Assignment questions:

1. What are the main reasons for the emergence of software testing?
2. What does software testing mean? And how it’s related to quality management?
3. Why is software testing considered to be an important part of software development? and what aspects could affect/limit the testing process?
4. What are the benefits of software testing?
5. At what stage of the software development process the NASA Mars climate orbiter failure could have been avoided? explain your answer?

1. Software was becoming too large and complicated, and the tools, techniques, and processes haven´t improved fast enough. Their size has grown to the point that one person could not handle them completely. The need for a process to control and avoid problems emerged, hence the birth of software testing.

2. The definition of software testing has changed over the years, but the primary principles remain that software testing is checking if a given software application does its given tasks in a correct manner. According to IBM (2022), software testing is the process of evaluating and verifying that a software product or application does what it is supposed to do¨.

Quality management includes software testing as software testing improves the general

final quality of the software. Testing is usually done in quality control phase, but also in assurance phase.

3. Software testing reduces costs caused by a fault before they enter the production phase of development. Insufficient testing leads to tremendous costs in production and liability compensations. If software testing is carried out properly and comprehensively, there will be a massive potential in savings. Fixing a problem during the earlier development phases is much cheaper than fixing it during production.

Software testing is often restricted by money, time, human resources, or other resources.

4. Software testing helps to discover faults, gives an estimate of the product’s quality, provides resources to improve the product and work process, eases the development phase by detecting potential errors. Testing in general adds more value to a software development project.

5. The NASA’s Mars Climate Orbiter failed because of man-made error: the software provided commands in English units, without being converted into metric units. Such failure should have been avoided relatively easy.

Many other factors culminated in the disaster, mostly related to insufficient testing. One of them was that a few months earlier, in April, a bug was fixed in the trajectory management software. At that time the need to use the new code in the mission was urgent. This meant there wasn’t enough time to thoroughly test the changes (Deguili.com, 2019).

By testing the software running and supporting the orbiter thoroughly and comprehensively, the disaster would not occur. These tests would have revealed the weaknesses and faults persisted in the system, enabling NASA to fix before the launch.

REFERENCES

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