects that can influence the lives of many directly, they should not be forced into getting a certification for all their jobs. These certifications for critical work should show that the programmer will "avoid unlawful conduct in professional activities" and "avoid real or perceived conflicts of interest" as they work ("IEEE Code"). By doing so, it will ensure to the major company that this programmer is able to work on their systems with some sort of qualification to justify ethical practice. It will also make companies believe that they will have a more reliable program when it is finished.

With programming and programmers, following the ethical code is typically best for the good of all parties involved in what is being made, whether they are affected directly or indirectly. Programmers should be given time to test their program and confirm that it works as intended before allowing the product to be sent for use. They should also be required to have a certification only if they work on important projects for the community, such as medical equipment.

References

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