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Software Quality Assurance and Security

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ABSTRACT

This paper focuses on the development of a quality assured software, it shows the importance of software reviews in the software development process and also how indispensable security is to software development; any software with no security is vulnerable. Therefore, this paper recommends that software should be developed in a very well defined way; using strict sequence of methodological steps, in a formal and systematic way. It should be noted that quality is the responsibility of a product and security is a part of the totality of quality of a system.

KEYWORDS: Computer Software development, Software Quality Assurance, Security

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INTRODUCTION

Computer Software is the product that software professionals build and then support over the long term;" this confirms the fact that software development is an endless process"(Dr. Jimoh R.G Computer Science Department, University of Ilorin, Nigeria). It encompasses programs that executes within a computer of any size and architecture, content that is presented as a computer programs, execute, and descriptive information in both hardcopy and virtual forms that encompasses virtually any electronic media. Software development entails a process, a collection of methods (practice) and an array of tools that allows software engineers to build high quality computer software.

Quality has been defined as: "The totality of features and characteristics of a product or

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service that bear on its ability to satisfy stated or implied needs.

Assurance on the other hand refers to as having a level of confidence.

Security is defined by the American Heritage Dictionary in their on-line database as: 1) Freedom from risk or danger; safety; 2) Freedom from doubt, anxiety, or fear; confidence; 3) Something that gives or assures safety,

Therefore, in this sense, **Software Quality Assurance** (SQA) is the level of confidence that software functions as intended and is free of vulnerabilities, either intentionally or unintentionally designed or inserted as part of the software throughout the life cycle; coupled with the security advantage that serves as a component of quality. It is necessary to select and follow a formal practice for software development is to provide desired discipline to deliver the quality expected for business success and avoiding the wastage of time, squander productivity, demoralization in developers, etc. This paper summarizes the need for adopting systematic formal software development methodology standard together with some security tips to be used during the process of software development.

SOFTWARE DEVELOPMENT

➢ An Engineering Task to Building Software

Software development can also mean the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; i.e. the application of engineering to software. This make software development to be a layered technology, any engineering approach must rest on an organizational commitment to quality and total quality management in which security plays a vital role.

In the discussion on software development, the importance of the Software Development Life Cycle (SDLC) cannot be overemphasized. It is a great determinant to the success and quality assurance of computer software. The software development is successful; when it meets the needs of the people who use it, when it performs flawlessly over a long period of time, when it easy to modify and even easier to use, It can and does change things for the better. But software fails; when its users are dissatisfied, when it is error prone, when it is difficult to change and even harder to use, Bad things can and do happen. It is good to build software that makes things better, avoiding the bad things that lurk in the shadow of failed effort. To succeed,

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discipline is needed when the software is designed and build, an engineering approach is needed.

- **Application of Standard in the Software Development for Software Quality Assurance**

In the past, the methods and principle of design software is informal, and kind of traditional. Years back, definitions are left for intuitions, and there are many lapses, this make the software development not to be formal.

This was more obvious at the point in which the development of software increases with complexities and ambiguity, informalities shows to be the major reason of failures. To enhance software standard, systematic review approach could be used.

Systematic reviews sometimes use a technique called meta-analysis to pool together results from a number of different trials, i.e. works done by other software developers in other to make a compare and contrast. Systematic review is a step further to a normal review. It is a guideline to the development of standard and quality assured software where intuition is not really needed.

- **Systematic Review approach on Software development**

- It would be impossible for anyone to keep up with all the developments in even quite a narrow sense but a systematic review can summarise the best-available evidence and produce a conclusion to help developers make the right choice of designing very well defined software with quality assurance.
- Systematic reviews also exclude poor-quality trials from their analyses guaranteeing that any research that has been analyzed is of a high quality.
- It helps to draw up guidelines for a developing a standard software
- It help to prevent duplication of effort and avoid wasting resources on searching for standards where the evidence is already clear

Much of what goes into security is not difficult, but does require discipline and vigilance. Maintaining quality of any type requires the same discipline. Putting procedures into place to support the quality and security of technology implementations builds this vigilance into the overall work structure.

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SECURITY TIPS

Maintaining Software Quality Assurance in Software Development

• Integrating Security into the Software Development Life Cycle

•Key Practices for Mitigating the Most Egregious Exploitable Software Weaknesses

•Risk-based Software Security Testing

•Requirements and Analysis for Secure Software

•Architecture and Design Considerations for Secure Software

•Secure Coding and Software Construction

•Security Considerations for Technologies, Methodologies & Languages

Software Security Test Techniques throughout SDLC

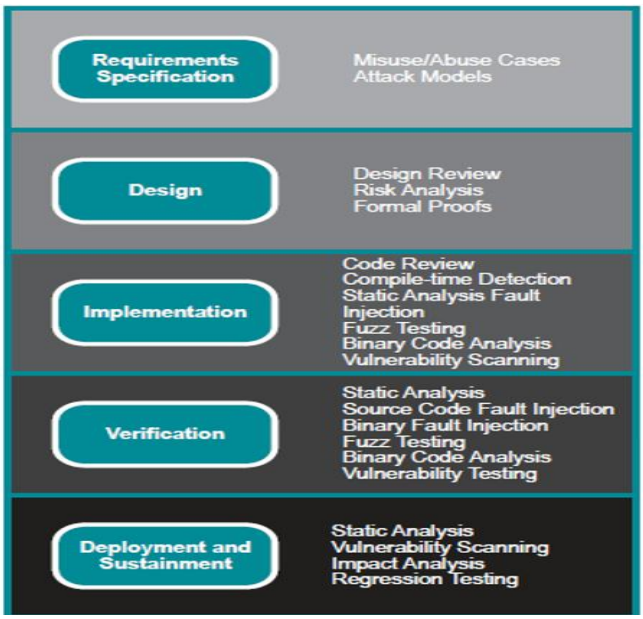

FIG 1: Software Security Test Techniques Throughout SDLC

Secure Coding

In other to enhance the quality assurance of software, security is very paramount, and security has to be put into consideration along side with the software development processes. The following steps are to be put in place.

- Preparing to Write Secure Code
- Secure Coding Principles
- Secure Coding Practices
- Secure Memory and Cache Management
- Secure Error and Exception Handling

Software engineers, Quality assurance and Security engineers can form a cooperative alliance to come up with a standard innovation on Software development to support business strategy. With security and quality as part of the way a company does business, a core attention can be spent on profitably meeting the customers' needs and expectations.

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CONCLUSION

The conclusion of this paper in a nut shell can be stated that software development needs to be developed with qualitatively with the mind of producing high quality software products with security. It should be noted that building software without accounting for security is no longer an acceptable risk. Security is a form of quality assurance at its basic level. A security exposure in any form is a quality assurance issue.

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