

Evaluating engineering software quality

Overview

This standard identifies the competences you need to evaluate software quality as part of the product definition activity, in accordance with approved procedures. You will be given a detailed brief, and will be required to assess these requirements and to extract all necessary information in order to carry out this activity. You will need to select the appropriate software method to use, based on the project requirements. You will be expected to use current British, European, international and company standards to measure the software quality.

Your responsibilities will require you to comply with organisational policy and procedures for working in the software development team. You will be required to report any problems with the computer hardware, software or procedures that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will be expected to work to verbal/written instructions and draft specifications, with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to measuring software quality. You will understand the computer system and software used, and its application, and will know about the various tools and techniques used to measure all aspects of software quality.

You will understand the safety precautions required when working in the software development team. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

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Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety legislation, regulations, directives and other relevant guidelines
2. plan the software quality evaluation activities before you start them
3. use appropriate sources to obtain the required information for the evaluation activities
4. access and use the correct software components
5. use appropriate techniques to create the software tests
6. use references that follow the required conventions
7. apply the appropriate quality measurement techniques
8. check the output from the quality reviews
9. save and store the software quality results as the appropriate file type and in the correct location
10. review the software analysis and report your findings
11. deal promptly and effectively with problems within your control, and seek help and guidance from the relevant people if you have problems that you cannot resolve

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Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken when working in a software quality measuring environment (to include such items as safety guidance relating to the use of visual display unit (VDU) equipment and work station environment such as lighting, seating, positioning of equipment; repetitive strain injury (RSI); the dangers of trailing leads and cables; how to spot faulty or dangerous electrical leads, plugs and connections)
2. the importance of good housekeeping arrangements (such as cleaning down work surfaces; putting media, manuals and unwanted items of equipment into safe storage; leaving the work area in a safe and tidy condition)
3. the relevant sources and methods for obtaining any required technical information relevant to the software quality measurement (such as new model brief/request, drawing briefs, specification sheets, request for changes or modifications to code; technical publications; calculations; software requirements; audit reports)
4. software quality standards and levels
5. software quality methodologies: national, international and relevant company software procedures
6. software quality measurements
7. the collection and use of software metrics
8. the need for configuration control on all components (such as ensuring that completed results are approved, labelled and stored on a suitable storage device)
9. why it is necessary to liaise with other engineers to establish software qualities
10. when to act on your own initiative, and when to seek help and advice from others

Scope/range related to performance criteria

1. Prepare for the software quality evaluation activities by carrying out **all** of the following:
 1. check that the working environment is in a safe and suitable condition and that all working equipment is in a safe, tested and usable condition (such as cables undamaged, correctly connected, safely routed)
 2. identify an appropriate software metric (such as lines of code, software test coverage)
 3. set up the analysis environment
 4. identify the relevant software code to be analysed
 5. identify the relevant software process to be reviewed
 6. identify the required standards and all relevant sources (such as software requirements, design and software coding standards)
2. Use **three** of the following as sources of data to collect software metrics:
 1. change order/modification requests
 2. software design
 3. process and quality documents
 4. software analysis
 5. software requirements
 6. code
 7. standards reference documents
 8. testing tools
 9. technical notes
3. Carry out **all** of the following before measuring software quality:
 1. ensure that the data and information you have is complete and accurate
 2. analyse the data and information to identify requirements of the quality analysis to be performed
 3. recognise and deal with problems (such as technical issues and lack of information, or incorrect, information)
4. Collect metrics, as required by **one** of the following:
 1. BS or ISO standards and procedures
 2. customer (contractual) standards and requirements
 3. company standards and procedures
 4. recognised compliance agency/body's standards

5. other accepted international standards
5. Review the quality metrics for **all** of the following:
 1. completeness
 2. traceability
 3. accuracy
6. Save and store the results in appropriate locations, to include carrying out **all** of the following:
 1. check that the results are correctly titled, referenced and annotated
 2. ensure that the results have been checked and that it complies with the company procedure
 3. save the results to an appropriate location (such as storage device, configuration database)
 4. ensure a separate backup copy is created and placed in safe storage
7. Review the findings of the software analysis, using **two** of the following:
 1. formal report
 2. software quality report
 3. metrics report
 4. software vendor code assessment

Behaviours

Additional Information

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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