Software quality is an extremely important principle whose processes must be applied at many stages in the software development life cycle, and the maintenance stage is no different. Software quality can be defined as “the degree to which a set of inherent characteristics fulfils requirements” [1]. Thus, software maintenance, which involves the changing or evolution of the software product after delivery and the surfacing of new user requirements, must also meet these quality standards to ensure these new requirements are met fully. An existing organisation can improve their software quality approach by improving quality management processes and encouraging a software engineering culture devoted to culture.

The software quality management (SQM) process defines ‘processes, process owners, and requirements for those processes, measurements of the process and its outputs, and feedback channels.’ [2]. The SQM processes consist of many different processes, some which will directly find defects and some which will show where further evaluation may be needed. The SQM processes include the quality assurance process, verification process, validation process, review process and audit process. While these processes may be implemented to some extent by the organisation currently, there is always room for improvement.

The first SQM process which would need to be implemented or improved would be the software quality assurance (SQA) process. This process includes the creation of a plan which details the quality requirements and the specific techniques that will used to achieve these. This document must contain great detail about the costs and resources required, the schedule the measures will operate on, and the overall management objectives. In regards to the organisations maintenance situation, they must create a detailed quality requirements list for future updates to the site as well as the processes they will implement to meet these requirements. This must be done in order to ensure the product satisfies the users requirements and is the pinnacle of quality possible within the given constraints.

Secondly, the verification and validation (V&V) process would need to be improved. These include activities which addresses the software product quality directly and uses testing techniques which can locate defects so that they can be addressed. They are methods to ensure the software product meets the requirements created (verification) and checks to see whether the product built to match these requirements actually fulfils its intended purpose (validation). The V&V document that the organisation must produce should be created in the early stages of the build of the next website update. It must contain the specific activities needed to carry out the verification and validation as well as the techniques and tools used to do so.

Reviews and audits are also another area which when improved would also improve the software quality approach of the organisation. The tasks concerned with reviews and audits can be broken down into five parts in order to be implemented: management reviews, technical reviews, inspections, walk-throughs and audits. Management reviews which determine the adequacy of plans and keep track of their progress will serve to ensure the development of the updates or adaptation to the site are moving in the right direction toward the goal. Technical reviews will allow for the team to identify if the build for the update or adaption to the site is in line with the approved specifications set out at the start of development. In addition, inspection which is a type of review to ascertain anomalies in the software product will be employed to improve the quality of the product. Walk-throughs, similar to inspections. provide an evaluation of the product, only now in a less formal setting than inspections. Lastly, audits carried out by independent bodies can be used to give an unbiased look at the new builds to check nonconformance levels and produce a report detailing how to take corrective action. Whether all or some of these methods are employed the quality approach of the organisation will definitely be improved as many different aspects of the product are checked for defects which can then be resolved to ensure quality.

Lastly, the organisation can improve their approach to software quality by developing a healthy software engineering culture which encourages a commitment to quality [3]. If engineers developing the software have a focus on quality as they develop, the end product will meet a greater standard. Therefore, the engineers should follow the code of ethics and professional practice created by the IEEE Computer Society and the ACM and the eight principles they outline in order to help build or reinforce the attitudes required to generate updates and alterations to the website in a quality fashion consistently.

In conclusion, by improving the software quality management processes and the culture of their developers the organisation would be able to substantially improve their quality approach which ensures the quality of the updates and adaptation built in the maintenance phase of their website development are of top quality.

References:

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