P R E S E N T A T I O N

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A Complete Guide to Evaluating Test Tools

John Watkins

A Complete Guide to Evaluating Testing Tools

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Overview

- Do You Really Need a Tool ?
- Conducting Market Research
- Making a Short List
- Organising Supplier Presentations
- Performing a Formal Evaluation
- Acquiring and Rolling-Out the Tool
- Monitoring & Managing Your Success

- Conclusions and Summary

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Do You Really Need a Tool ?

- ◆ Tools Cost Money !
- ◆ Will You Use the Tool Once or Many Times ?
- ◆ Could You Spend the Money More Effectively ?
  - ▪ improve your development and testing process
  - ▪ Invest in some training
  - ▪ outsource the testing tasks
- ◆ Do you need a Point Solution ?
- ◆ Don't Grab a Tool When You have Problems !

- ◆ Make sure you record your requirements !

Record Your Requirements

- Document your requirements – they will be used later

- Record some high-level Key Criteria

- For example, Do You Need – Functional, Reliability, and / or Performance Testing ?

- Do You Need to perform Regression Testing ?

- Think about Integration with other tools ?

- What are the characteristics of your software ?

- Remember – the requirements will Change !

When is a Tool Appropriate?

- ◆ Where there are frequent Builds and Releases

- ◆ Where the application structure is complex involving GUI or client/server

- ◆ Where there is a requirement for thorough / rigorous / repeatable testing (e.g Regression Testing)

- ◆ Where users demand that requirements change

- ◆ Where there is a need to reduce timescales and effort

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Do Some Market Research ...

- Read the trade magazines
- Attend Special Interest Group Meetings
- Attend Exhibitions
- Attend Conferences
- Look for Review Papers
- Consider Analyst Publications (carefully)
- Talk to Colleagues
- Surf the Web

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Make a Shortlist

- Use your Key Criteria
- Don't be too selective too early
- Aim to identify at least 5 candidates
- For each one, record some standard information:
  - Name of Tool
  - Name & Address of Supplier
  - Telephone & Fax
  - Email & Web site addresses
  - Leave space for contact details (e.g. Account Manager name)
- Review the list and identify 2 to 3 good candidates
- Obtain further information on tool and supplier

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Organise Supplier Presentations

- Make contact with the Supplier and outline your requirements (perhaps let them have requirement list)

- Let them know you have done some research and they have been short listed

- Discuss the presentation/demonstration with the supplier, based on your needs and your requirements

- If you have a short list of 2, consider getting both suppliers in on the same day – AM and PM

- Prepare for the presentation – tell them what you want to see, review your requirements, prepare questions

Managing the Supplier Presentation

- Produce an Agenda describing what you expect
- Consider arranging for a demonstration against your own system and software
- Book a suitable room and confirm presentation requirements with Supplier
- Prepare some questions you would like answered – and don't be afraid to press the Supplier
- Take lots of notes during the presentation (and consider writing the minutes of the meeting summarising actions)

- Remember you are in charge, but be a good host too !

Post Presentation Activities

- Review the results of the presentations

- Review how well the tools met your Key Criteria

- Consider drafting further questions for the suppliers

- Review the supplier responses

- On the basis of the above, shortlist 1 or 2 tools for formal evaluation

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Evaluating the Tool

- Contact the supplier to arrange for the evaluation
- Discuss support for the evaluation:
  - Assistance with installation of the tool
  - Brief hand-holding / mentoring
  - Contact and support information
  - Ask for an evaluation guide document
- Plan and run the evaluation as a formal project
- Ensure adequate resources
- Use formal evaluation criteria and a scoring scheme
- Record and document results of evaluation

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Run the Evaluation as a Project

◆ Plan the evaluation

Timescales Tasks	Days					
	5	10	15	20	25	30
Start-Up Meeting	■					
Install Testing Tool	■					
Familiarisation	■■■ ■ ■ ■					
Evaluate Testing Tool		■ ■ ■■■■■■■		■ ■ ■		
Midpoint Review Meeting			■			
Write Evaluation Report					■ ■ ■■■■	
Close-Down Meeting						■
Milestones	1		2		3	4

Milestones
1. Install Testing Tool Task Complete
2. Midpoint Review Meeting Complete
3. Evaluation Task Complete
4. Write Evaluation Report Task Complete

Acquire the Tool

- If the tool fits your requirements – begin the process of acquiring the product
- Contact your Account Manager to finalise details
- Investigate payment schemes
- Consider Fixed v. Floating Licenses (if appropriate)
- Investigate discount schemes (maybe based on seats)
- But,

Don't let Testosterone stop you getting what you need!

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Roll-Out the Tool

- Need to Ensure Management Buy-In

- Review Current Testing Practice

- Integrate Automation Properly

- Consider a Pilot Testing Project

- Ensure Adequate Training is Planned

- Identify a Testing Champion

- Collect Metrics and Measure Progress

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Monitor and Manage Your Success

- Make sure success is advertised

- Consider the role of Metrics Collection

- Work on ensuring the tool is adopted and used

Metrics - Issues to Consider

- Make sure you know what your goals are

- Do not Forget that Collecting Metrics means Effort

- Make Sure Everyone is Committed to Metrics

- Make Sure Reported Information is Accurate

- Be aware that the process of collecting Metrics may affect the values of the Metrics you Collect (the Hawthorn Effect)!

  (Take a look in "Software Test Automation", Fewster & Graham, Addison Wesley, 1999 for good advice on metrics)

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Strategies for Improving Adoption

- Set up an Automated Testing Forum/Interest Group

- Ensure Results are Published and Distributed

- Identify Objectors and Turn Them Around

- Consider an Automation Librarian/Advocate who can act as a point of reference for Automated Testing Queries/Successes

- Use your Intranet to publish success

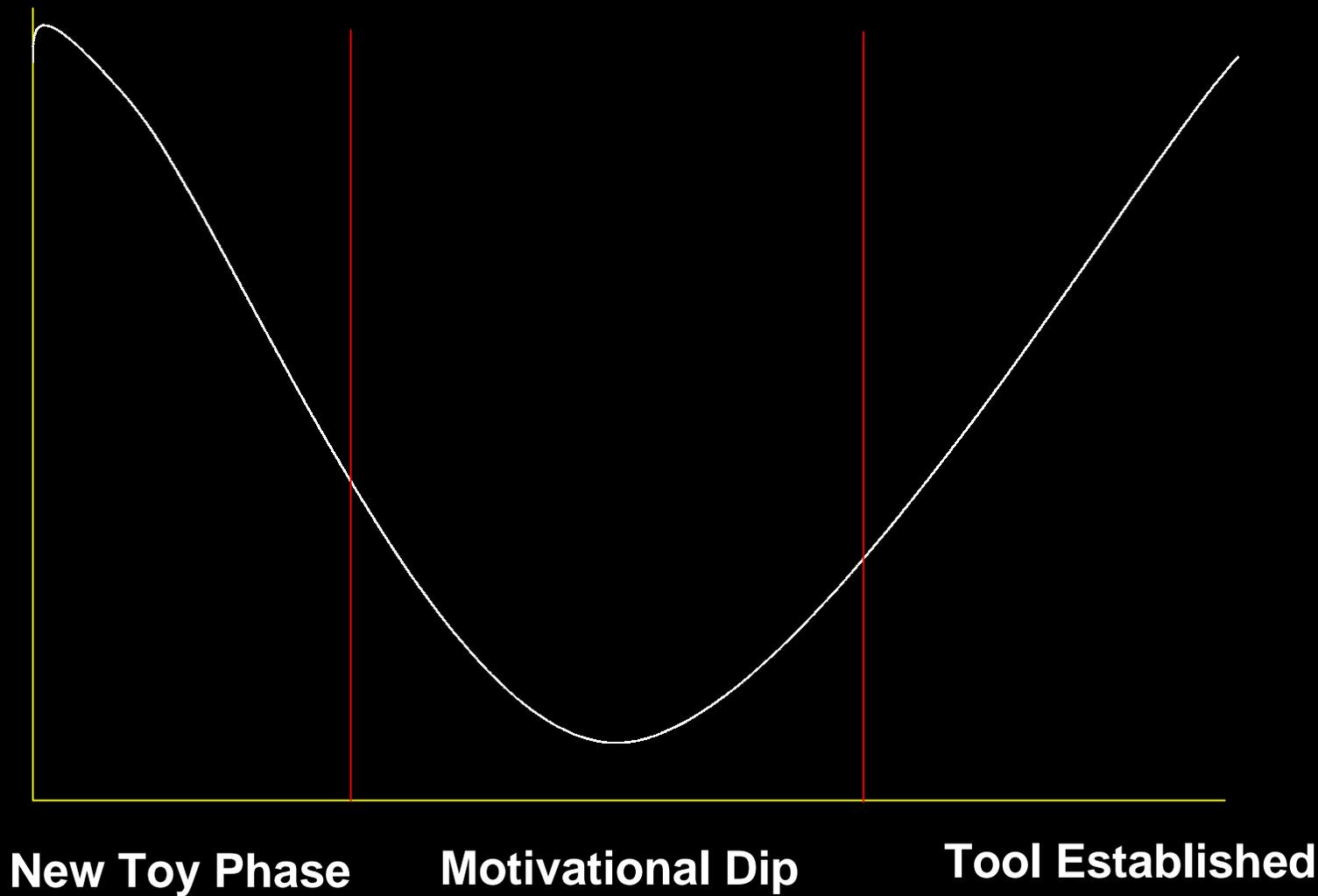- Make maximum use of your Champion

- Have Stamina and Persevere!

Beware ...

- You will not get instant benefits
- Initial enthusiasm may wane quickly
- Make sure there is Process support for the tool
- Plan and budget for Training, Mentoring & Consultancy
- Be wary of one-horse operations
- Consider Integration Issues Carefully
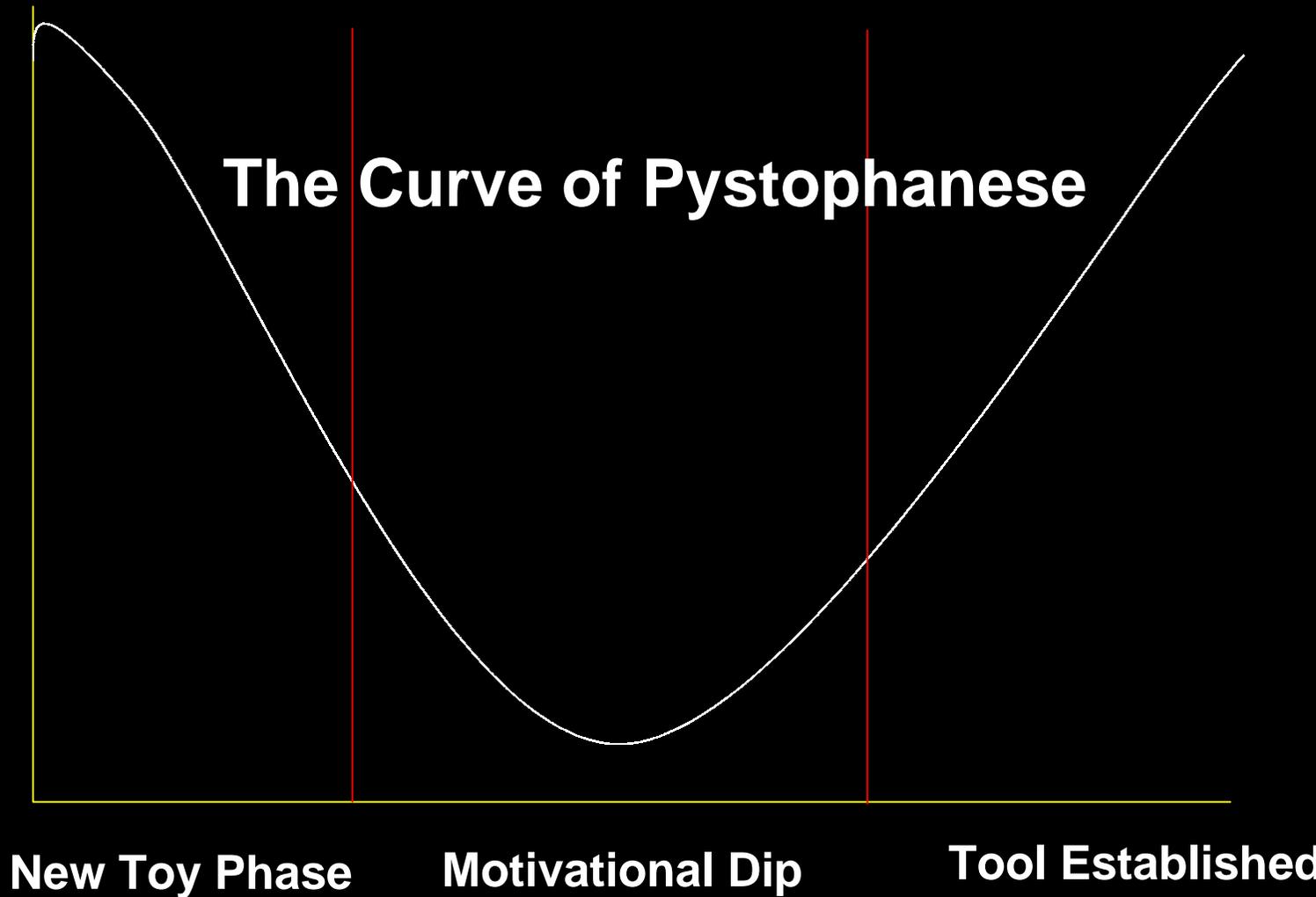
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Summary

- Make sure you can benefit from tools adoption

- Review the market and make a list of candidates

- Use Key selection Criteria to make a shortlist

- Contact suppliers to arrange presentations

- Formally evaluate the most appropriate tool

- If successful, acquire and roll out the tool

- Do not be complacent about its adoption

- Persevere !

Graph of Enthusiasm v. Time

New Toy Phase   **Motivational Dip**   **Tool Established**

Graph of Enthusiasm v. Time

The Curve of Pystophanese

New Toy Phase   **Motivational Dip**   **Tool Established**

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A Complete Guide to Evaluating Testing Tools

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How many of you have infinite time, money and resource to test your software? How many of you are relaxing your requirement for software quality while increasing the timescales available for testing? Who believes you can develop defect free software? All those of you who put your hands up can stop reading this article now and can move on to the next one. As for the rest of us …

The fact is that the majority of us are facing the paradox of ever shorter development and testing timescales combined with the need for software of ever increasing quality. Improvements in the management of testing and testing process provide the means of making testing as effective and efficient as possible. Automated software testing tools provide another possible strategy for saving time, effort and cost, and improving quality. However, if your organisation is already short of time, money and resource for testing, how can you be expected to spend more time, effort and money in identifying a suitable candidate testing tool and determining if it is the right one for your organisation? Be reassured – you are not the first to face this dilemma.

This paper describes an approach you can use to simplify the selection of an automated tool that matches your own particular testing requirements. The approach is based on a number of sources including work the author has conducted on behalf of numerous clients as well as a vast body of feedback from organisations engaged in the process of evaluating software testing tools. Briefly, this article will:

- Discuss whether you really need an automated testing tool
- Review why it is necessary to perform a formal evaluation
- Discuss the process of identifying and documenting your testing requirements
- Discuss the need to research the market and generate a short-list of tools
- Describe the need to organise presentations from the short-listed suppliers
- Discuss the role of product evaluation in selecting the right tool
- Discuss the post evaluation activities.

Figure 1 provides a "route map" of the process, showing the activities that need to be performed, the artefacts created during the process, and the stakeholders. The notation used follows that presented in Reference 1. Additionally, details are provided describing how you can obtain a White Paper which provides comprehensive information on evaluating testing tools, an evaluation project plan, evaluation criteria and scoring scheme, plus evaluation check list, evaluation report and business case templates.
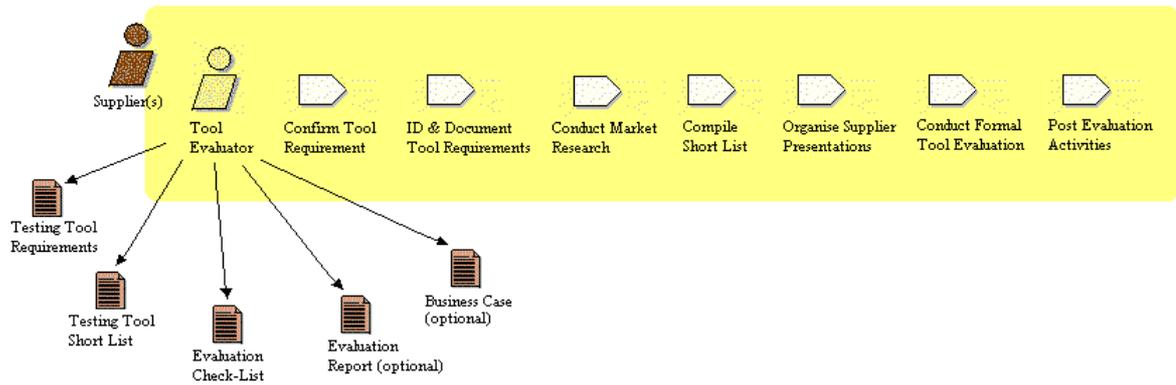
Figure 1 – Evaluation Route-Map

Do you really need an Automated Testing Tool ?

So, you have some issues with your current approach to testing - but do you really need a testing tool? Before rushing out to buy a tool, you should first consider the following:

- Tools cost money – money that might have been spent more effectively. For example, could investing in training help address your testing problems?
- Are you managing your approach to testing efficiently – and could better management techniques be a solution?
- Could adopting an effective development and testing process (such as Reference 1) be of benefit?
- If you have a short term or infrequent requirement for testing, would it be more cost effective to outsource the testing?

Finally, do not rush out and buy a testing tool if your project is in the middle of a software-testing crisis in the hope that it will save the day. This is the very worst time to consider buying a tool – not only will you waste precious time and effort learning how to use the tool, but you are highly unlikely to make any productivity gains on the first or even second use of the tool (although one of the case studies in Reference 2 does claim one organisation benefited after just two uses of a software testing tool). There are genuine benefits to be gained by the use of tools – but only through their planned and managed introduction, and through continued use and re-use of the test suite that you will develop.

So when is it appropriate to use an automated testing tool? Such products are particularly appropriate if you have:

- Frequent builds and releases of the software you are testing
- A requirement for thorough regression testing, and particularly for business critical, safety critical, and secure or confidential software systems
- Software involving complex graphical user interfaces
- A requirement for rigorous, thorough and repeatable testing
- The need to deliver the software across many different platforms
- The need to reduce timescales, effort and cost
- A requirement to perform more testing in shorter timescales.

If you have a requirement for one or more of the above, you should consider investigating what benefits you could gain from automated testing tool use.

Why do you need to perform a formal evaluation ?

The majority of suppliers will tell you that their tool is clearly the best, is incredibly easy to use, and will of course solve all your testing problems. The reality is that you have a unique set of requirements, and you must make sure that any tool you select satisfies those requirements.

Furthermore, many suppliers will insist that you should buy their tool because it is the market-leading product and therefore, must be the best. Be careful not to place over-reliance on such claims – it is much more important that the tool match your specific testing requirements. .EXE Magazine recently commissioned a study that showed that the top five issues for tool purchasers were: reliability of the tool, good match to requirements, adequate performance, ease of use and good documentation. Market leadership was ranked as the least important issue in fifteenth place!

The bottom line is that adopting a tool will mean a significant investment in time, effort and money, and before committing your organisation and its resources, you must assure yourself that the tool you choose will match your testing requirements. Because of this, you should adopt a formal means of identifying the right tool and be able to demonstrate the rigor of the process to your managers and colleagues.

Identify and Document your Testing Tool Requirements

During the process of determining that you need a tool, you will have had to consider your specific testing requirements for such a tool. During this process, make sure that you document these requirements – they will be used later. Examples of such requirements could include: "the tool must support functional testing and regression testing", "process support must be available for the tool", and "the tool must seamlessly integrate with other development tools such as requirements management and defect tracking tools".

As you compile your set of requirements, try to determine just how important each one is and assign a weighting to it to indicate its significance (in practice most organisations have found a simple three category "Essential", "Important" and "Desirable" approach to be effective).

Maintain the requirements information as a live document as you are almost certain to add additional requirements as the evaluation process continues, as well as relaxing or strengthening the weightings of specific requirements (the White Paper provides comprehensive guidance and advice on documenting your requirements as well as a weighted scoring scheme to assist in your evaluation).

Armed with your documented testing tool requirements, you are now ready to do some market research.

Conduct Market Research and Compile a Short-List of Tools

The next task in the evaluation process is to identify those testing tools that most closely match your requirements. This is a two-pass activity:

- First identify a collection of candidate tools which loosely match your high level or "Essential" requirements
- Second, review the candidate tools more rigorously to reject those products that fail to match your "Essential" and "Important" requirements. This activity may involve contacting the supplier, obtaining product brochures and visiting the supplier Web site.

In performing the research to identify the candidate tools, there are many sources of information you can use, including:

- Testing trade magazines (such as The Professional Tester)
- Special interest group meetings (such as the BCS SIGiST group)
- Testing exhibitions, tools fairs and conferences (such as QBIT's Testing Week)
- Analyst publications (such as those produced by Ovum)
- The Web.

The White Paper provides further details on sources of information. The output from this task will be a short-list of tools and the contact details for their suppliers. Ultimately you should aim to identify just two tools, which you will then investigate in greater detail.

Organise Supplier Presentations

Once you have your short-list, it is time to do some further research in order to determine which tool best matches your requirements as a prelude to formally evaluating that tool.

A particularly effective strategy is to organise supplier presentations of the short-listed tools. Contact the supplier and outline your requirement (you might consider providing them with a copy of the requirements – trustworthy suppliers will quickly let you know if there is a good match to their tool or not to save wasting your time and theirs).

Propose that the supplier organises a presentation of their tool based on your particular requirements and consider providing them with a copy or sample of your application so that they can demonstrate their tool using your software rather than some demonstration application. Prepare in advance for the presentation by reviewing your requirements and preparing questions for the supplier. It may be of benefit to produce an agenda describing what you expect to see and provide this to the supplier to review before the meeting.

During the presentation, make sure you take notes documenting the progress of the event, the answers to questions you ask, as well as any further questions raised. Do not be afraid to press the supplier if they appear to skip over some aspect of the tool or fail to answer any of your questions adequately. The reason may be quite innocent or it may reveal some weakness or limitation of the tool. Finally, remember that you are in charge, but be a good host too (you may end up working with these people if you purchase their tool).

If you have short-listed two suppliers, it can be very effective to see them both on the same day (one in the morning and one in the afternoon). If you plan to review the results of the presentations immediately after the events, both will be fresh in your mind. Also, it is likely that each presentation will raise further questions, and this will give you the opportunity to quickly contact the suppliers for any clarifications.

After each presentation, spend some time reviewing the results of the event. Review how well the tools met your requirements, and determine if there are any final questions or clarifications you need the supplier to answer. If you do have further questions, document them and provide them to the supplier. Finally, on the basis of the presentations and any supplier clarifications, select one of the short-listed tools for formal evaluation (although, if your organisation has sufficient time, resource and funds, you may consider conducting a formal evaluation of both tools).

Formally Evaluating the Testing Tool

After selecting the tool that you believe most closely matches your requirements, you will need to perform a formal evaluation of the product to demonstrate that it will be able to satisfy your requirements in practice (that is, in your test environment and with your software). This exercise is often termed a "Proof of Concept".

Contact the supplier and ask for an evaluation copy of the tool. Most suppliers will provide you with a full working copy of the product, which is typically licensed for 30 days. Ask what support is available to you during the evaluation period (for example, if needed will the supplier provide assistance with installation, who should you contact for technical support, and is there any documentation available to help support your evaluation?).

Run the evaluation as a formal project and ensure that adequate commitment is available from senior management in terms of timescales and resources (Figure 2 provides a typical project plan for an evaluation). Within your evaluation plan, include a number of milestones at which you formally contact the supplier to review progress and address any issues raised by the evaluation.

In evaluating the tool, you should use your formal requirements document, taking into account the weightings for each requirement and identifying how well the tool satisfies that requirement.

After evaluating the tool, you should document the results of the project in the form of an Evaluation Report. This report may be as simple as a record of the requirements,

their weightings and the evaluation score held in a checklist or could be as formal as a written report. Consider providing the supplier with a copy of the report so that they can review your results – if you have misunderstood some aspect of the tool and given the associated requirement a poor score, the supplier will be able to advise you of the misconception and explain how the requirements can be satisfied.

In addition to an Evaluation Report, you may also need to produce a Business Case document for senior management containing recommendations on the acquisition of the tool as well as return on investment calculations. The White Paper provides re-usable templates for both the Evaluation Report and Business Case documents should these be required.

On completion of the evaluation, you should review the results of the evaluation and decide on your next actions. If the evaluation was satisfactory, then you will next need to consider acquiring the product.
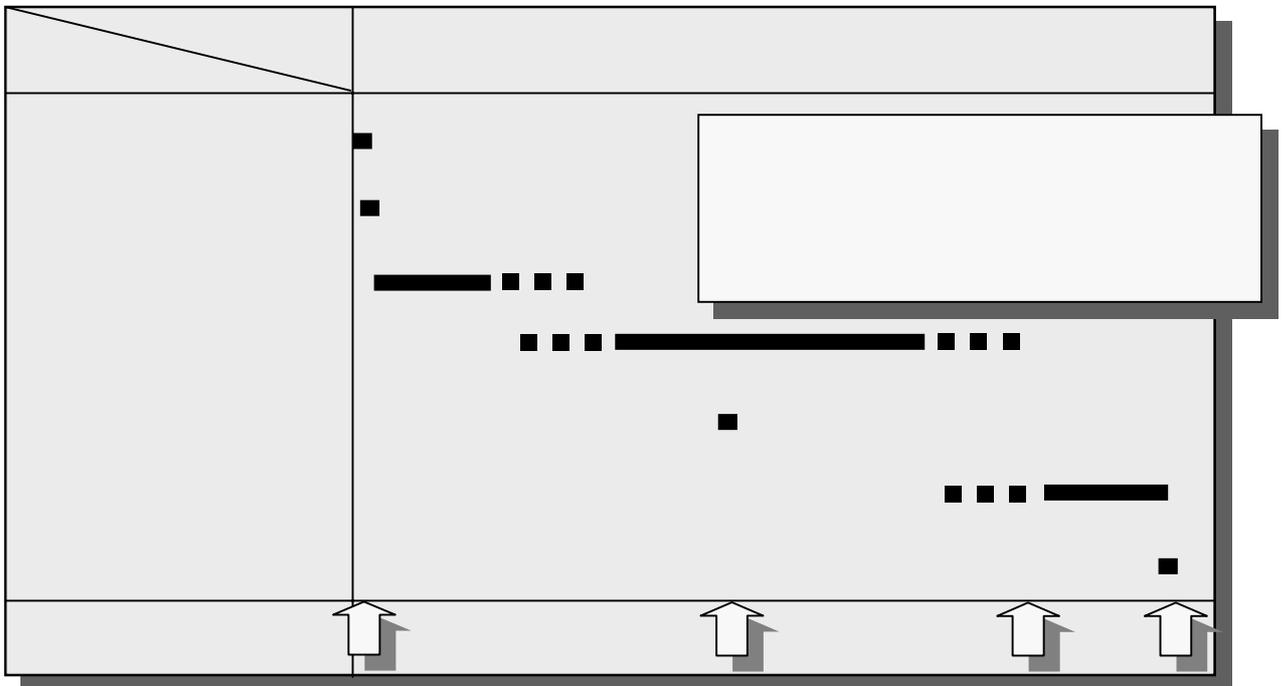
Figure 2 – Evaluation Project Plan

Post Evaluation Activities

In purchasing the tool there are a number of issues to consider.

The first thing to determine is the number of licenses that you will need to buy to allow your organisation to make best use of the tool. You will also need to consider the issue of fixed licenses (typically tied to a particular workstation) or floating licenses (typically installed on a server and issued on a first come first served basis across a network). Floating licenses will give you more flexibility in making the tool available but will almost certainly cost more than the equivalent fixed license. In determining the number of licenses, you should also consider break points for discounts. Typically, suppliers provide discounts based on volume sales of licenses.

Ask your supplier what these break points are so that you can take advantage of them if possible.

While in general terms, it makes good business sense to enquire about discounts, be careful not to let testosterone get in the way of obtaining a product which will be of benefit to your organisation. As incredible as it may seem, there have been many occasions where staff involved in the purchase of tools have walked away from a purchase just because the supplier is unable to reduce the purchase price by, in some cases, tens of pounds!

On the other hand, you should also be very wary of suppliers who will suddenly slash the price of their product as soon as they hear that one of their competitors is involved. You will have to work with the supplier following your purchase (perhaps for training and mentoring, as well as ongoing support), so it is worth considering the business ethics of any supplier who was perfectly happy to charge you £X one day and then suddenly charge you half that amount just a few days later for exactly the same product (while presumably still making a profit). This is not a good basis for a successful continuing business relationship, and suppliers who indulge in such activities are almost certain to find ways of recouping the discount at a later stage, otherwise their business would be unsustainable.

The organisations that gain most benefits from tool use, plan and manage the introduction of the product into their organisation. For example, you should consider the need for training ahead of installation of the tool. Plan for some initial mentoring to ensure correct and affective use of the tool. Consider the benefits of planned consultancy visits at later points during the testing project as "health checks" to ensure continued effective and efficient use of the tool. Reference 3 provides an excellent case study of one such organisation that followed exactly this route and who claim to have made initial savings of some 35% on time and effort in testing as a result.

Finally, persevere. You will not realise benefits from the tool unless you continue to use it to support your testing activities. The more often you re-use the test scripts you have created, the more savings you will make in terms of time, effort and cost.

References

1   "The Rational Unified Process", Krushten, P., Addison Wesley, 1998.
2   "Automating Software Testing", Graham, D. and Fewster, M., Addison Wesley, 1999.
3   "Crown Management Systems Limited Case Study", Crown Management Systems and Rational Software, 1999.

Additionally, a comprehensive White Paper is available from the author (jwatkins@rational.com) which provides a plan, evaluation criteria and scoring scheme, plus evaluation check list, evaluation report summary and business case templates.

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A Complete Guide to Evaluating Test Tools

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John holds Masters Degrees in both Computer Science and Cognitive Psychology, has over 20 years experience in the field of software development, with some 15 years in the field of software testing, and has recently been elected a Fellow of the British Computer Society, largely on the basis of his work in software testing.

During his career, John has accumulated experience as a testing professional at all levels and phases of testing, and has provided high level testing consultancy, training and mentoring to numerous Blue Chip Companies. John currently works for Rational Software Limited where he is the company Testing Product Manager for the UK and Northern Europe region.

John is an international speaker on the subjects of Object-Orientation and Software Testing, and is an accomplished author having published numerous articles in conference proceedings, learned journals and technical papers on the topics of Relational Databases, Object-oriented Programming, Logic Programming, Expert Systems and Testing, as well as having been a contributor to texts on Bio-Technology, Logic Programming and object-orientation. John has recently been awarded a contract by Cambridge University Press for his book on Software Testing Process ("Testing IT : an Off-the-shelf Software Testing Process") scheduled for publication later this year.

Most recently, John was invited to deliver the Keynote speech at the Ohjelmistotestaus 2000 Testing Conference in Helsinki.