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CSCI 463

Assignment 1

1. The initial estimate of a 26 person-month project timeline is based on a standard baseline where all drivers are set to 1. This estimate may not accurately reflect the amount of effort and complexity that a safety critical system requires. In terms of the project and its complexity a radiotherapy machine with limited ram and specialized hardware that must automatically interface with a database would require higher values in the cost drivers. In terms of personnel working on the project, an experienced developer with knowledge of specialized hardware, knowledge of health systems and the ability to build reliable software would be desired but developers like this are rare. The more realistic approach would be to have a low to medium effort on the people working on the project but focus on extensive testing.
2. In a safety critical system, I feel that the key cost drivers would be Reliability (RELY), Complexity (CPLX), Documentation (DOCU) and Experience (EXPR). In a system like this I would adjust DOCU to 1.2-1.25 as a system used in the medical field would require extensive documentation for tracing back issues, specific applications for different patients and maintaining compliance to rules. I would adjust RELY to 1.15-1.2 as a system of this nature would require extensive testing to ensure reliable and flawless function. A faulty system could pose a threat to the health of patients if something went wrong. I would also adjust CPLX to be very high at 1.1-1.15, this is due to the complex nature of the system. Putting extensive effort into the system would be required as the limited memory, specialized hardware and the safety critical component must all work together. Finally, EXPR a range of 0.8-0.9 is the final and only negative change a team of specialized expert developers in the field of medical equipment are rare and hard to come by. A team of medium experience developers should be able to build the system as long DOCU and RELY make up for more common but less experienced developers. If we take the new maximum EMi by the initial estimate we find the new PM value is 40.4 with the minimum Emi the new PM value is 31.6 the average of 36 Person-Months requires and increase of 38% in effort
3. Upon considering some of the other factors of the system like the Maturity (MATR), Strict Quality Control (SCED), or project flexibility (PFLEX) I decided to keep them at 1 as project maturity would come from choosing a qualified development firm as well as being kept in check by DOCU and RELY. I chose to also keep SCED at 1 for the same reasons and it would lengthen the project timeline even further. As for project flexibility this system would be built once and changes would be unlikely to be made because each version would have to be recertified and go through rigorous testing after the final release.