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Homework Assignment 1

CSCI 463 – Software Engineering

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Homework 1

**Q A: Explain why this estimate should be adjusted to take project, personnel, product, etc. into account.**

**A:** In order to get an appropriate estimate for the system, the group planning the project need to take a variety of factors into account. Allocating a proper amount of time and resources to create a system that is safety critical is crucial. This is the case for a software system that will be designed to control a radiotherapy machine. If this project would not be adjusted to take additional factors into account, there would be a chance that the final product would be comparable to the Therac-25 software failure. Additionally, the planning allows team members working on the project to communicate the design both internally and externally with the costumers in order to ensure an efficient development of the final product.

**Q B & C: Can you suggest four FACTORS that might have significant effects on the initial COCOMO estimate and possible values for these factors.**

**B:**  The first of the four factors at the top of the list of importance for this project would be Reliability (RELY). When flying in an aircraft, a passenger wants nothing more than the reassurance that the plain will fly and land reliably. The same goes for any safety critical system. A patient going in for treatment should be able to receive the proper amount of radiation without having any additional worries added to them.

My second factor would be Complexity (CPLX). This factor is one that ties in well with reliability since a complex system is commonly more prone to failures. This is important since either user or system errors could result in serious injury or death in a system that relies heavily on safety.

Next on the list will be programmer capability. Programmer capability, in my opinion, is determined not only by the amount of expertise they have with programming in a certain language, but also the experience they have working in a certain field or type of system. In a safety critical system, experience will give developers the insights they need to properly create a system that can be both minimally complex as well as reliable.

The final factor on this short list will be Modern programming practice. In my opinion and limited knowledge, developing a safety critical system should be built using an approach that does not rely development steps being done all at once such in the waterfall method. When developing a safety critical system, multiple phases of design, development, and testing will benefit the final customer by ensuring that the proper design is being completed and verified through testing along the way. This software engineering method is known as Agile development and is one that has multiple variants that can fit the project being worked on.