

Open Source Testing Tools: The Paradigm Shift

Executive Summary

Businesses today demand faster time-to-market for their software products without significant expenditures in testing tools, and at the same time they want to ensure that software bugs don't eat up their investments. They need cost-effective testing solutions that do not compromise quality to achieve accelerated time-to-value.

In less than a decade, the software testing market has evolved from a small segment of the application development lifecycle to a market unto itself. Plenty of industry-standard testing tools are now available to address different facets of the QA process, ranging from simple unit testing to end-to-end life-cycle management.

Market growth has led to rising end-to-end costs for testing tools. This is motivating IT organizations to seek open source testing tools, which are often less expensive from a total cost of ownership perspective and offer equivalent functionality. Open source tools are now an integral part of the IT spectrum, and have penetrated nearly every aspect of the software testing domain. This paper explores the trends influencing the adoption of open source tools in the software testing arena. It highlights approaches that can help an organization reduce spending on testing tools.

Testing Tools: Commercial vs. Open Source

Traditionally, QA teams prefer using commercial products over open source software. Their rationale includes the following factors.

- Ease of use:
 - Easily usable with little training.
 - Most have clear documentation and tutorials.
- Availability of dedicated support teams:
 - Support user-base through multiple channels for queries, patches and enhancements.
- ROI:
 - Teams spread cost of tools over the life of its usage.
 - Tool requires long-term commitment, thereby reducing probability of migrating to another tool.
- Easier to recruit testing staff:
 - More popular commercial tools would have larger number of people within the knowledge base.

Open Source Advantage

- Lower total cost of ownership.
- Business strategy:
 - Reduced dependencies on specific products/toolsets.
 - Promote faster time-to-market.
- IT strategy:
 - Flexibility.
 - Ease of procurement (off-the-shelf product).
 - Ease of usage.
 - Tool customization.
- Open source community:
 - Strategy and affinity to contribute to the community, thereby promoting open and extensible architectural design of software.

- Open source had risen to the top of the executive agenda: “faster, cheaper, better.”
- Open source is strategically used to gain competitive advantage.
- Open source provides increased innovation opportunities for IT professionals.

The Paradigm Shift

The following developments have raised the ante for open source tools:

- Recent recession has tightened the organizational budget, making open source tools more attractive.
- Low ownership cost, flexibility, increased innovation, shorter development and faster procurement as reasons for picking open source.

Trends Watch: Open Source in Agile

Traditionally, the testing lifecycle has been viewed as a “V” model or a “modified waterfall.” However, many organizations have achieved significant success by leveraging open source tools using the Agile development methodology as well. The reason has to do with the role these tools play in enabling early code-driven tests and continuous integration mechanisms, which are key to the success of Agile projects.

The Way Forward

QA organizations keen to gain value from open source tools have common questions regarding the best approach for adopting open source testing tools. Figure 2 describes the approach towards open source tools adoption.

The migration from commercial to open source tools should be approached as a phased activity.

Open Source Tools Across Testing Lifecycle

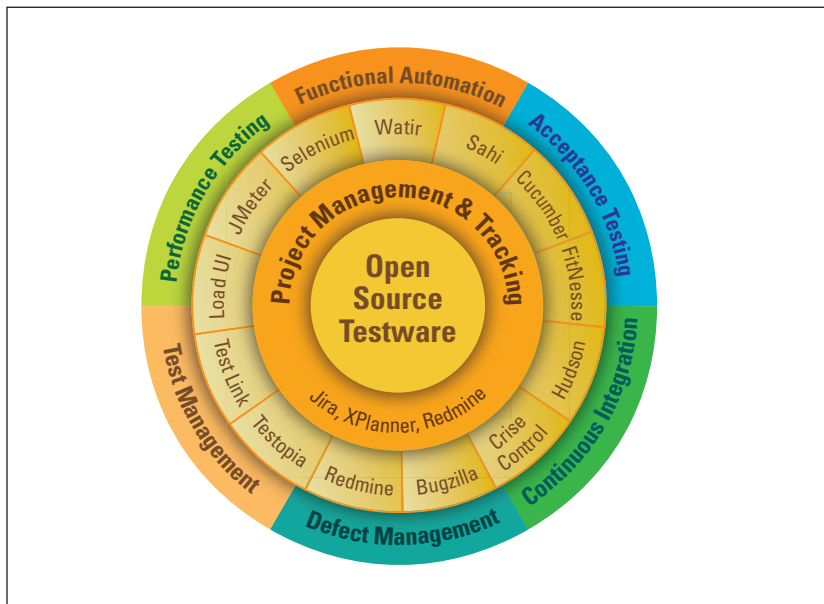


Figure 1

Case Study>>

Open Source Software Yields Accelerated Testing for Entertainment Guide Site

Client Details	Engagement Description	End-result
<p>This client operates leading interactive news and information websites in major markets across the U.S., including 18 of the top 30 markets. The Web sites attract more than 9 million unique visitors per month, and rank among the top 20 interactive news/information networks in the country.</p> <p>This client is a leader in distributed contact centers, enabling businesses to deliver a high-performance call center and high quality customer contact in the most cost-effective manner possible.</p> <p>The company provides best-in-class on-demand call center technology, as well as virtual call center services through a network of over 20,000 independent home agents to hundreds of companies in both direct response and enterprise markets.</p>	<p>The client has a local entertainment guide where one can find details ranging from what-to-do and how-to-go, to discovering the “happening” restaurants and bars in town and the latest music, movies and entertainment information within most cities in the U.S. We provided an automation solution for the local entertainment guide application:</p> <ul style="list-style-type: none"> • New set of automation scripts/functions created to completely automate existing Manual Test Cases using Selenium RC 0.9 with Ruby script. • Star Quality Framework implemented to suit application under test. • Scripts executed on IE 6,7 and FF 3.5 • We performed an analysis on open source test management tools for this project, as per the client’s request. The tools taken in for analysis included: <ul style="list-style-type: none"> > Testopia. > TestLink. <p>We analyzed details for the requested tools and recommended TestLink for test management, as it enabled:</p> <ul style="list-style-type: none"> • Tree structured test projects, plans, suites and cases. • MySQL back-end. • XML RPC API provides easy integration points with external systems. • Easy export of test cases to migrate to another system, if needed. 	<ul style="list-style-type: none"> • 72% cumulative time savings through automation testing vis-à-vis manual testing. • 80% testing coverage achieved through automation. • 60% reusability of automation scripts drastically reduced timelines. • Over 40% savings on time executed as a result of automation scripts executed on multiple browsers. • Dynamic collection and organization of test cases. • Easy tracking of results and metrics associated with test execution. • Capturing and reporting details by conducting a more thorough testing process. • Customized TestLink to fit project requirements and processes.

Approaches to Adopt Open Source Testing Tools

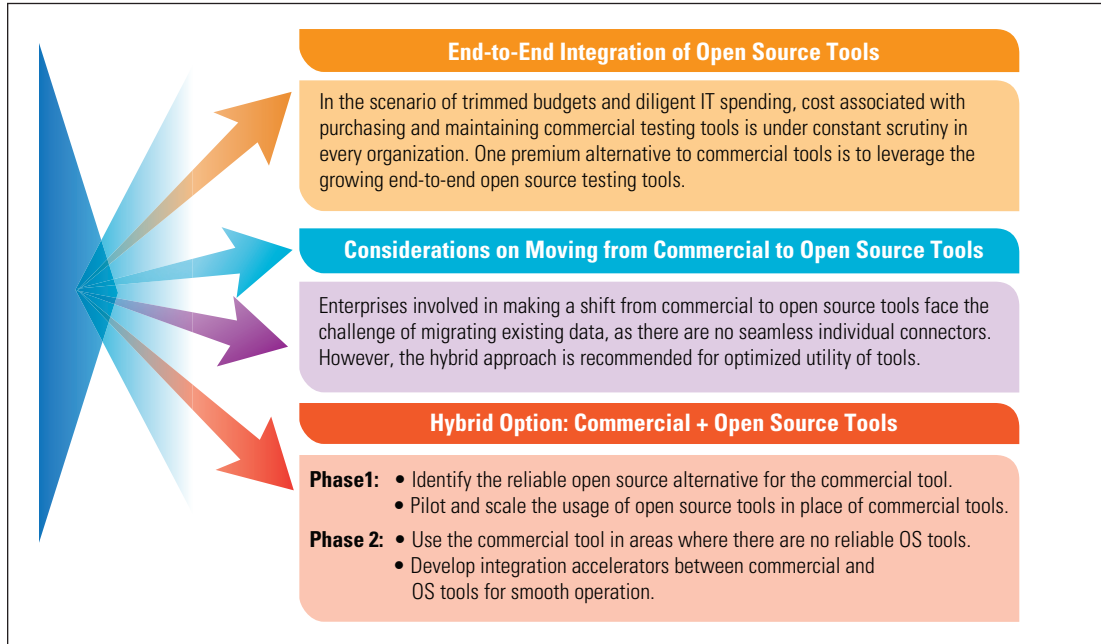


Figure 2

Phase 1: Analysis

Alternative open sources tools must be identified as substitutes for commercial off-the-shelf tools. In doing so, certain analyses – such as proof of concepts, feasibility studies, etc. – must be performed for technical compliance. For example, replacing commercial automation tools with a functional tool such as Selenium or changing the defect management tool to Bugzilla will reduce the number of test management tool licenses.

Phase 2: Pilot

Once the open source tools are identified, the next step is to pilot and scale the usage of these tools in the place of commercial tools. While doing so, it is important to understand and test the migration of data from the existing test.

Phase 3: Recommend and Implement

The identified open source tools are now ready to be implemented. A thorough recommendation that involves the process to migrate, the tools to adopt and also the timelines for a complete migration will be provided in this stage. The recommendation should involve ROI calculations, capturing risks involved in migration to open source, along with the necessity for training QA staff.

End-to-end deployment of open source tools will involve analyzing different tools across phases that will integrate with each other. With the right mix of tool sets, IT organization can leverage end-to-end testing functionalities.

Challenges/Considerations

QA organizations need to consider the following key aspects of the open source testing tool deployment, configuration and usage process:

- Most tools are built to serve a specific purpose; however, availability of source code means organizations can customize the tools as required, with some effort.
- Bugs encountered can cause major issues when a project is under way; when ample support is provided by vendors for respective commercial tools, tool support is limited to general forums and the tools community.
- Administration and maintenance costs increase with increase in project complexity and size; most organizations tend to neglect this component while budgeting and end up with major deviations.
- Tools have non-intuitive user interfaces, which makes it difficult to provide dedicated training. However, training material is usually available in forums, communities and blogs.

Serving Commercial Operations

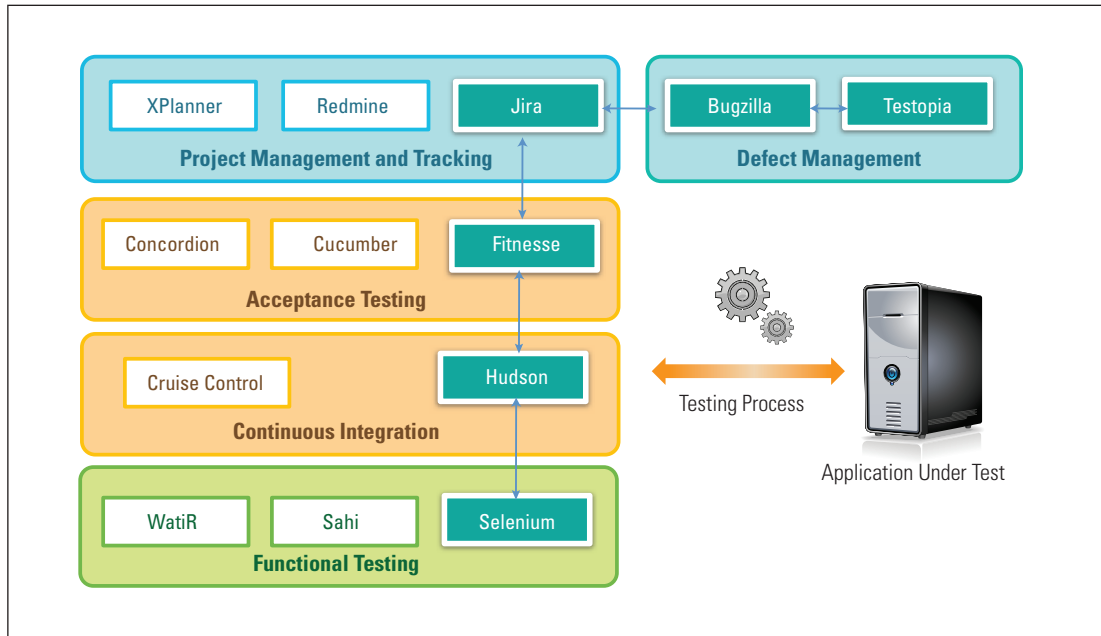


Figure 3

- Different modes of open source licensing mechanisms like GPL, LGPL, etc. need to be understood and appropriately used.

It can be difficult to directly integrate open source software with other tools; this is one of the limitations of open source. Limited reporting options and limited derivation of metrics are other problems for QA groups and IT management.

Recommendations and Conclusion

- Open source tools can drive significant quality and predictability in the testing life cycle, thereby reducing overall application development costs by keeping tool investments lower.

- They help fill in the gaps in the life cycle, particularly if IT has process maturity relative to its overall approach to application life-cycle management solutions.

- Open source tools play a significant role in product development, especially in Agile development processes where time-to-market is paramount.

- Many QA organizations look forward to blending their processes with open source and commercial testing tools. A strong mixture of both would be the best to ensure cost optimization and testing reliability.

About the Authors

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