

Dig the SPACEDIRT

"To fail to plan, is to plan to fail". IEEE 829 is arguably still the most used software testing standard."

"Why standards? The use of standards simplifies communication, promotes consistency and uniformity, and eliminates the need to invent yet another (often different and even incompatible) solution to the same problem. Standards, whether 'official' or merely agreed upon, are especially important when we're talking to customers and suppliers, but it's easy to underestimate their importance when dealing with different departments and disciplines within our own organisation. They also provide vital continuity so that we are not forever reinventing the wheel. They are a way of preserving proven practices above and beyond the inevitable staff changes within organisations." [Ed Kit - *Software Testing in the Real World*]

That paragraph neatly and (quite) succinctly describes why standards exist. But how does that affect testing practitioners who live, as in the title of Ed Kit's book, in the real world?

Anything that promotes better project communication has to be good for testers. Standards have, therefore, to be effective and produce recognisable (and

measurable?) gains while not adding disproportionate overheads. I once worked for a large organisation that had an internal (and mandatory) standard for almost all documents. It was such that its use transformed a document of 200 real words into 18 pages after all the necessary parts ('glossary', 'associated documents', etc) were added. Perhaps this was counterproductive and unnecessary.

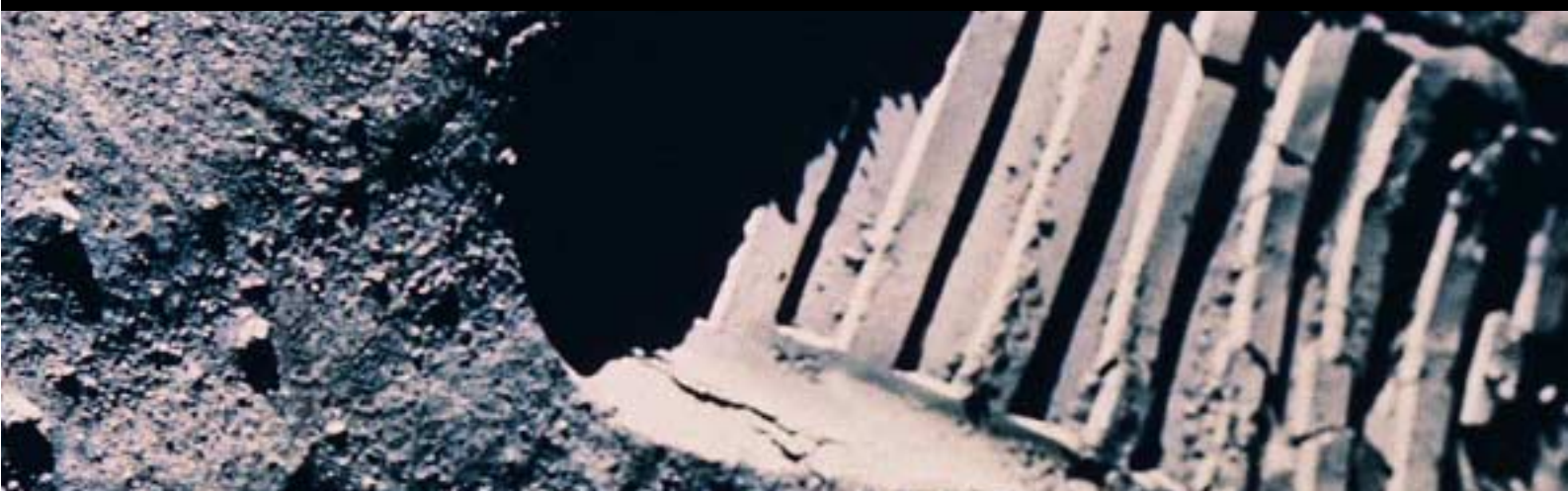
An overview of IEEE 829

There have been diverse document types used in software testing, developed in many cases for the needs of a particular organisation. IEEE 829 (1983) - the **Standard for Software Test Documentation** - was an attempt to pull sources together and present some best practice ideas. The standard was revisited and revised in 1998. Please note that the standard applies to any level of testing that may take place, including acceptance testing, although its application in agile development methodologies may be less obvious. It is usual to have 'a full set' of IEEE 829 documents for each testing stage that is to be undertaken.

IEEE 829 is often thought of as being the standard for a "High Level Test Plan" or "Master Test Plan" (**HLTP or MTP**). It is more than this, as the standard describes eight documents that can be produced as part of the testing effort. These documents are sometimes distributed between different categories and although there is no consensus on the subdivisions, I find the following partitioning helpful:

- **Test Planning**
 - Test Plan
- **Test Specification**
 - Test design specification
 - Test case specification
 - Test procedure specification
- **Test Reporting**
 - Test Item transmittal report
 - Test log
 - Test incident summary
 - Test summary

Most of these eight document types are well known, but figure 1 (opposite) provides a very brief summary.



Test planning revisited

Test planning is a key activity in any software testing project and for that reason many would associate IEEE 829 *only* with test planning. The standard defines 16 items that should be considered for an MTP, including the key activities of estimation ('schedule' is one of the 16) and risk, both of which are large topics in their own right.

The 16 are given below for completeness together with a well-known mnemonic (SPACEDIRT) for remembering the list; more detail on each can be found in textbooks and on web sites that deal with this subject:

S Scope	test items, what to test, what not to test
P People	training, responsibilities, schedule
A Approach	the approach that will be taken to testing
C Criteria	entry/exit criteria, suspension/resumption criteria
E Environment	test environment needs
D Deliverables	what is being delivered as part of the test process
I Incidentals	introduction, identification (of the document), approval authorities
R Risks	risks and contingencies
T Tasks	the test tasks that are involved in the testing process.

It is worth noting at this point that the standard lists as 'deliverables' the seven other document types that perform part of the standard. Some organisations add to this basic list by including key items such as 'glossary' and 'references' to other documents. I usually keep MTP documents from previous projects and for projects that I worked on for other organisations, so that I can look back and see what specific details were included.

MTP is a LIVING document

This document specifies what is going to be done and how it is going to be done. It needs to be published, to appropriate people, to make others aware of what is - and what is not - going to be tested. However, don't wait for everything to be completed before the document is circulated for comment and/or review. The MTP will change during the life of the project, but this does not mean that

it is unnecessary to obtain individual and departmental sign-off; sign-off is achieved based on what is known at the time. In one organisation, sign-off is achieved by stating that unless this is received by a specified (and realistic) date, it will be assumed. It is remarkable how that concentrates the minds of those concerned!

Two areas that indicate the dynamic nature of the MTP concern schedules and risks. During the testing phase, good news and bad news can act to change priorities. Does this mean that the original MTP was wrong? No; the MTP is what its name suggests, just a plan. At the time, it was based on the best available information, incomplete though this was. Information will improve as testing progresses; for example, what was once a critical risk might now have been addressed (e.g. by third-party security testing). The risk is now answered and will possibly require no further action.

Figure 1 The eight parts

Test Plan	A high level view of how testing will proceed; WHAT is to be tested, by WHOM, HOW, in what TIME frame, to what QUALITY level.
Test Design Spec	Details the test conditions to be exercised, with the expected outcome (in general terms).
Test Case Spec	Specific data requirements to run tests, based upon the test conditions identified.
Test Procedure Spec	Describes how the tester will physically run the test, including set up procedures. The standard defines ten procedure steps that may be applied when running a test.
Test Item Transmittal	The recording of when individual items to be tested have been passed from one stage of testing to another. This includes where to find such items, what is new about them, and is in effect a warranty of 'fit for test'.
Test Log	Details of what tests were run, by whom, and whether individual tests passed or failed.
Test Incident Summary	Details of instances where a test 'failed' for a specific reason.
Test Summary	The Test Summary brings together all pertinent information about the testing, including the number of incidents raised and outstanding, and crucially an assessment about the quality of the system. Also recorded for use in future project planning is details of what was done, and how long it took. This document is important in deciding whether the quality of the system is good enough to allow it to proceed to another stage. This assessment is based upon detailed information that was documented in the Test Plan.



Figure 2 Relationship to other standards

These are some of the other standards that may be referred to when documenting according to IEEE 829:

- IEEE 1008 - Standard for Unit testing
- IEEE 1028 - Standard for Software Reviews
- IEEE 1044 - Standard Classification for Software Anomalies
- IEEE 1044-1 - Guide to Classification for Software Anomalies
- BSS 7925-1 - Vocabulary of Terms in Software Testing
- BSS 7925-2 - Standard for Software Component Testing

Review the document

The MTP needs to be reviewed, with reviews taking place face-to-face. If it is contentious, points of conflict need to be talked through. The MTP is not solely "owned" by the testing team(s); developments groups and users can contribute significantly to its clarification and suggest other items to be added.

What is and what is not to be tested, are two key elements in the MTP. In October 2002, I worked on a project where testing was, as always, pushed for time. The MTP specified that significant testing would concentrate on the retail system with respect to '53-week year' processing (2002 - 2003 was a 53-week year). The development team failed to realise the significance of 53-week years, but the mere insertion of the testing intention resulted in better code (development extended unit test coverage, found some problems and implemented fixes).

It is usual for the detail listed in the MTP to be used as a basis for deciding whether the software under test is suitable for the next stage of testing, deployment to production, etc. Thus, key individuals need to see and agree this detail before the crunch implementation meeting!

Facing Reality

The MTP is one place where testing comes face-to-face with reality.

The MTP is not free-standing, but fits into the overall Test Strategy. In some ways, it is not a prescriptive approach, but a checklist to remind those responsible what should be considered for inclusion in the MTP. Its only pre-

scriptive feature is to use of the 16 point "check-list". It is perfectly OK to exclude one of the 16 points, so long as the reasons for excluding it are listed and agreed by the MTP's reviewers. The MTP also includes risks and assumptions; sometimes the explicit statement of a risk or assumption promotes lively discussion, and even resolution!

Conclusion

As a standard, IEEE 829 is not so much about how to test, but how to document that you have tested, and there is interplay between it and other of the project's standards and documents.

Adherence to IEEE 829 is no guarantee that the testing project will be successful. It should not be used blindly as a standard, but appropriately. Testing is a service that adds nothing to the project team's output; a tester does not make better software (and testers should not be allowed to alter code). We therefore need to slay the myth of "documentation for documentation's sake" and ask ourselves "does the output enable the test and/or development teams to do a better job; or help them to present the information found during testing in a clearer way; or demonstrate to an outside agency (e.g. the auditors) that testing has been properly planned and completed?

Merely incorporating IEEE 829 will not make a success of a project. It can, however, help to make a success by providing guidelines and pointing the way to better understanding and to better documentation.

Where to learn more

Template - Test Plan Template, based on IEEE 829: Systeme Evolutif web-site: <http://www.evolutif.co.uk/tkb/guidelines/ieee829/>)

also...

http://www.cs.swt.edu/~donshafer/project_documents/test_plan_template.html

Sample - SAMPLE Test Plan, again based on IEEE 829: Systeme Evolutif web-site: <http://www.evolutif.co.uk/tkb/guidelines/ieee829/> and then select Sample MTP

Worked example -

http://www.luckydogarts.com/dm158/docs/System_Test_Plan.doc

See also -

<http://www.google.com> and search for "IEEE 829"

All the web sites above were returned from a 'Google' search. The author has no commercial or other interest in these particular sites.

About the author

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