

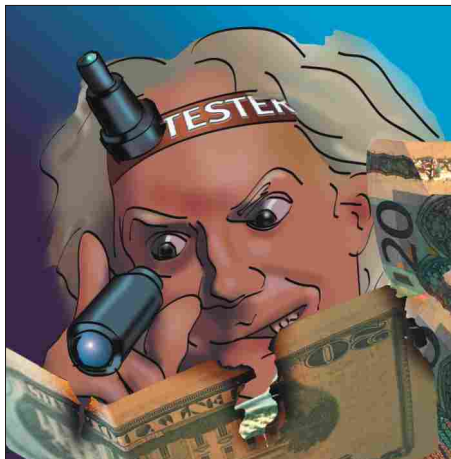
Value-based Testing

Or the price of error

What happens to faults once they are reported? In some organisations they are smoothly resolved without any further input from the tester. In others there is a continual ducking and diving as project managers evade anything that could impact their delivery date or use any more of their over-stretched budget.



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Developers challenge the interpretation of the requirements, the repeatability of the tests or the feasibility of implementing the proposed fix. The tester has to stand his ground and argue his case, while the fault report goes round and round in circles filtering to the bottom of somebody's priority list. Trying to find the best process led me to define a method I will call "Value-based Testing".

The Method

When you classify the fault, simply ask the question: "What is the potential cost of failure if this fault is not fixed?" Fortunately IEEE 1044 offers various Impact Classification schemes including Customer Value (IM300), so any IEEE 1044 compliant anomaly reporting tool should be helpful. The IM300 classifications are as follows:

Code	Classification
IM310	Priceless
IM320	High
IM330	Medium
IM340	Low
IM350	None
IM360	Detrimental

The standard allows each organisation or project to embellish these classes with their own interpretations, and in fact IEEE 1044.1 offers such an example. The interpretations I prefer to use go something like figure 1. The first thing to notice from this table is that the Test Analyst needs a good line of communication to all responsible Managers including the MD. It should also include a 'whistle blower' line, in the event that none of the responsible Managers is prepared to prevent failures of the most serious or priceless category. The second thing to note is that the tester may consider some faults too serious for even the Project Manager or the CEO to allow. These levels of responsibility cannot be delegated.

Now, having established this precedent, the rest falls into place quite naturally. The various people with whom the 'buck stops' are empowered to decide whether or not they want the fault at their own level of interest to be fixed, and also whether or not to protect those further up the hierarchy from having to address any issues. Conversely, none of the responsible people need to worry about details 'beneath their concern'.

Introducing the Method

The best place to start is with the Test Plan. Fortunately IEEE 829 identifies a place in Test Plans called 'Test deliverables' where the 'Test incident reports' must be

identified. This section can be expanded or cross-referenced to describe how the test incidents should be processed, and can include something along the lines described above. Most important is to establish the actual responsible persons and class descriptions, which will vary from organisation to organisation depending on the actual industry and position within the industry. The Test Plan is signed-off by the delegated authorities within the organisation. When reporting to people outside the immediate IT department, remember that they may not have the same appreciation of process. Faults may materialise, change classification, and be fixed for a while, only to re-appear later. This pattern may seem normal to us but could be somewhat incomprehensible to those outside. One therefore has to match process reporting to the expectations of those outside IT and the important thing is to establish the lines of communication.

Having established a good fault handling process, one may wish to incorporate the method into the test design, by prioritising tests according to their potential for revealing the worst possible faults in terms of Value to the Customer.

Converting Value-based Testing to Risk-based Testing

Value-based Testing is really the first step to Risk-based Testing. To get Risk-based Testing, you need to multiply the cost of each fault with the probability of it occurring, be that when the test is planned or after the fault has been found.

Advantages of Value-based Testing

Value-based Testing avoids any reference to probability. I have little confidence in 'probability' when applied to Application Software. When a test is being planned, the probability is wide open. On new systems, it is often just a guess; on legacy systems statistics may be gathered from

Classification	Description	Buck stops with...
Priceless	Tort. Damages can be suffered for which no monetary value can be readily established. These could include loss of life or limb, breach of national security, loss of trading licence, etc.	Trial Judge
High	Consequential Damages. Damages are suffered for which a monetary value can readily be established. Some other part of the business is put to great inconvenience and at great cost, but the business as a whole can survive. The company is still solvent.	MD / CEO
Medium	Liquidated Damages. The supplier or developer has failed to fulfill their contractual obligations (requirements have not been fulfilled). The customer is understandably aggrieved, but there is room for negotiation. The project has not yet become bankrupt.	Project Manager
Low	Loss of Goodwill. The supplier or developer has fulfilled the letter of the contract but in such a way as to leave the customer with a bitter taste. There is a real danger that he won't come back for the next piece of work that needs doing.	Account Manager
None	Loss of Maintainability. The current project is satisfactory and the customer is happy, but there are internal problems that will make it difficult to repair or enhance the system in the future.	Development Manager
Detrimental	Loss of Profit. Time and effort have been wasted in including some feature or facility that is not required. The opportunity to sell an enhancement has been lost. Even more time and effort will be lost if one decides to take it out.	Marketing Manager

fig.1

the past, but there is little fundamental reason why it should apply to the future. Once a fault has been found, I prefer to think that 'Sod's law' or 'Murphy's law' comes into play; and that if anything can go wrong it will go wrong. To say that a fault will not lead to a failure because of a low probability of occurrence is like sweeping the fault under the carpet.

Finally, monitoring the faults found and fixed, classified according to Customer Value, immediately gives a very vivid measure of the value of the Testing resources to the business, and that cannot be a bad thing ■

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