

# Automatic for the people

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*The quality of test tools has certainly matured during the past number of years. Their scope, diversity and level of application have increased. But how far are we, what tools are used most and what is the level of satisfaction? This paper presents the results of a well-founded test tool survey that was carried out in over 400 organisations world-wide ranging from IT-companies with no more than 200 employees to large multi-nationals. The results can be used by the professional tester to benchmark his current situation, and to identify areas where tools could be used beneficially. To allow a meaningful interpretation a distinction is made between the market area of information systems and technical applications. This paper should also raise the interest of tool providers since it shows what testers are looking for and what tools still often end up as shelfware.*

At a time when time-to-market is more critical than ever before, and applying the latest development methods and tools has shortened the time it takes to develop new systems, it is clearer than ever that testing is on the critical path of software development and that having an effective test process is necessary to ensure that deadlines are met. In this situation tools are needed to provide the necessary support. After all we're living in an IT-society and we're testing software. Subsequently, it is just beyond imagination that testers still do everything manually. In recent years tools have grown to maturity and can, if implemented correctly, provide support in raising the efficiency, quality and control of the test process.

## Implementation

Test tools may be classified according to the activities they support. The main support currently offered by test tools is intended for test management and test execution. In table 1 data is shown regarding the implementation of the various tools - the percentage of companies actually using a certain tool type either off-the-shelf or self-made. No less than 72% of the companies that participated in the survey indicated that they had at least one test tool. As stated earlier, the data distinguishes between the areas of technical applications (e.g. industry, embedded software and telecommunications) and information systems (e.g. banking, insurance and government).

<i>Test tool implementation ratio<sup>1</sup></i>	Technical Applications	Information Systems	Overall
Test Management	45%	30%	35%
Defect management	59%	44%	51%
Configuration mgt.	50%	25%	37%
CM on testware	37%	10%	23%
Static analysis	22%	4%	12%
Test design	18%	13%	15%
Coverage tools	17%	2%	9%
Performance tools	35%	15%	25%
Record & playback	29%	30%	29%

*Table 1: Test tools implementation ratio*

Table 1 immediately shows a general tendency in tool uptake; in the area of technical applications substantially more tools are available and applied than in the area of information systems. This is true for almost every type of tool. Looking at table 1 there seems to be a large uptake of test management tools, which also corresponds with my own personal experience where I've recently come across tools like TestDirector and TestManager a lot. The implementation ratio of defect management tools is still unbelievably low compared to the offerings available in the market. There are many defect management tools available, in all price ranges and for varying levels of maturity. To me it is disconcerting that around

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<sup>1</sup> Implementation ratio is defined as the number of organisations using a certain test tool divided by the total number surveyed

50% of the test organisations are still doing defect management without a proper supporting tool and are still carrying the process either manually or by means of an improvised excel sheet. It should be noted that although configuration management is used in approximately 40% of the organisations, a much lower percentage uses it for configuration management of testware.

It seems 1 out of 5 organisations in the area of technical applications has a static analysis tool. The fact that this is much lower for information systems can be explained by the fact that few tools are available for 4GL languages. The same reasoning probably also applies to the test coverage tooling. Although only a few tools exist for test design over 10% of the organisations have a supporting tool available. In my personal experience thorough test design tools are available for use case testing, cause/effect graphing and component testing, whereby the tool generates test cases from the code to achieve a certain level of code coverage. The only area where the uptake of tools is approximately the same is record (capture) & playback. Although often perceived as the most popular test tool, only one out of three organisations seems to have a record & playback tool. This means that most scripted testing is still done manually and a full regression is almost impossible.

### User Satisfaction

Having a tool is one thing, but how satisfied are we regarding our test tools; do we perceive many or even any benefits? In the tool survey we inquired regarding the overall level of satisfaction and more specifically per type of tool. Overall 31% responded that they received many benefits, 67% stated that they received some benefits but expected more and only 2% didn't receive any benefits at all. This seems to be a reasonable score, and compared to earlier surveys an increase in perceived satisfaction level can be observed. Participants were also asked to rate their satisfaction level for individual tools on a scale of 1 to 10. Looking the individual tools (table 2 shows an overview by tools per phase) one can see the results corresponding to "some benefits but expected more score".

<i>Test tool satisfaction level</i>	Control	Quality	Efficiency
Test management and control	5.8	5.1	5.4
Test preparation	5.4	5.7	5.5
Test execution	5.9	6.5	6.6

*Table 2: Test tool satisfaction level*

On a scale of 1 to 10 no real high scores can be observed, although the highest level of satisfaction is clearly in the area of test execution tools with benefits in the area of better and more effective testing (quality) and more efficient testing (less effort). As to be expected tools in the area of test management and control have the highest satisfaction score in the area of control. As a whole this is only an average score for satisfaction and a challenge for the upcoming years.

### People's favourites

Perhaps one of most interesting questions of the survey for the testing practitioner is, which tools do people indicate as their favourites. This of course could be seen as a top five recommendation list by other testers. Use the practical experiences from your colleagues, rather than taking advice from a tool vendor. The list of people's favourite tools is corrected for the number of implementation occurrences and also shows the area and level of benefit that testers can receive, ranging from "+" (some benefits) to "+++" (great many benefits).

	Control	Quality	Efficiency
1. Record & Playback	+	+	++
2. Defect management	++	+	+
3. Coverage	++	++	+
4. Configuration mgt.	+++	+	
5. Static analysis	++	+++	

*Table 3: People's favourites*

Record & playback is still the tool with the highest potential. Table 3 shows that although record & playback is often mentioned as a tool that improves testing efficiency, it is also indicated that these tools

provide more control to the test processes and allow for more effective testing. It surprised me that three tools that relate more to developers (coverage, configuration management and static analysis) are on the list. One may also notice that a lot of benefits are in the area of control and quality and that test tools are certainly not only for improving the efficiency.

### Shelfware

There are organisations that have successfully chosen and purchased a test tool but many organisations have not achieved any benefit from their investment because their tools have ended up not being used, i.e. on the shelf or “shelfware”. This is not only a problem for test tools, but also a common problem for many types of tools. During the survey the respondents were asked whether they had any shelfware, and if so what tools had become shelfware. No less than 26% of the organisations claimed to have some sort of shelfware. Although this is still a high number, the percentage is substantially lower than reported in earlier surveys by Dorothy Graham; 50% in 1995, 45% in 1997 and 40% in 1998 (Fewster and Graham, 1999). Figure 1 shows the type of tools that end up as shelfware. Record & playback (42%) is by far the winner. In general one can say the test tools that require a substantial implementation process are mentioned here. It seems not every organisation is yet aware of the fact implementation is a lot more than buying a tool. A thorough selection and implementation process is a critical success factor for beneficial tool support (Veenendaal, 2002). It is interesting to see that record & playback is both

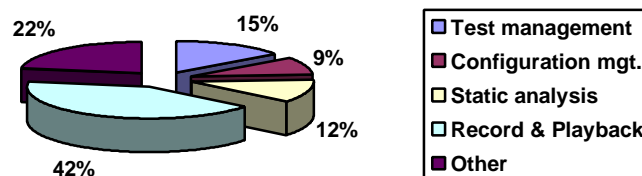


Figure 1: Overview shelfware tools

number one on the “peoples favourite” list and number one on the shelfware list. Apparently it is either implemented correctly and thoroughly and as a result has great benefits or it does not receive the required amount of resources and as a result becomes shelfware.

### More tools?

Finally it was asked whether people would like more tools. This of course is especially an interesting question for tool suppliers, since it indicates what people are looking for. No less than 75% stated that they would like more tools. The three tools that were mentioned most are record & playback, test management and code coverage. For record & playback and code coverage there seems to be a logical explanation. They both still today have limitations regarding hardware and software platforms and programming language. Many organisations in the area of information systems are looking for coverage tools that support 4GL languages and not for tools that support “just” C, C++ and Java. In the area of technical applications the usage of a standard (non-intrusive) record & playback tool is still limited due to various hardware and software constraints. Perhaps an interesting challenge for the tool suppliers!

### References

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