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Quality in software engineering

Software engineering is a branch of engineering where the attention to detail is crucial, everything starts from the moment we gather the requirements and finishes when the project concludes and is delivered to the client. There is a concept that is fundamental throughout the entire software development process, and it is quality. Quality is what we have to consider during all the process and it is what measures if the products accomplish what the user wanted it to do.

In software engineering there are various ways to measure quality, there are quality tests, where these are intended to analyze those failures and/or errors present in the software, it also helps to gather information about the quality of the software, which favors the times that must be met with respect to the launch of the software, when doing quality test we have the opportunity to fix all the failures or error that the software may present immediately which helps to avoid errors by the end of the processes, this helps to guarantee the quality and also guarantees that there won't be extra costs in the project, something

that will make the final users feel confident and security at the moment of using the software, since it assures the fulfillment of each one of the user's needs by complying with each one of the proposed requirements.

About the quality in software development, it is vital to understand what are those quality attributes that must be considered to ensure the quality of the software, among these are the observable quality attributes and those unobservable. The observable attributes are defined by the owner of the project or the customer who is requesting the development, in these observable attributes we can find: performance tests, which are fundamental, because under this criterion it is possible to determine the stability, speed, scalability and response capacity that a software has under a certain load of tasks, in addition there is the security which is a fundamental component at the moment of developing a project, the security in the whole process of the software is fundamental to guarantee the confidence with each of the users uses and interactions with the software, This is why it must be verified from the initial phase of the project to work under a model in which continuous security checks are established throughout the project, here must be guaranteed tests in relation to authentication, authorization, confidentiality, integrity, accountability and availability tests, all this in order to ensure from the beginning that it will prevent access by unauthorized users, both to the program and to the stored data.

Continuing with the observable quality attributes, functionality must also be considered, where it must be guaranteed that the system performs each of the requirements for which it was intended, as well as reliability, understood as the extent to which the system must have the ability to be maintained over time without any failure. The external security is the measure of the absence of errors that generate information losses, while the internal security is the one where the system has the ability to resist attempts of use by external people, guaranteeing the non-authorization of access to the system. (Padilla, 2022).

Continuing with the unobservable quality attributes, we have several attributes such as: Modifiability, which is the ability to make future changes to the system quickly and inexpensively which helps with fast development, there is also integrability, which ensures that each of the components of the developed system are correctly integrated and work perfectly with each other, portability, which refers to the ability of the system to be executed in different systems and operating systems (Linux, Windows, MacOS) Finally, there is reusability, a concept understood as the capacity of the system to be used in future projects along the way, and finally, there is scalability, which refers to the capacity of adaptation and response of the software, in relation to the performance of the software project as the number of users increases, this helps with the increase of the projects size.

In regards to software engineering, it is of great importance to ensure the quality of the projects, which goes hand in hand with the attributes

mentioned above, but there is also a relevant aspect throughout the software development cycle and lies in the importance of testing, that is where testability comes into context, because it is at this stage of the software development process where the necessary tests must be performed to verify each of the needs of the project, and not only the needs but also the vulnerabilities or the way that we want the software to work, but before, it is necessary to know that the testing are those activities destined to evaluate the quality of the software where failures are detected, as well as validation and verification tests are designed, which go hand in hand with what was mentioned before, since it is verified that the development team has carried out correctly the system, all the previous activities are done by a tester who is a professional trained to carry out this type of activities and ensure that everything works correctly.

With respect to this phase of the development, a testing process is designed and deployed with a plan, where it is first necessary to model the software environment, it is in this phase where the environment in which the tests will be executed is identified and it is the task of the tester to simulate the interaction that the software will have with its environment, in order to identify those actors that will interact with the system and the possible interactions that they may have with it, in second instance there is the selection of test scenarios, for this different flows are represented based on those functional and non-functional requirements initially established with the client, After this,

the scenarios are executed and evaluated, for this stage the results obtained are evaluated with the expected ones, this is monitored and favors the attention to those that were not successful and must be corrected in order to guarantee the quality and to finish this process the progress of the tests must be measured by doing a series of tests for each and every scenario, which leads to monitor, report and control the process, since each of the activities performed must be measured and those tests that need corrective actions to be successful must be followed up.

Based on what was exposed and presented above, it is possible to conclude that the whole process of quality inside software engineering is crucial since it seeks to improve and guarantee the quality of the software product. It is noticeable that it is fundamental that, at the moment of applying software engineering, the quality must be a guarantee from the moment first moment that the project takes place all the way to the moment where the project is delivered to the customer, this because in case that the project does not fulfill the requirements established or it comes with any type of failure it would be bad for the customer and for the developments teams reputation and credibility.

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