

Topic #1 – Software Problem Management

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TOPIC #1 – SOFTWARE PROBLEM MANAGEMENT

What Is A Software Error?

Software Problem Classification

Defects, Faults, Failures, and Errors

Software Problem Reporting

Software Problem Management



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What is a software error?

Definition #1:

“A mismatch between the program and its specification is an error in the program if and only if the specification exists and is correct.”

Definition #2:

“A software error is present when the program does not do what its end user reasonability expects to do.” (Myers, 1976)

Definition #3:

“There can never be an absolute definition for bugs, nor an absolute determination of their existence. The extent to which a program has bugs is measured by the extent to which it fails to be useful.

This is a fundamentally human measure.” (Besizer, 1984)





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Mistake, Fault, Failure, and Error

Mistake

- A human action that produces an incorrect result.

Fault [or Defect]

- An incorrect step, process, or data definition in a program.

Failure

- The inability of a system or component to perform its required function within the specified performance requirement.

Error – the difference between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition.





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A Classification of Software Errors

- User interface errors, such as output errors, incorrect user messages.
- Function errors
- Defect hardware
- Incorrect program version
- Testing errors
- Requirements errors
- Design errors
- Documentation errors
- Architecture errors
- Module interface errors
- Performance errors
- Error handling
- Boundary-related errors
- Logic errors, such as calculation errors
- State-based behavior errors
- Communication errors
- Program structure errors, such as control-flow errors



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Problem Reporting

Whenever a bug or problem is found, we need to write down a problem report immediately.

What are the content of a problem report?

Problem ID **current software name** **release no. and version no.**

Test type **Reported by** **Reported date** **Test case ID**

Subsystem (or module name) **Feature Name (or Subject)**

Problem type (REQ/Design/Coding, ...) **Problem severity (Fatal/Major/Minor, ..)**

Problem summary and detailed description:

Cause analysis **How to reproduce?** **Attachments**



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Problem Reporting

How to track, control, and manage issued problems?

- Systematically track and maintain reported problems in a repository.
- Define & implement a problem management process for problem analysis.

Characteristics of a problem report:

- Simple and understandable
- Traceable and numbered
- Reproducible
- Non-judgmental

Problem analysis:

- Finding the most serious consequences
- Finding the simplest and most general conditions
- Finding alternative paths to the same problem
- Finding related problems



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Software Problem Management Process

