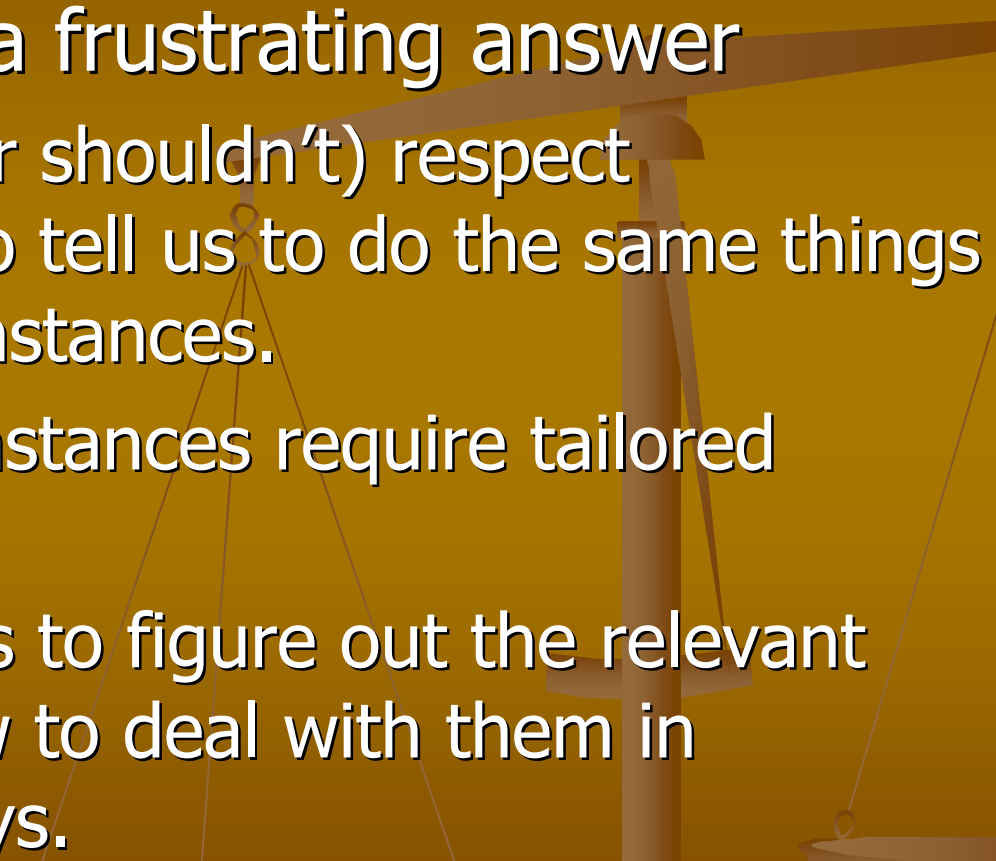


The Context-Driven Approach to Software Testing

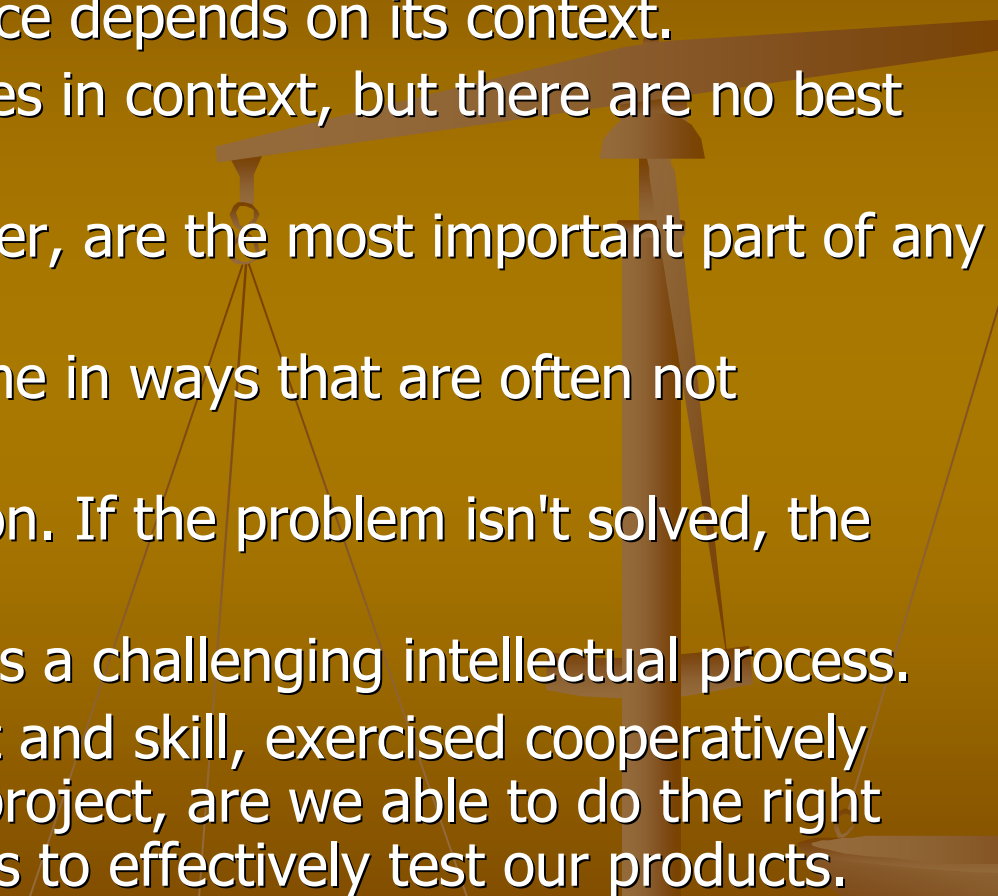


Cem Kaner, J.D., Ph.D.
Professor of Computer Sciences
Florida Institute of Technology
Star East
May 17, 2002

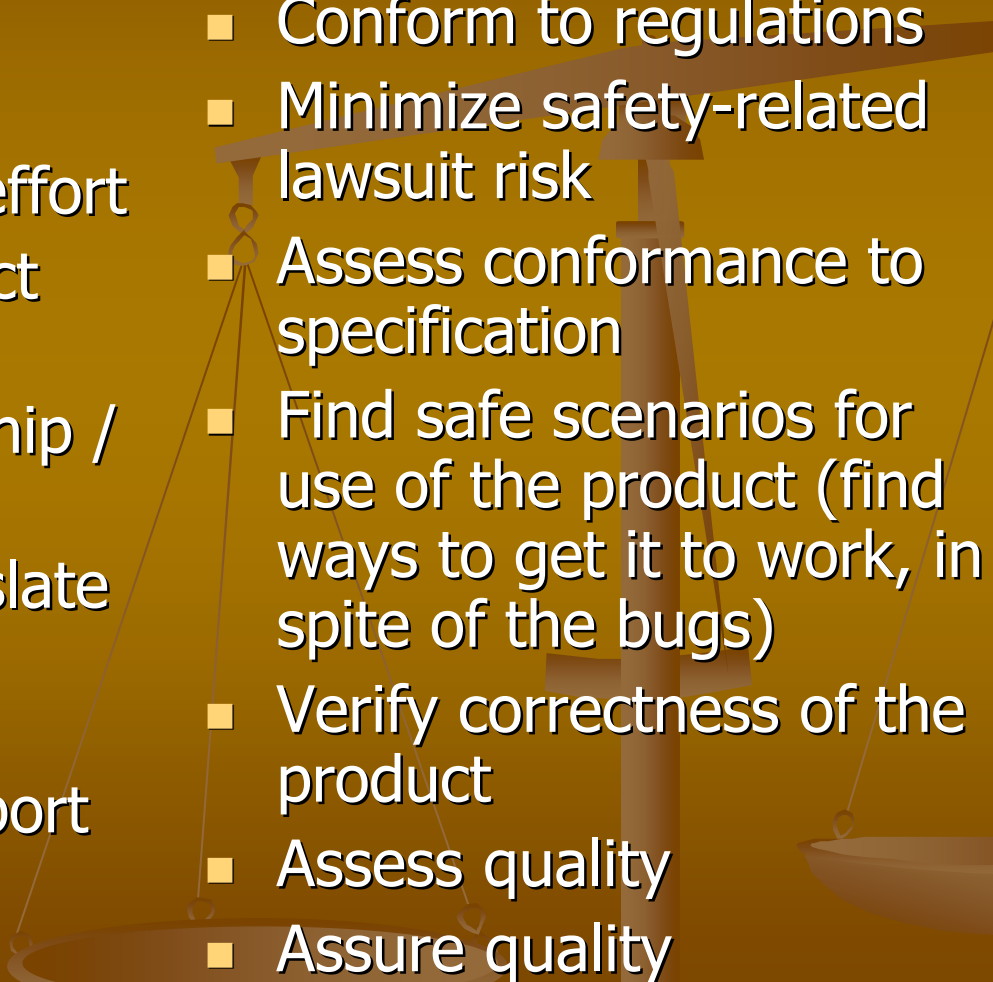
Context: “It Depends”

- “It depends” is a frustrating answer
 - But we don’t (or shouldn’t) respect consultants who tell us to do the same things under all circumstances.
 - Complex circumstances require tailored responses.
 - The challenge is to figure out the relevant factors and how to deal with them in appropriate ways.
- 

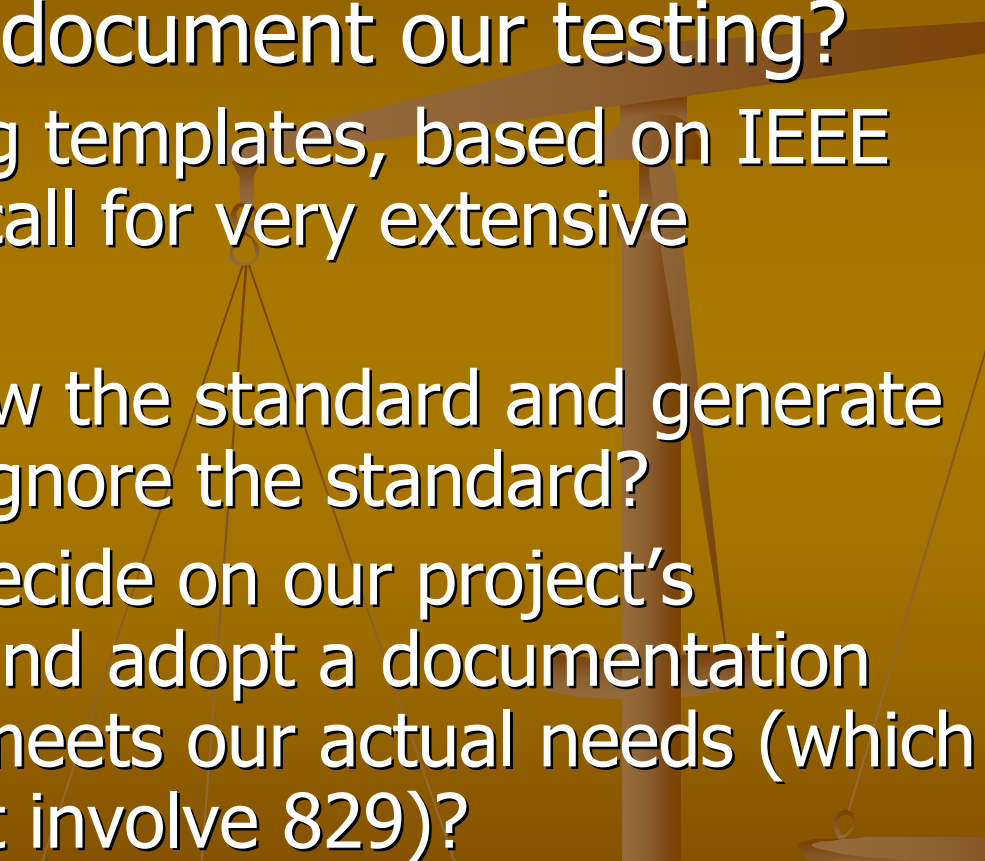
The Seven Basic Principles of the Context-Driven School

- The value of any practice depends on its context.
 - There are good practices in context, but there are no best practices.
 - People, working together, are the most important part of any project's context.
 - Projects unfold over time in ways that are often not predictable.
 - The product is a solution. If the problem isn't solved, the product doesn't work.
 - Good software testing is a challenging intellectual process.
 - Only through judgment and skill, exercised cooperatively throughout the entire project, are we able to do the right things at the right times to effectively test our products.
- 

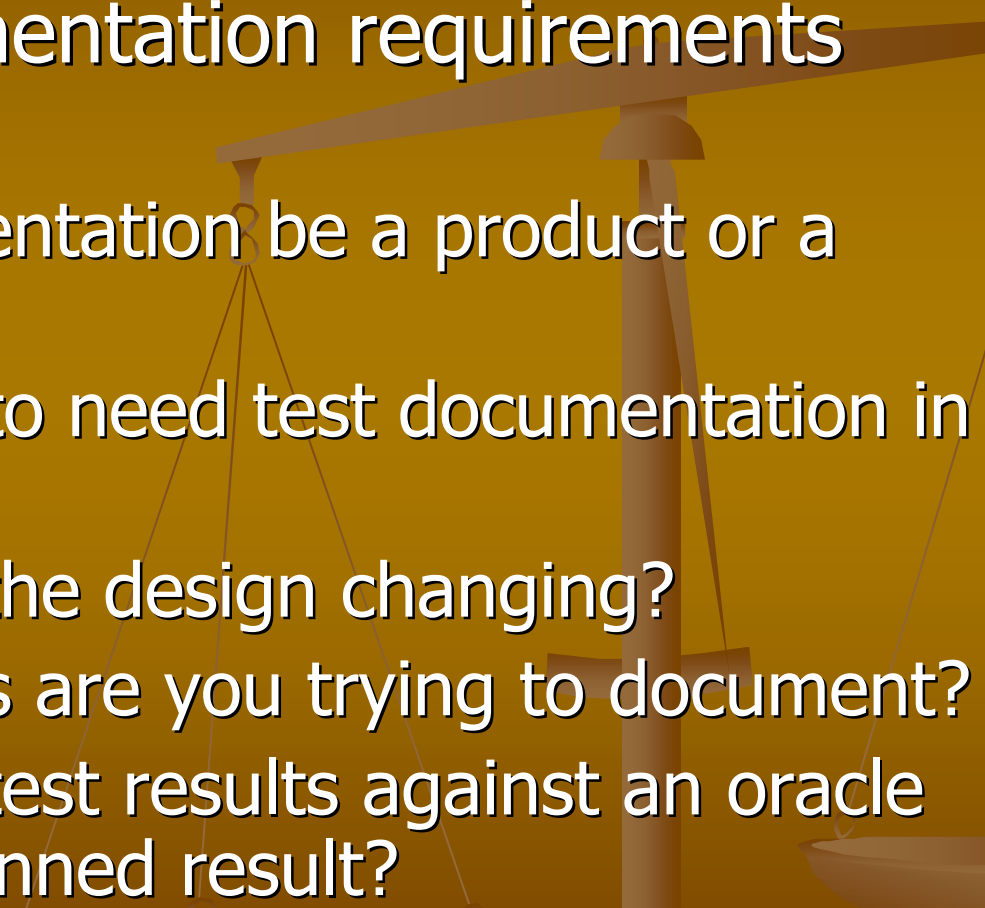
Example: Test Group Missions

- 
- Find defects
 - Maximize bug count
 - Support a unit testing effort
 - Block premature product releases
 - Help managers make ship / no-ship decisions
 - Help stakeholders translate their requirements into acceptance tests
 - Minimize technical support costs
 - Conform to regulations
 - Minimize safety-related lawsuit risk
 - Assess conformance to specification
 - Find safe scenarios for use of the product (find ways to get it to work, in spite of the bugs)
 - Verify correctness of the product
 - Assess quality
 - Assure quality

Example: Test Documentation

- How should we document our testing?
 - Common testing templates, based on IEEE Standard 829, call for very extensive documentation.
 - Should we follow the standard and generate all the paper? Ignore the standard?
 - Or should we decide on our project's requirements, and adopt a documentation approach that meets our actual needs (which may or may not involve 829)?
- 

Example: Test Documentation

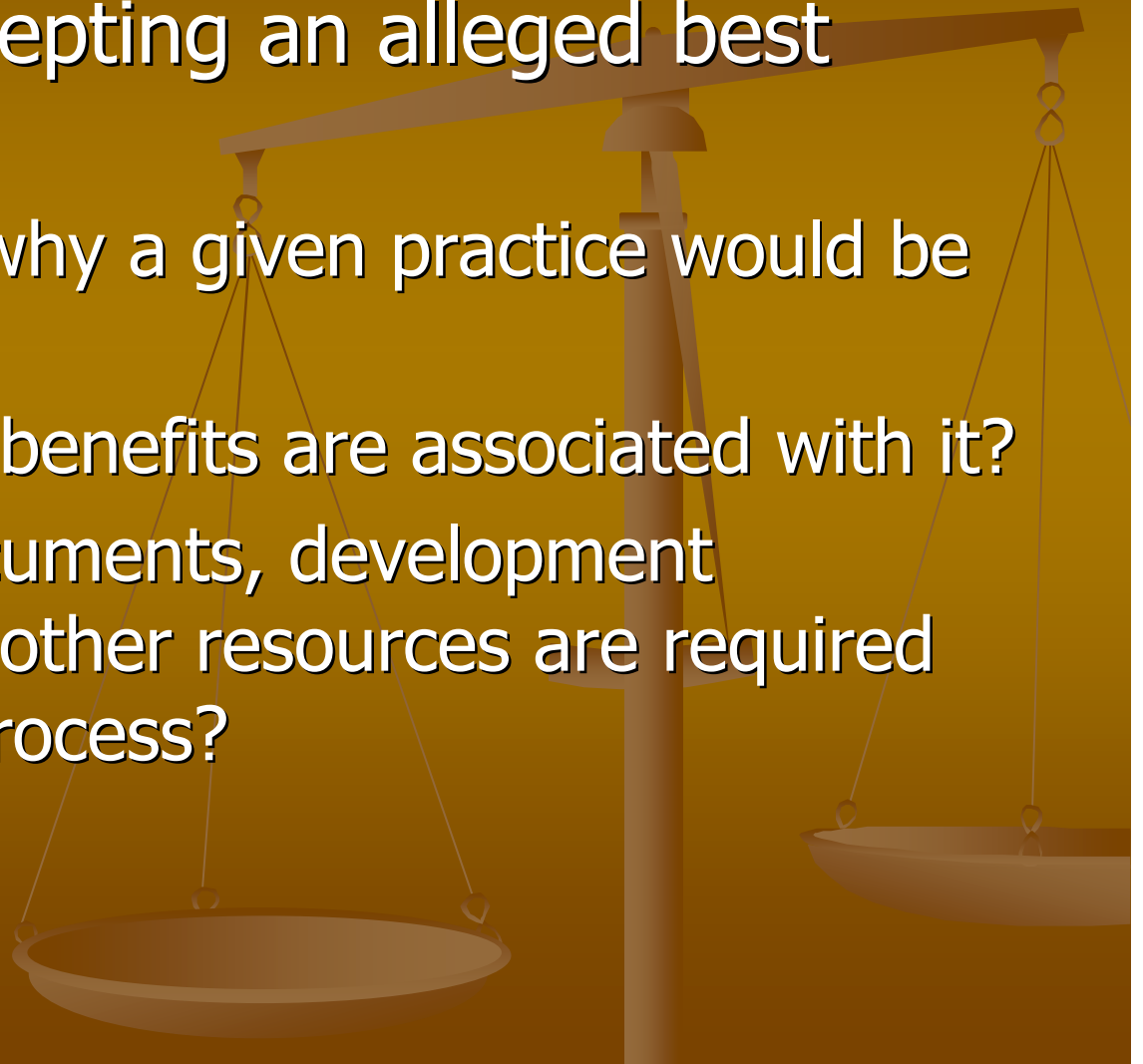
- Common documentation requirements questions:
 - Will the documentation be a product or a tool?
 - Do you expect to need test documentation in lawsuits?
 - How quickly is the design changing?
 - How many tests are you trying to document?
 - Will you check test results against an oracle or against a planned result?
- 

Example: GUI Regression Automation

- Will the user interface of the application be stable or not?
- To what extent are oracles available?
- To what extent are you looking for delayed-fuse bugs (memory leaks, wild pointers, etc.)?
- Does your management expect to recover its investment in automation within a certain period of time? How long? How easily can you influence these expectations?
- For more, see “Architectures of Test Automation” www.kaner.com/testarch.html and “Avoiding Shelfware” <http://www.kaner.com/pdfs/shelfwar.pdf>.

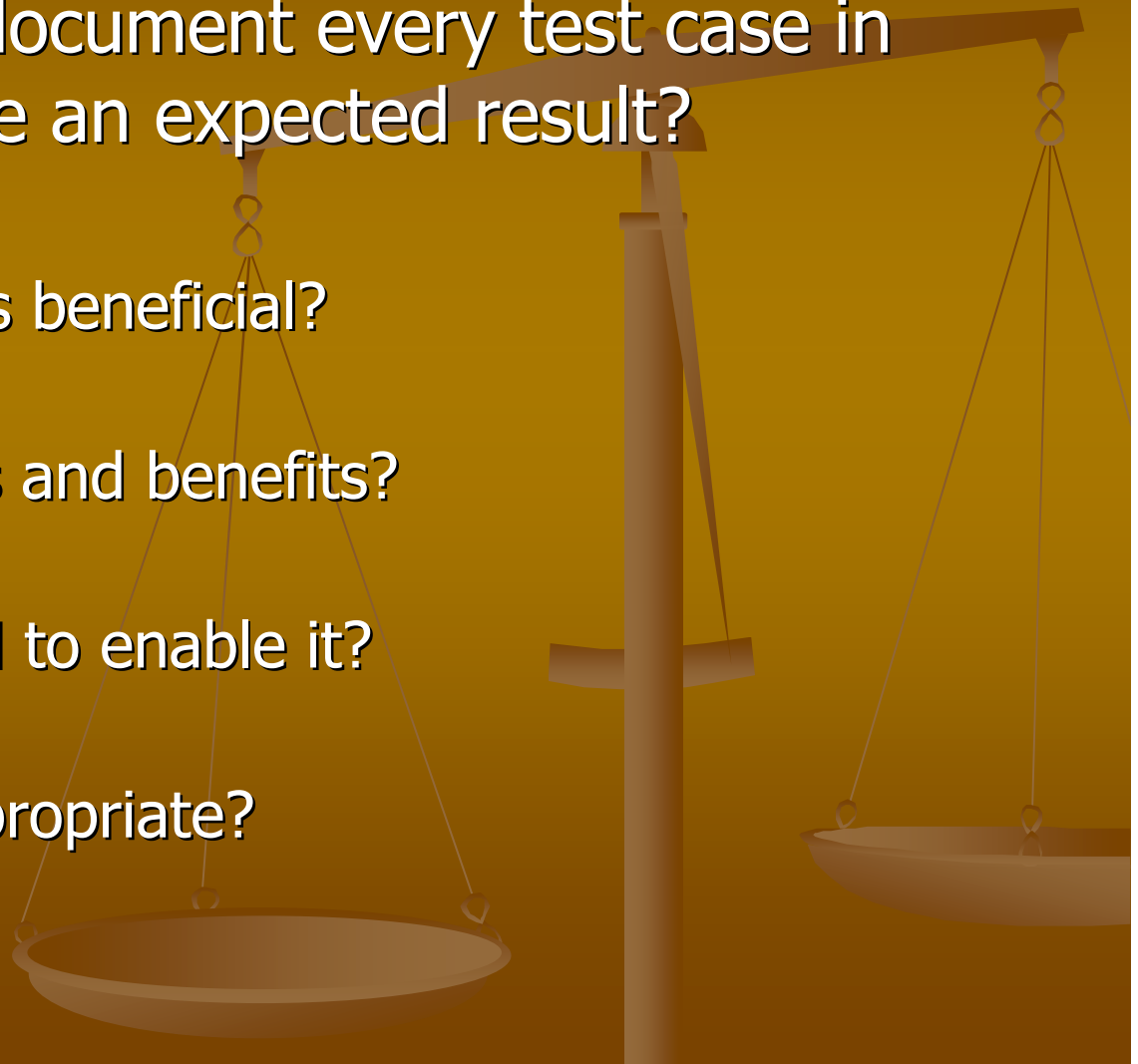
Best Practices?

- Rather than accepting an alleged best practice:
 - Ask when and why a given practice would be beneficial?
 - What risks and benefits are associated with it?
 - What skills, documents, development processes, and other resources are required to enable the process?



A Best Practice?

- Should we *really* document every test case in writing and include an expected result?
 - When / why is this beneficial?
 -
 - What are the risks and benefits?
 -
 - What do you need to enable it?
 -
 - When is this inappropriate?
 -

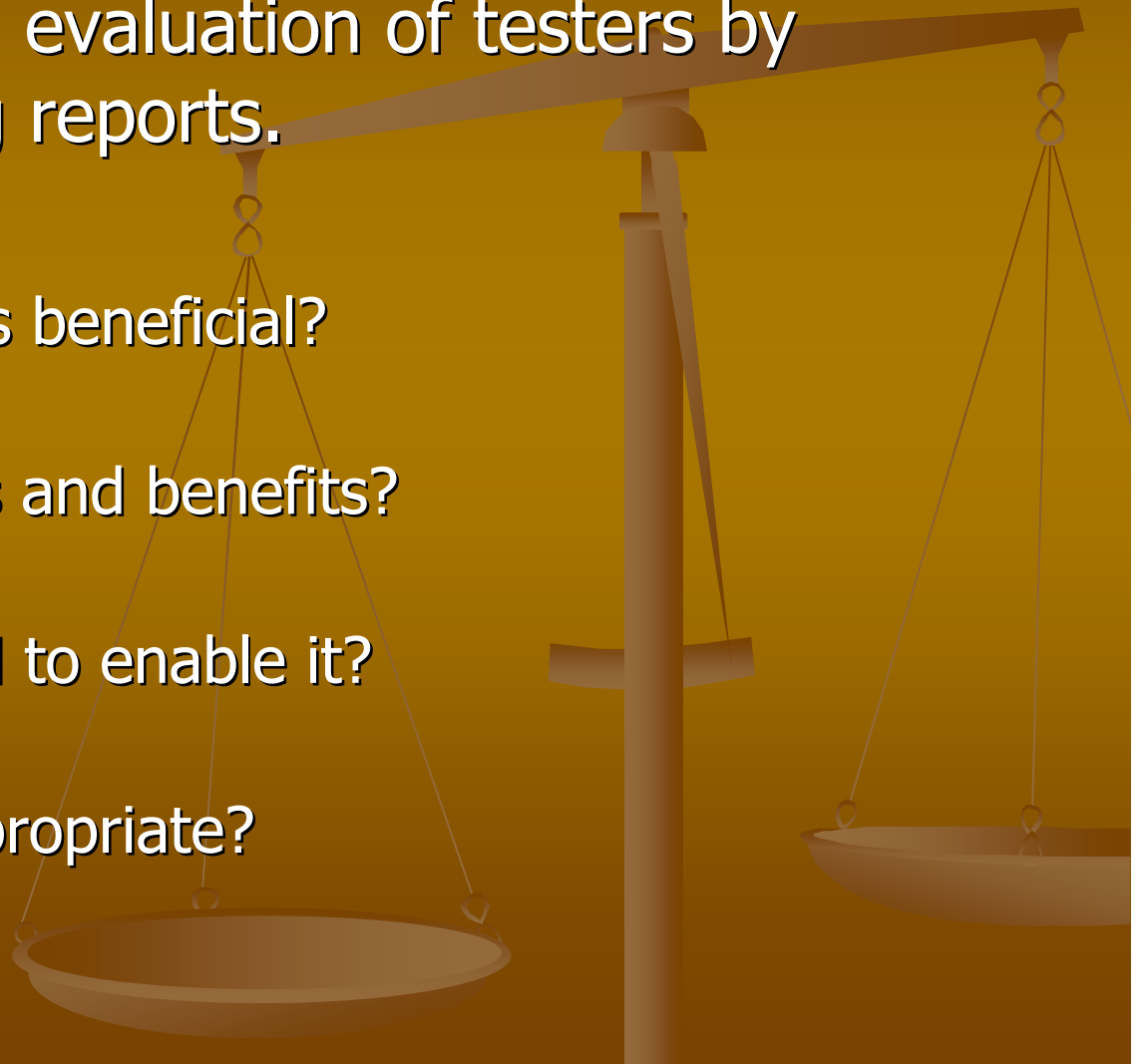


Bad Practices?

- Sometimes, people will suggest practices that seem “obviously” bad.
 - You might (perhaps reasonably) conclude that the person is an idiot.
 - You might (more productively) ask why this practice seems useful to this person.
 - When would it be beneficial?
 - What are its risks and benefits?
 - What do you need to enable it?
 - When is it inappropriate?

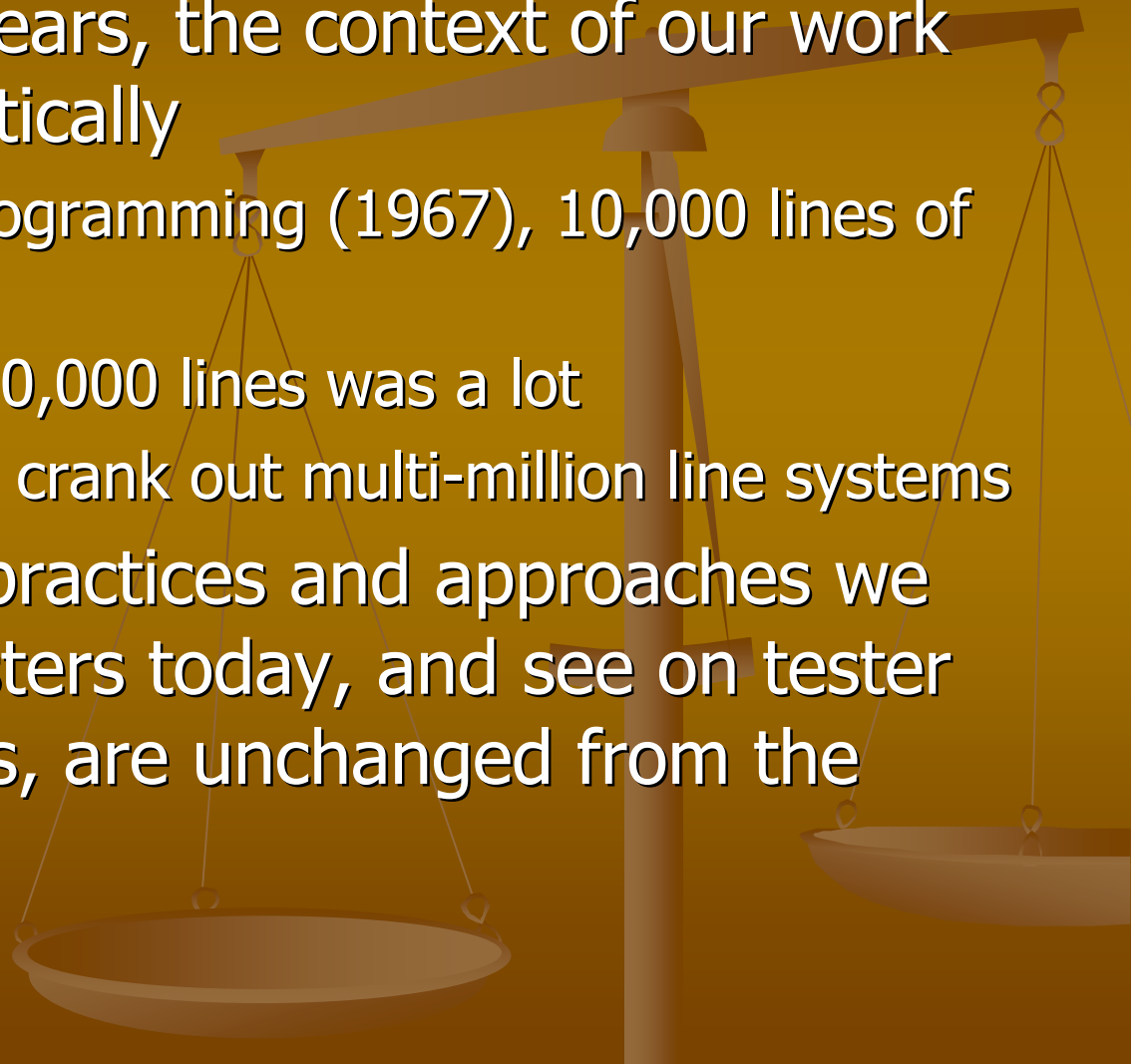
An Obviously Bad Practice

- Let's do personnel evaluation of testers by counting their bug reports.
 - When / why is this beneficial?
 -
 - What are the risks and benefits?
 -
 - What do you need to enable it?
 -
 - When is this inappropriate?
 -

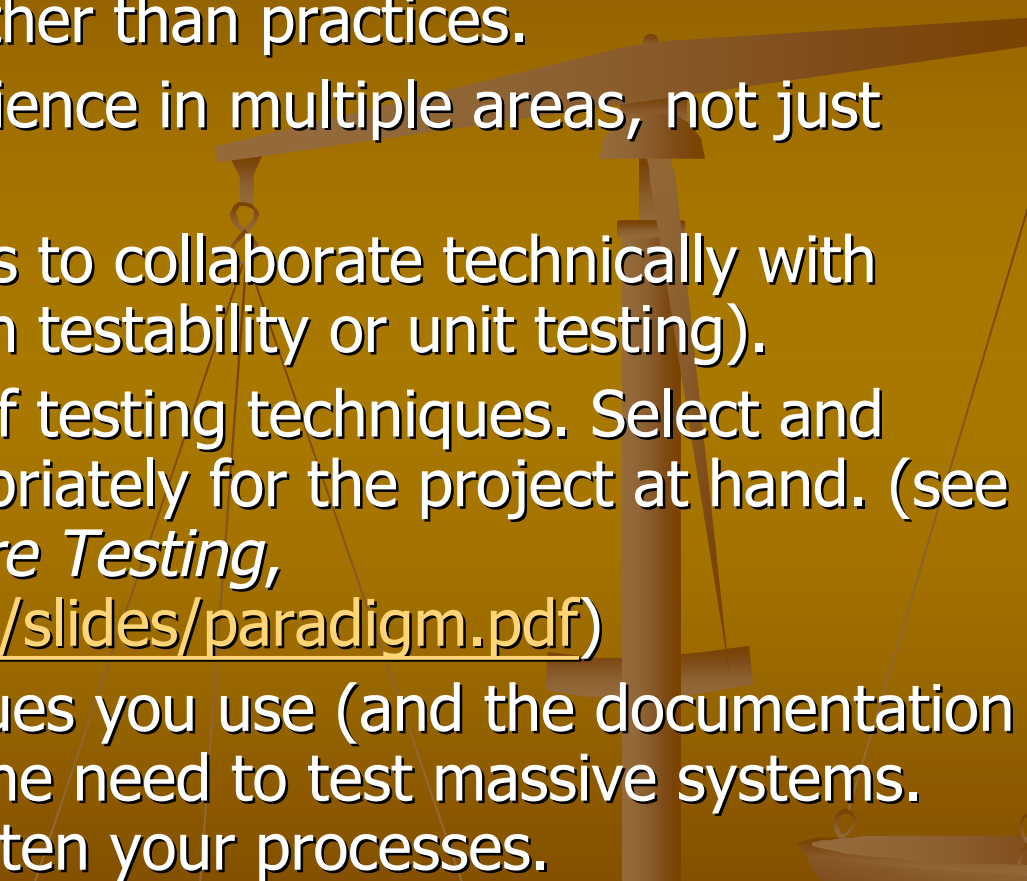


We Must Reappraise

- Over the last 30 years, the context of our work has shifted dramatically
 - When I started programming (1967), 10,000 lines of code was a lot
 - In early 1980s, 100,000 lines was a lot
 - Now, we routinely crank out multi-million line systems
- Yet, many of the practices and approaches we recommend to testers today, and see on tester certification exams, are unchanged from the 1980's.



Reappraisal (Some Thoughts)

- Study / train skills rather than practices.
 - Build skills and experience in multiple areas, not just testing.
 - Look for opportunities to collaborate technically with programmers (e.g. on testability or unit testing).
 - Learn a wide range of testing techniques. Select and combine them appropriately for the project at hand. (see *Paradigms of Software Testing*, www.kaner.com/pdfs/slides/paradigm.pdf)
 - Appraise the techniques you use (and the documentation you create) against the need to test massive systems. You may need to lighten your processes.
- 

The Seven Basic Principles of the Context-Driven School

- The value of any practice depends on its context.
 - There are no best practices.
 - People, working together, are the most important part of any project's context.
 - Projects unfold over time in ways that are often not predictable.
 - The product is a solution. If the problem isn't solved, the product doesn't work.
 - Good software testing is a challenging intellectual process.
 - Only through judgment and skill, exercised cooperatively throughout the entire project, are we able to do the right things at the right times to effectively test our products.
- 