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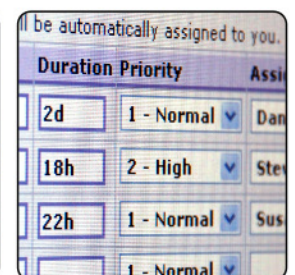
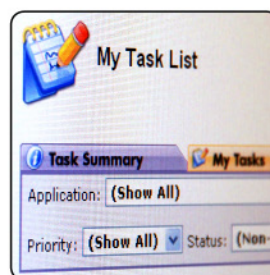
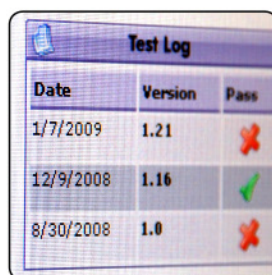
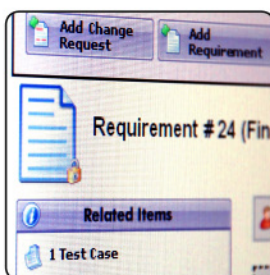
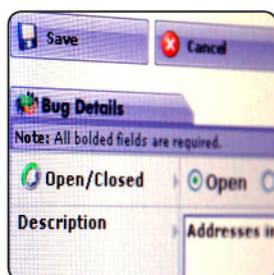
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*by Johanna Rothman*

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Marketing Coordinator

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Circulation Coordinator

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#### CONTACT US

Editors: [editors@bettersoftware.com](mailto:editors@bettersoftware.com)

Subscriber Services: [info@bettersoftware.com](mailto:info@bettersoftware.com)

Phone: 904.278.0524, 888.268.8770

Fax: 904.278.4380

Address:

*Better Software* magazine

Software Quality Engineering, Inc.

330 Corporate Way, Suite 300

Orange Park, FL 32073

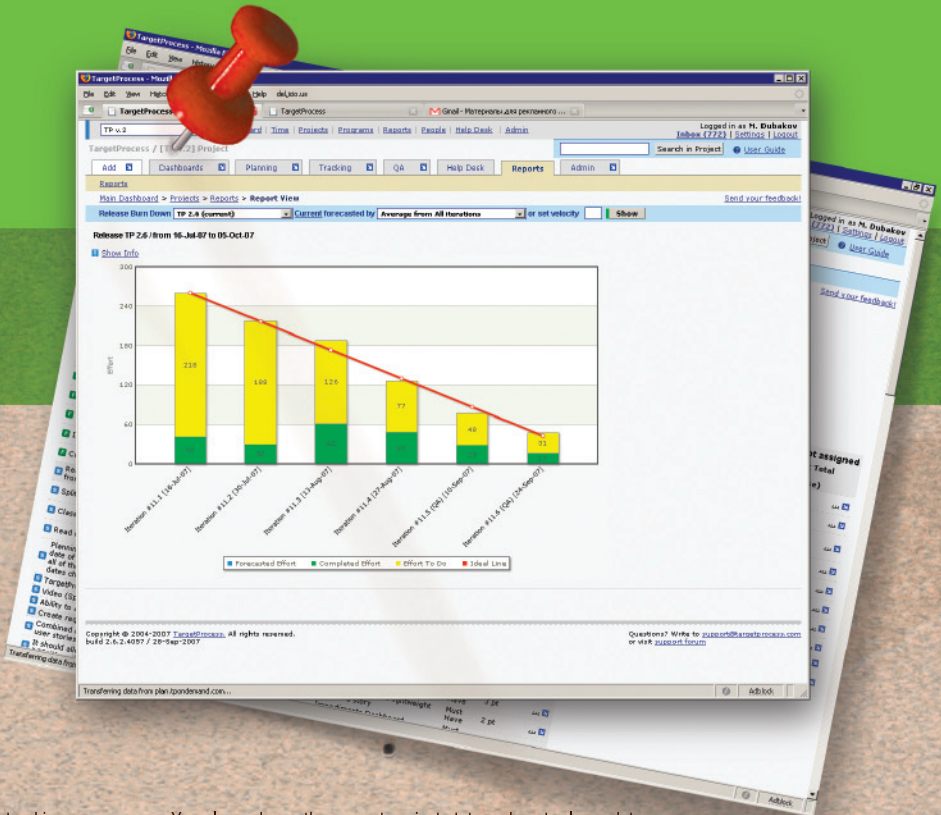


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DAVID ANDERSON has been a manager and leader of great software teams delivering cutting-edge software products since 1991. David has a successful track record of building progressively larger teams capable of hyper-productive performance and superior quality. He helped found the Agile Project Leadership Network (APLN)—a not-for-profit organization dedicated to encouraging better leadership and management in the IT sector. David is a current board member and a signatory of the Declaration of Interdependence, which documents the core values on which the APLN is founded. David specializes in cultural change for institutionalized, long-lasting implementation of lean and agile software development teams. Contact David at [dja@djandersonassociates.com](mailto:dja@djandersonassociates.com) or [www.djandersonassociates.com](http://www.djandersonassociates.com).



MICHAEL BOLTON lives in Toronto and teaches heuristics and exploratory testing in Canada, the United States, and other countries. He is co-author, with James Bach, of *Rapid Software Testing* and a regular contributor to *Better Software* magazine. Contact Michael at [mb@developsense.com](mailto:mb@developsense.com).



KEN YOUNG, vice president of process and quality at CA, has more than twenty years of experience managing software development projects.



REX BLACK is president of RBCS ([www.rbcs-us.com](http://www.rbcs-us.com)), a leader in software, hardware, and systems testing, providing consulting, outsourcing, and training services to clients on six continents. His first book, *Managing the Testing Process*, has sold more than 30,000 copies around the world, including Japanese, Chinese, and Indian releases. His other books on testing, *Critical Testing Processes*, *Foundations of Software Testing*, *Pragmatic Software Testing*, *Advanced Software Testing: Volumes I and II*, also have sold worldwide with five foreign language editions. He has written more than twenty-five articles; presented hundreds of papers, workshops, and seminars; and given about thirty keynote speeches at conferences and events around the world. Rex is the president of the International Software Testing Qualifications Board.



YURI CHERNAK, Ph.D, is the president and principal consultant of Valley Forge Consulting, Inc. Yuri has worked for a number of major financial firms in New York, leading QA governance committees in IT and helping clients improve their software requirements and software testing practices. Yuri is a pioneer in implementing a new discipline—aspect-oriented requirements engineering—for financial applications on Wall Street. He is a member of the IEEE Computer Society, has been a speaker at several international conferences in the US and Canada, and has published papers in the IEEE publications and other professional journals. Contact Yuri at [ychernak@yahoo.com](mailto:ychernak@yahoo.com).



LEE COPELAND has more than thirty years of experience in the field of software development and testing. He has worked as a programmer, development director, process improvement leader, and consultant. Based on his experience, Lee has developed and taught a number of training courses focusing on software testing and development issues. Lee is the managing technical editor for *Better Software* magazine, a regular columnist for *StickyMinds.com*, and the author of *A Practitioner's Guide to Software Test Design*. Contact Lee at [lcopeland@sqe.com](mailto:lcopeland@sqe.com).

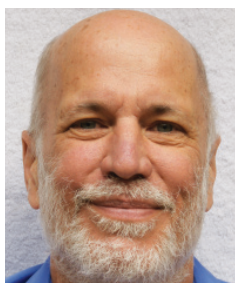




**LINDA G. HAYES** is a founder of Worksoft, Inc., developer of next-generation test automation solutions. Linda is a frequent industry speaker and award-winning author on software quality. She has been named one of *Fortune* magazine's People to Watch and one of the Top 40 Under 40 by *Dallas Business Journal*. Linda is a regular columnist and contributor to StickyMinds.com and *Better Software* magazine, as well as a columnist for *Computerworld* and *Datamation*, author of *The Automated Testing Handbook*, and co-editor with Alka Jarvis of *Dare to be Excellent*. You can contact Linda at [linda@worksoft.com](mailto:linda@worksoft.com).



**PETER NASH** has more than twenty years of experience in building world-class software and technology solutions. Experienced in both early stage ventures and large corporate environments, he brings a balanced perspective to technology development. Peter has contributed a visionary perspective in helping companies reach their business goals through the development and deployment of mission-critical applications in the finance, high-tech, healthcare, and media industries. Additionally, he is an internationally certified project manager and holds a six sigma green belt. Contact Peter at [peter@cliffjump.com](mailto:peter@cliffjump.com).



**KEN PUGH** is a fellow consultant with Net Objectives. He consults, trains, mentors, and testifies on technology topics ranging from object-oriented design to Linux/Unix to system development processes. Ken has written several programming books, including the Jolt Award-winning, *Prefactoring*, and has served clients from London to Sydney. When not computing, Ken enjoys snowboarding, windsurfing, biking, and hiking the Appalachian Trail. Contact Ken at [ken.pugh@netobjectives.com](mailto:ken.pugh@netobjectives.com).



**JOHANNA ROTHMAN** is a management consultant and a regular columnist for StickyMinds.com and *Better Software* magazine. Johanna is the author of the recently published *Manage It! Your Guide to Modern, Pragmatic Project Management*, as well as the co-author of *Behind Closed Doors* and author of *Hiring the Best Knowledge Workers, Techies & Nerds*. She is a host of the Amplifying Your Effectiveness (AYE) Conference. Johanna has presented at STAREAST, the Better Software Conference & EXPO, Agile Development Practices, and Applications of Software Measurement & Management conferences. You can reach her at [jr@jrothman.com](mailto:jr@jrothman.com) or visit [www.jrothman.com](http://www.jrothman.com).



**MICHELE SLIGER** has extensive experience in agile software development, having worked in both XP and Scrum teams before becoming a consultant. As a self-described "bridge builder," her passion lies in helping those in traditional software development environments cross the bridge to agility. Her book *The Software Project Manager's Bridge to Agility* (with co-author Stacia Broderick) focuses on that topic, helping PMI-trained project managers make the transition. A Certified Scrum Trainer (CST) and a certified Project Management Professional (PMP), Michele can be reached at [michele@sligerconsulting.com](mailto:michele@sligerconsulting.com).



## EDITOR'S PICK



**Francesca Matteu**  
Editor, StickyMinds.com  
fmatteu@sqa.com

### Powerful Customer Service

One of Central Florida's electric utility companies has a great service for homeowners looking to lower electric bill charges. If you sign up for this service, a field representative will come out to your home and assess how energy efficient it is—free of charge! As a new homeowner, my head was full of questions like, "Is the AC ducting in this house in good condition?" and "Is my water heater set too high?" This opportunity just seemed too good to decline, so I signed up for an inspection.

The walk-through inspection revealed a slew of little repairs that—once done—could possibly lower the electric bill. The representative inspected major appliance settings, water temperatures, windows, window and door seals, insulation in the attic, and the AC duct work and then offered suggestions on how all these items could function more efficiently if readjusted or renovated. The inspection seemed extremely thorough and detailed, but the real surprise came during the debriefing. Not only did the representative take the time to share with me his findings and suggestions on how I could make my house more energy efficient, he also informed me of additional programs I'm qualified for if I were to follow through with some of his suggestions. More savings for me!

Moreover—and this part really made me smile—he gave me a bag of goodies that contained free CFL bulbs, seals for the outlets, temperature gauges for the refrigerator, weather stripping for the door, and a nice hand bag to top it all off.

Obviously there's a lot of value to this service. Both parties win in this situation; homeowners save money on their electric bills—hopefully—by consuming less energy, and the energy company saves in operation costs and is in a position to possibly sell extra energy to other grids. The big picture of savings is quite impressive, but for me it was the little things that made the whole experience a positive one.

One of my favorite articles on StickyMinds.com can be used to describe this experience. In "The Forgotten Side of Quality" Jeff Patton discusses the objective and subjective sides of perceived quality. He also delves into the Kano Method, a questionnaire designed to help categorize features of software as must-haves, one-dimensional items, and attractive qualities or "delighters." The article is a great read into the logical, yet philosophical, aspect of what defines software as being high quality.

The article defines my experience well because the reactions I had to the features of the program were subjective. Being a big fan of little perks, I couldn't agree more with Jeff when he suggests that anyone designing software should consider objective and subjective qualities as equals when deciding what features to build.

As previously mentioned, the inspection was filled with different types of features, some I believe to be essential to the inspection and others that were just pure delighters. What impresses me most about the program is that the energy company has done an excellent job mixing in must-haves, one-dimensional items, and delighters. It also helped that the field representative was extremely helpful and answered all of my questions to the best of his ability—a must-have for me.

Learn more about perceptions of quality, objective and subjective factors, the Kano method, and how Aristotle comes into this discussion in "The Forgotten Side of Quality" at:

[www.StickyMinds.com/editorspick11-1](http://www.StickyMinds.com/editorspick11-1)

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# The TSA and Software Testing

by Lee Copeland

“TSA screener testing labeled ‘a waste’” is the USATODAY.com headline [1]. The article states, “A government program to find gaps in airport screening is ‘a waste of money’ because it doesn’t follow up on why screeners failed to spot guns, knives, and bombs on undercover agents,” the head of the House Homeland Security Committee says. “You have a system that’s supposed to strengthen airport security, but you don’t use the results of the tests to do exactly what you’re doing the tests for,” said Bennie Thompson, D-Miss. “It’s obviously a waste of money.”

If this story seems vaguely familiar, just substitute a few nouns. Replace “TSA” with “your organization”; replace “bombs” with “software defects,” and now it becomes clear. Most organizations fail to learn very much from the information that testing provides.

## Measuring the Quality of the Product

Almost everyone uses the results of testing as an indicator of product quality—many defects usually means poor quality; few defects, well, that’s more complicated. It could mean that the product is of good quality. It could also mean that our testing is not effective in finding the defects.

But, there is much more to be learned from the results of testing.

## Measuring the Quality of the Tests

Measuring the quality of an individual test case is difficult. If a test case never finds a defect, does that mean it is a poor test? While some testing experts say yes, the fact that the test case passed (assuming it is well designed, implemented, and executed) provides valuable information. It tells us there are no defects in the area it has tested. And knowing that lets us focus our limited resources elsewhere.

Measuring the quality of a suite of

test cases is substantially easier. A key metric is test coverage (the percentage of the test object that has been “covered” by the test suite). Coverage is generally defined at the requirements level and at the code level. While low coverage numbers (0 percent to 50 percent) frighten me, high coverage numbers (80 percent to 100 percent), while impressive, don’t guarantee defect-free code.

For example, with only one test case, we can achieve 100 percent code coverage on this simple program:

```
Int blech ( int p, int q) {
    return p/q;
}
```

But it contains a fault—it will fail when  $q$  is 0.

## Measuring the Quality of the Development Process

The great quality guru Edwards Deming believed that approximately 80 percent of all product defects come from the process being used, while only 20 percent come from individual worker’s mistakes. The results of testing can tell us much about the quality of the development process. For example, if a certain type of defect is created again and again, those defects are not coming from individual mistakes; they are coming from the development process itself. Deming explains who is responsible for improving the process. He said the staff works within the process; it’s management’s responsibility to work on the process to improve it.

## Measuring the Quality of the Testing Process

One of the most effective metrics for measuring the quality of the testing is defect detection percentage (DDP). In its simplest form, DDP is defined as the per-

“If a test case never finds a defect, does that mean it is a poor test?”

centage of the number of defects detected by all testing efforts divided by the total number of defects found (both by testing and by customers in the field). DDPs in the range of 0 percent to 50 percent indicate that our testing process is very ineffective. DDPs above 90 percent indicate our testing is effective (only one out of ten defects is escaping into the field). However, for some products and industries, DDPs of 99 percent or more are required.

Once this simple form of DDP is measured, used, and institutionalized, consider breaking “testing” into levels such as unit, integration, system, and acceptance and measuring DDP at each level. If, for example, the DDP of unit testing was significantly lower than the other DDPs, this could indicate that the unit tests were not well designed or implemented. On the other hand, it could indicate that the units themselves are well defined and well implemented, but the interfaces are poorly defined and so defects are found later in testing.

One final word on measuring—the metrics, the numbers themselves, rarely point directly at the problem. Often, they are more like a red flag waving to indicate that there is a problem somewhere. Before jumping to conclusions about the problem and its potential solution, remember Jerry Weinberg’s “Rule of Three”: *If you can’t think of at least three different interpretations of a metric, you haven’t thought enough about what it might mean. And that means you haven’t thought enough about the solution.* {end}

### REFERENCES:

- [1] Frank, Thomas. “TSA Screening Labeled a Waste.” *USA Today*. November 14, 2008. [www.usatoday.com/travel/flights/2008-08-13-tsatests\\_N.htm](http://www.usatoday.com/travel/flights/2008-08-13-tsatests_N.htm)



# A Path to Readable Code

by Ken Pugh

Recently I was reviewing the agile development process at a client where the development group was implementing acceptance test-driven development. The client's agile teams include both a business analyst and a system tester. Working together, they are developing acceptance tests using the Framework for Integrated Testing (FIT). FIT tests are represented by tables embedded within HTML pages. Each table specifies test cases consisting of values of inputs and expected outputs.

When creating test cases, text-based business rules are converted to tables that give examples of those rules. For instance, suppose the business rule for giving a discount is:

If Customer Rating is Good and the Order Total is less than or equal \$10.00,  
     Then do not give a discount,  
     Otherwise give a 1% discount.  
 If Customer Rating is Excellent,  
     Then give a discount of 1% for any order.  
 If the Order Total is greater than \$10.00,  
     Then give a discount of 5%.

These requirements might be interpreted in multiple ways. For example, if the rating is excellent and the order is greater than \$10.00, is the discount 1 percent or 5 percent? Using a table to illustrate the rule can decrease misinterpretation.

DiscountFixture		
orderTotal	customerRating	discountPercentage ()
10.00	Good	0.0
10.01	Good	1.0
.01	Excellent	1.0
10.00	Excellent	1.0
10.01	Excellent	5.0

Table 1

```
class DiscountFixture extends fit.ColumnFixture {
    public double orderTotal;
    public CustomerRating customerRating;
    public double discountPercentage() {
        // Calls the method that computes the
        // discount and returns the discount
        return computeDiscount(orderTotal,
                               customerRating);
    }
};
```

Listing 1



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Table 1 gives examples of this business rule.

The FIT framework transforms this table into calls to a fixture. Fixtures convert the values in an HTML table to assignments to variables and the execution of methods. User-written fixtures inherit from predefined classes provided by the FIT framework. The variables and methods are defined by the column headers. A header with the “()” suffix denotes a method. For each row in a table that references a column fixture, FIT sets the variables, executes the method, and compares the returned result to the expected value in the method column.

The name of the fixture DiscountFixture is the first line of the table. The fixture has public data members with the names orderTotal and customerRating and a public method called discountPercentage(), which returns a percentage (implemented as a double). Listing 1 shows how this fixture would be implemented in Java.

Assume that CustomerRating is an enumeration with a method that converts a string such as “Good” to a constant as CustomerRating.GOOD;

Creating this table in advance of coding helps clarify the requirements of the system. It also helps the developer create a readable set of tests. In my book *Prefactoring* [1], I give some guidelines for readability. One of them is to “Use the Client’s Language.” Within the FIT table, the client has specified the requirements in his own language. The names of the table columns should be used in the code that implements the business rules. For example, the method should look something like:

```
double computeDiscount(double orderTotal,
                       CustomerRating customerRating);
```



```

public class CustomerDiscount {
    Percentage computeDiscount(Dollar orderTotal,
        CustomerRating customerRating) {
        if (customerRating == CustomerRating.GOOD) {
            if (orderTotal.lessThan(new Dollar(10.00)))
                return new Percentage(0.0);
            else
                return new Percentage(1.0);
        }
        if (customerRating == CustomerRating.EXCELLENT) {
            if (orderTotal.greaterThan(
                new Dollar(10.00)))
                return new Percentage(5.0);
            return new Percentage(1.0);
        }
        return new Percentage(0.0);
    }
}

```

Listing 2

```

public class Dollar {
    public Dollar(double value) { }
    public Dollar(String value) {}
    public static Dollar parse(String string) {}
    public boolean lessThan(Dollar other) { }
    public boolean greaterThan(Dollar other) {}
}

public class Percentage {
    public Percentage(double value) { }
    public static Percentage parse(String string) {}
}

```

Listing 3

orderTotal	customerRating	discountPercentage ()
\$10.00	Good	0.0%
\$10.01	Good	1.0%
\$.01	Excellent	1.0%
\$10.00	Excellent	1.0%
\$10.01	Excellent	5.0%

Table 2

```

DiscountByRatingAndOrderTotal = {
    { CustomerRating.GOOD, new Dollar(0.0),
      new Percentage(0.0) },
    { CustomerRating.EXCELLENT, new Dollar(10.0),
      new Percentage(1.0) },
    //. . .and so forth
}

```

Listing 4

In the event that the client specifies the column headers as “ord\_tot”, “cust\_rat”, and “disc”, then you should use those as the names of the parameters and the method name in the FIT table. That avoids having to do a mental translation of terms during communication between the client and the developers.

Now, you can take another step and apply the “When You’re Abstract, Be Abstract All the Way” guideline. The values representing orderTotal and discountPercentage() are often represented by doubles. But that’s an implementation issue. The client refers to them as dollars and percentages. Separating implementation from use guarantees more readable code. So, create classes that represent these abstract data types. The computeDiscount() method is shown in listing 2.

This Java may look a little odd to the client (particularly with all those “new” keywords). However, if the terms match those by which the client described the FIT columns or their business rules, the client should be able to understand it easily [2].

Since we’ve transformed doubles into Dollars and doubles into Percentages, we’ll need to create some methods in those classes to implement comparisons, as shown in listing 3.

The parse() methods are used by FIT to convert a string into the corresponding data type. With the appropriate conversion method, you can use the formatted strings in the FIT table. This usually makes it easier for the client to read the table. For example, if Dollar parse() could take a dollar sign and Percentage parse() could take a percent sign, then the table could be written as in table 2.

As the business rules become more complicated, you’ll probably want to insert them into a table, as shown in listing 4.

Now, how can one perform arithmetic with Dollars? Create methods, as in listing 5.

You pick one, depending on whether or not you want to make Dollar immutable. What other things might you want to do with a Dollar? You might need to multiply a Dollar by a Percentage. Which gives you:

```
Dollar multiplyBy(Percentage other) {}
```

These methods may make your code look almost like COBOL, but if you are dealing with business terms, then it may not necessarily be bad for it to look like a “common business oriented language,” as shown in listing 6.

Is it worth it to create a class called Dollar? After all, it is just a double (or should it be a Big-Decimal?). Having the Dollar class hides these



```
class Dollar {
    public static Dollar add (Dollar one, Dollar two);
    // or
    public void add (Dollar another);
    // or
    public Dollar add (Dollar another);
};
```

Listing 5

implementation details and keeps the formatting and string interpretation in one place. Following the “Don’t Repeat Yourself” rule makes for consistency. Who should better know how to format a Dollar than the `Dollar` class itself?

```
Dollar myDollar;
Dollar discountAmount = myDollar.multiplyBy
    (discountPercentage());
```

Listing 6

Simply multiplying a double by a double that yields a double does not handle all real-life issues. When you create a method called `multiplyBy (Percentage other)`, then you may have the impetus to discuss with the client what issues are involved. In implementing the method, you may realize that rounding is involved and you are not sure how to deal with it, so ask the client.

Suppose the client responds that rounding is a case of “Well, it all depends on the context.” Then, you can either create two methods (`multiplyByRoundUp` and `multiplyByRoundDown`) or add a parameter (called `RoundingType` having values `ROUND_UP` or `ROUND_DOWN`) to `multiplyBy()`. In addition, having a `multiplyBy ()` method permits a single place where you can accumulate all the pennies from rounding, so you can save them for a rainy day.

And what about Percentage? Having a data type of that kind should make it clearer that percentages should be expressed in terms of 1.0 percent rather than as a fraction of one (e.g., .01).

Before we conclude, let’s go abstract all the way. Let’s create a data type called `Count`. We’ll need to add some arithmetic methods to `Count`, as shown in listing 7.

We may find a need to add a method to `Dollar` called `Dollar multiplyBy(Count other)`—and maybe even a few more. But every time we do, we’ll be encapsulating another implementation, and separating the implementation from the use will make your code more readable.

```
class Count
{
    void increment();
    void decrement();
    Count add (Count another);
}
```

Listing 7

For business-related programs, you’ll probably have a small number of data types, such as `Dollar`, `Percentage`, and `Count`, that you’ll use over and over again. The work involved in creating a set of data types and the associated arithmetic methods will pay off. For scientific programs, you may find the number of data types keeps growing. Every new data type may require more arithmetic methods to interact with the existing data types, such as dividing a length type by a time type to get a speed type. But chances are there are more

limited interactions between these data types, and the necessary arithmetic methods will not rapidly approach unmanageable levels.

Creating acceptance tests not only helps define the requirements but also helps make the code more readable to the client. Using the client’s language makes the translation between client expectations and developer implementation much simpler. **{end}**

#### REFERENCES:

- [1] Pugh, Ken. *Prefactoring*. O’Reilly Media, Inc, 2005.
- [2] Mugridge, Rick and Ward Cunningham. *Fit for Developing Software: Framework for Integrated Tests*. Prentice Hall, 2005.



**What is your approach to dealing with the Dollar and Percentage concepts?**

Follow the link on the **StickyMinds.com** homepage to join the conversation.

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# Lucky and Smart

by Michael Bolton

Just after the Conference for the Association for Software Testing in Toronto in July 2008, I had the good fortune to spend an afternoon wandering through the Royal Ontario Museum with some colleagues. We were there for the featured exhibit, “The Evolution Revolution,” a survey of the life and work of Charles Darwin. Darwin is known as one of the greatest scientists in history. And, as the exhibit showed, he was also a remarkably lucky man.

For one thing, his famous voyage on the *Beagle* almost never happened. Darwin’s mentor and sponsor, John Henslow, had intended to take the ship’s naturalist position himself, but because he had a wife and a new baby, he decided against a long trip at sea. Henslow’s first choice for a substitute, Leonard Jenyns, also declined the position in favor of a new job. Robert Darwin, Charles’s father, forbade his son from going on the adventure but offered an out: “If one man of common sense assents,” he said, Charles would be permitted to go. Charles consulted with his uncle, Josiah Wedgewood. They overcame the elder Darwin’s objections, and, true to his word, Robert Darwin gave permission.

The *Beagle* set sail in late December 1831. While at sea in February 1832, Darwin recorded his excited realization that the voyage would allow him to observe geology in addition to biology and botany. Later that month, he arrived in South America to start exploring. His thinking was influenced by experiences with a group of gauchos north of the Rio Negro in August 1833. These men often hunted and ate a large flightless bird called the rhea. They told Darwin about a similar, smaller bird, but in spite of thorough searching, Darwin was unable to find a specimen. A few months later and several hundred miles south, near Port Desire, the ship’s artist, Conrad Martens, shot a small rhea and served it up for dinner. Not until halfway through the meal did Darwin recognize

what was sitting on his plate. He rescued the carcass—head, neck, bones, feathers, and a near-complete skin. Darwin realized that Martens hadn’t shot a *small* rhea, but a species different from the larger bird, with distinct plumage and eggs, later confirmed as the *lesser* rhea. This incident was

one of the triggers for Darwin’s nagging question—why do two similar but separate species often appear so close together?

The year 1835 brought a remarkable sequence of events. In January, Darwin happened to be present and recorded his observations as Mount Osorno erupted. On February 20, the town of Valdivia was struck by “the most severe earthquake experienced by the oldest inhabitant,” and Darwin was present for that, too. The quake flattened the town of Concepción and an ensuing tsunami drowned nearby Talcahuano. A few days later, Darwin recorded that the *Beagle*’s Captain FitzRoy had observed putrefying mussels ten feet above sea level—indicating that the coastline had risen by at least that much in just a few days. In April, while in the high passes of the Cordillera, Darwin recorded his observation of petrified trees that closely resembled the living trees thousands of feet below. In his journal, he linked his observations with the earthquake, concluding that the land rose slowly, by fits and starts, and that change could happen over enormous spans of time—which he later realized was enough time for natural selection to take its course.

Darwin observed carefully and took notes assiduously, but it’s impossible for one person to document everything or to anticipate what might be important. When he returned home, he brought with him an extraordinary collection of specimens, including many birds from



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the Galápagos Islands. Darwin believed that he had found several new species, but John Gould, an expert ornithologist, noted that despite their outward differences, they were all finches. Gould also noted that Darwin had unwittingly bagged three new species of mockingbirds. Darwin realized that while the birds were all from the same region, they were from different islands, but he hadn’t kept exact records of the specific island on which each specimen had been found. Fortunately, Captain FitzRoy had collected many of the same species, and he had kept notes that allowed Darwin and Gould to determine the provenance of the birds.

The Museum’s wonderful Darwin exhibit resonated with a number of ideas about testing. Many of us started our careers as testers by accident. As we reflect on what we’re going to test, we often expand our models of what we’re going to cover. We’re often lucky enough to make important observations and discoveries by a combination of diligence and chance. We often make incomplete observations or keep imperfect records—but we can compensate for that with teamwork. We might not obtain all the answers, but we can often get partial answers that might be sufficiently useful to trigger better questions, more complete answers, and deeper understanding.

FitzRoy had planned the journey diligently, but much of what he and Darwin discovered was unplanned and unscheduled. Darwin was a brilliant observer



and scientist, to be sure, but many of his insights were triggered by serendipity and luck.

Good testing is like that. Even when someone tests incompetently or aimlessly, he obtains some product coverage—and may trip over some bugs by accident. A more capable or better-prepared tester typically tests more deliberately, consciously, and intentionally, but still may obtain some coverage incidentally, unconsciously, or accidentally. We never know what we might find—and sometimes we don't even know immediately that we're finding it. If we're executing functional tests on a pocket calculator, for instance, and the answer appears quickly, we've achieved some kind of performance coverage whether we notice it or not. Conversely, I was investigating connectivity features on a mobile phone recently. Even though the phone connected properly, I experienced a noticeable and annoying delay in the user interface. I had found a performance problem, even though I hadn't set out to find that kind of problem. That's

why test evaluation shouldn't stop with a passing or failing test; in excellent testing, we continuously look around and ask, "Is there a problem here?"

When we're engaged in testing, we're constantly exploring, observing, and evaluating—or anticipating those activities, as Darwin was in the first month of the voyage. At any point, an observation, a pause, or a distraction might bring a new discovery or an expanded notion of test coverage. When I stumble on something, I ask myself, "Is there another quality criterion that I could consider that might matter to some client? Have I seen something like this before? Are there more things like this that I could compare? Are there more places like this to look? Are there more places where I can apply this way of looking?"

Traditional writing about testing provides plenty of focusing heuristics in the form of specific techniques to perform and conditions to watch out for. But it's also important to consider the dynamic between focusing and defocusing—paying attention to details, then

zooming out to the big picture and back again. When you're observing an ant, defocus occasionally to see the colony and its dynamics. When you're looking at the anthill, pause every now and again to check the behavior of individual ants. When you've done both for a while, take a break and come back to maximize the opportunity to see new things with the same old eyes.

A postscript: As I was finishing this article, I needed to refer to some material on Darwin, and I also needed a title. I opened up my browser history and noticed that one of the articles that I had been reading before starting to write—an article that had nothing to do with Darwin or testing—was titled "Better To Be Lucky Than Smart." As testers—like Darwin—we need to be both. **(end)**



**What can testers learn from other scientists and other disciplines?**

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# Questions You Should Ask

by Michele Sliger

A long time ago I saw a comedy routine by Bill Cosby that really resonated. He described a scene where he was frustrated by a young woman's behavior in a public place and had decided to confront her. Her response to everything he said was (picture a hand on the hip and some serious attitude) "So?" The conversation went something like this:

**Bill Cosby:** I saw what you did.

**Young Woman:** So?

**BC:** So you need to stop that. You're upsetting those around you.

**YW:** So???

**BC:** So it's rude, and it's not fair to everyone else.

**YW:** So???

**BC:** So that's not how civilized people are supposed to behave!

**YW:** So???

**BC:** So this is how society works! You have to have manners! People can't live together without rules of decorum!

**YW:** SOOOOOO???

Cosby was increasingly funny as he described his indignation at how this one little word, uttered over and over again, drove him finally to walk away.

Fast forward to current events where I find myself doing retrospectives with teams who are learning about better ways to develop software. Many are familiar with the Five Whys, one of the analytical tools of the Six Sigma approach to process improvement. This technique, often used in retrospectives or other problem-solving meetings, is designed to get to the true root of the problem. By asking "why" five times, it enables the team to drill down into the underlying cause of the problem, and then solve it. Five Whys conversations play out like this:

**Team Member:** We aren't able to ship the widgets.



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**Facilitator:** Why?

**TM:** Because the boxes aren't the right size.

**F:** Why?

**TM:** The boxes were just a standard stock order, without consideration for the odd size and fragility of the widget.

**F:** Why?

**TM:** The warehouse manager says that everything is considered standard stock unless there is an XJ-912 form filed by the floor manager. Our floor manager did not submit the form.

**F:** Why?

**TM:** Because he didn't know about it.

**F:** Why?

**TM:** He's new, and training on warehouse procedure is not part of the floor manager's training program.

In this example we learn about the real problem behind the inability to ship widgets and can take steps to ensure that the likelihood of this type of incident happening again is lessened.

Now imagine combining both "why" and "so" questions in a problem-solving discussion (without the hand-on-hip attitude):

**Team Member:** We can't design our new phone product this way.

**Facilitator:** Why?

**TM:** Because our customers would lose all their existing voicemail messages when we made the switch.

**F:** So?

**TM:** So that would be bad, right? We can't ask them to say goodbye to all their saved voicemail ... can we?

**F:** Why not?

**TM:** Yeah, why not? If the customer won't miss those saved voicemails, then we can completely redesign this phone system to take advantage of the new platform!

The "why" questions enable us to discover the points of failure, while the "so" questions enable us to learn more about the business value linked to the issue. Would the customers be upset at losing voicemail messages? First, we must decide who could best answer this question about the value this product feature provides to the customer. In most organizations it is the product owner who can speak with the voice of the customer and provide the design team with the important insight it needs to help spark innovation in de-



## STORY LINES

- Remember that attitude is important when you ask so, why, and why not—so be genuinely curious and genuinely courteous.
- “Why” questions enable us to discover the points of failure, while “so” questions enable us to learn more about the business value linked to the issue.

sign and problem solving. This product owner is a customer-facing role and typically works in marketing. Including the product owner in the problem solving ensures that a more well-rounded solution will be developed, one that satisfies proper design considerations as well as providing a useful and valuable asset to the customer.

Challenging teams with “so” not only forces them to justify their logic, but it also helps them to begin thinking outside the box. What might the widget conversation have looked like if we’d challenged the team to be creative in that situation?

**Team Member:** We aren’t able to ship the widgets.

**Facilitator:** Why?

**TM:** Because the boxes aren’t the right size.

**F:** So?

**TM:** So the widgets don’t all fit in the standard-size box, and they need special packaging so they don’t get broken.

**F:** Why?

**TM:** Because they’re fragile, and we don’t have any support packaging designed for them yet.

**F:** So?


**TM:** So, what are you asking? Do you expect us to ship them without the special packaging?

**F:** Why not?

**TM:** Well, maybe we could ... if we used enough bubble wrap. We might be able to ship the widgets in multiple boxes, using extra bubble wrap and Styrofoam peanuts. Let me see if that will work.

Using “why” and “so” seems inevitably to lead us to “why not,” and this is how teams transition to being creative and innovative. In software development, the “why not” may be aimed at technologies as well as business value. Be sure to include your product owners in these discussions so that they, too, can ask and answer the “so” and “why not” questions. In today’s highly competitive marketplace, asking “why” is only the beginning! {end}

**Note:** This article originally appeared on StickyMinds.com.

 **What other questions have you tried asking in order to break others out of the assumed model?**

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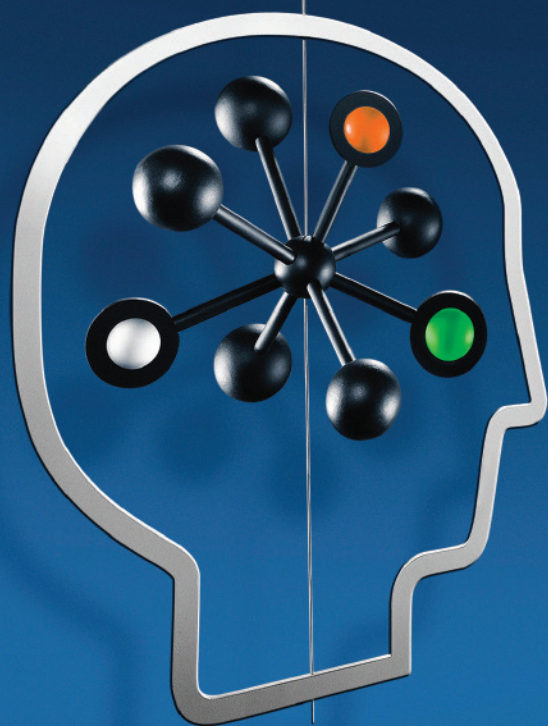
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## HP Software application lifecycle: a better fit for a new breed of applications

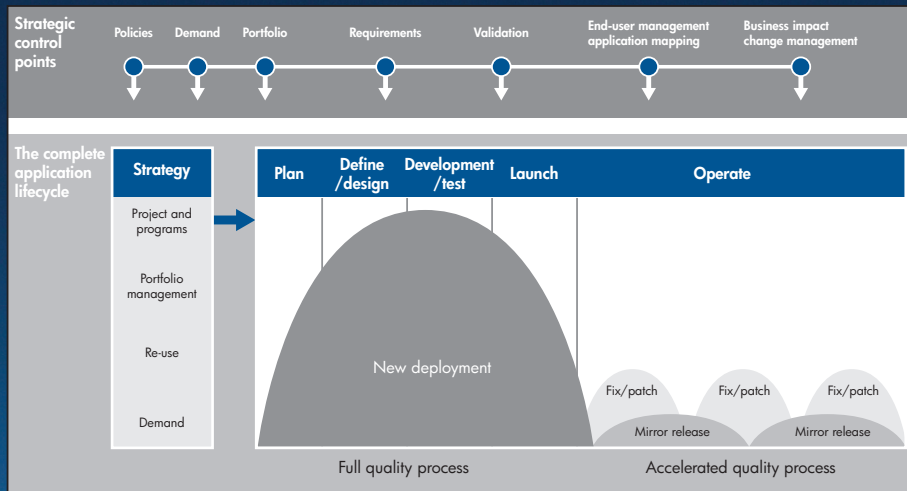
The most recent wave in application modernization is gaining in both speed and strength. This modernization touches almost all aspects of the IT enterprise, turning local and dedicated teams into virtual and distributed ones, re-shaping applications from stove-pipe to composite entities, enriching user experience via Web 2.0 technologies, and drawing release management away from singular launches toward comprehensive “release trains.”

How should IT organizations manage – and maximize – these modernization trends? HP’s approach to Application Lifecycle Management (ALM) helps to ensure modernization initiatives remain framed by the business’s goals. Jonathan Rende, Vice President of Product Marketing, explains how.

“The most significant application refresh the industry has seen in 20 years is underway right now,” says Rende. “The trick is to align modernization initiatives with business objectives. The **complete** application lifecycle is actually much broader than the traditional software development lifecycle [SDLC]. HP recognizes this and places more emphasis on ‘upstream’ activities, such as business strategy and planning, as well as ‘downstream’ efforts such as upgrades, patches and maintenance.

“The traditional view of the application lifecycle was developer-centric and focused on the launch date,” continues Rende. “But when you look comprehensively at the work to build and manage an application, only about 20 percent of the time and effort goes into the development and delivery phase; the majority of the effort is spent on maintaining applications running in production. The true application lifecycle not only supports, but integrates, these key activities—everything from the strategic value of the application, to the actual development and testing processes, to change management and other operational issues. The HP approach supports all of these activities.”



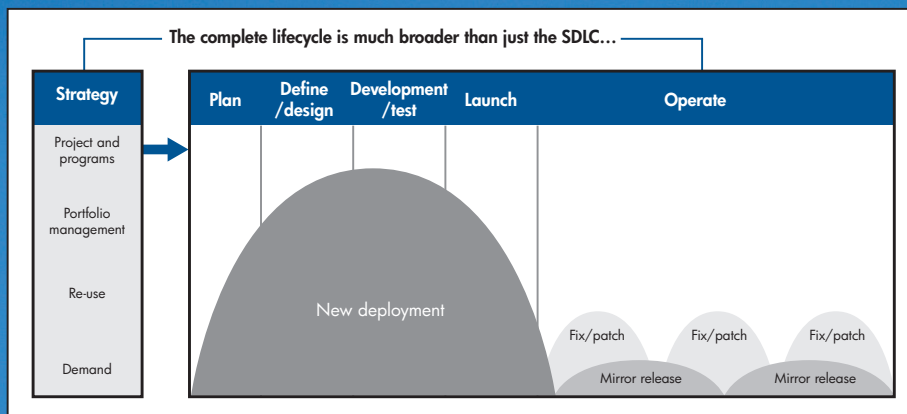


Central to the HP approach is the concept of "strategic control points" in the application lifecycle. These critical activity or decision points sanity-check downstream business and technical consequences at every stage of the application lifecycle. "...it might make little difference in the end if the application is written in Java™ or .NET," says Rende, "but it is critical that the business requirements are established properly, the application is validated against those requirements, and that there is traceability to ensure that the functionality, performance and security outlined in the business requirements is what was delivered in the final application."

Equally important, the HP approach is the first to truly integrate security into the QA process. Rende adds, "All too often, security initiatives have been perceived as separate from—or even working in opposition to—traditional QA goals. Managing quality along the entire application lifecycle helps companies control costs and risks while ensuring that their software applications are aligned with the business goals."

## Get the details

HP Software can help your organization get beyond "quality management as usual" and make the move to the real application lifecycle. By optimizing the functionality, performance and security of applications, IT can have a direct impact on business results. For details about HP's ALM offerings visit [www.hp.com/go/alm](http://www.hp.com/go/alm) and download the white paper entitled "Redefining The Application Lifecycle."



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# **RISK-BASED TESTING** **In Action**

**Increase Quality Using  
the Same Resources**

**BY REX BLACK, PETER NASH & KEN YOUNG**







This article presents a case study of a risk-based-testing pilot project at CA. The development team chosen for this pilot is responsible for a widely used mainframe software product called CA SYSVIEW Performance Management.

Companies are highly dependent on the reliability of their mainframe systems. If the mainframe doesn't run, the company stops. Mainframe workloads also are growing considerably as companies grow and as they continually seek to leverage data and applications in new ways.

At the same time, these companies are losing their experienced mainframe workforce, largely to retirement. This makes the quality of their mainframe management tools even more important to them.

CA piloted risk-based testing as part of a larger effort to ensure the quality of the solutions it delivers. The pilot consisted of six main activities:

- Training key stakeholders on risk-based testing
- Holding a quality risk analysis session
- Analyzing and refining the quality-risk analysis
- Aligning the testing with the quality risks
- Guiding the testing based on risks
- Assessing benefits and lessons

This article addresses each of these areas, as well as some of the broader issues associated with risk-based testing.

## What Is Risk-Based Testing?

Generally speaking, risk is the possibility of a negative or undesirable outcome or event. Testing is concerned with two main types of risks:

- Product or quality risks—problems that can potentially affect the quality of the product itself, such as a defect that could cause a system to crash during normal operation
- Project or planning risks—problems that can potentially affect overall project success, such as a staffing shortage that could delay completion of a deliverable

Of course, not all risks are equal, and there are a number of ways to classify the different levels of risk. The simplest is to look at two factors:

- The likelihood of the problem occurring, which depends primarily on technical considerations such as the programming languages used and the constraints of a given computing platform
- The impact of the problem should it occur, which depends primarily on business considerations such as the financial impact of system downtime or the amount of lost staff productivity

Risk-based testing is guided by the level of risk associated with items identified during analysis. Although risk can guide testing in various ways, there are three common ones.

First, during all test activities, test teams allocate effort to each quality-risk item based on the relative level of risk. Test managers and analysts align the rigor and extensiveness of test techniques with the level of risk. They carry out test activities in risk order, starting with the most important risks. They also work with the project team to prioritize resolution of discovered defects based on the level of risk.

Second, test managers implement control steps for all significant, identified project risks. A control step is either mitigation (something done in advance to reduce the likelihood or impact of a risk) or a contingency (something you are prepared to do to reduce the impact if the risk becomes an event). The higher the level of risk, the more thoroughly that project risk is controlled. These project risks must include risks related to testing itself, since problems during test execution can reduce test scope and thereby result in quality risks.

Third, test managers and test analysts report test results and project status in terms of residual risks. Which tests have been run and which haven't? Which have passed? Which have failed? Which defects have not yet been fixed or retested? How do the tests and defects relate back to the risks?

In other words, with risk-based

Portions of this article are excerpted from Rex Black's book, *Advanced Software Testing Volume 2: Guide to the ISTQB Advanced Certification as an Advanced Test Manager*, from Rocky Nook.



testing, risk management is an ongoing event. The above three responses to risk occur throughout the project lifecycle. Quality risks are mitigated by running tests, and project risks are mitigated by controls. Risks and risk levels are periodically re-evaluated based on new information, and, if necessary, priorities, allocation of effort, and project controls are modified.

## Why Adopt Risk-Based Testing?

All testing faces two serious challenges. First, the set of possible test cases is infinite. So, if test coverage is measured by dividing the number of tests run by the number that could have been run, test coverage is always zero percent ( $n/\infty = 0$ ). In fact, testers always select a relatively small subset of tests from the set of tests that they could possibly run, so they have to be very smart about that selection. Selection based on risk makes the most sense both in terms of product quality and project success.

Second, because projects cannot take an infinite amount of time, all testing is “timeboxed” but the timebox is not a fixed size. Changes in upstream task durations for the project often compress the timebox for subsequent testing. The risk-based prioritization of tests directly addresses this challenge. By prioritizing tests according to both likelihood and impact, testers give themselves the best possible chance of discovering the worst possible problems. Also, at any given time during the test execution period, the tests that have been run are more important than the tests that have not yet been run. This allows test managers to make risk-based test “triage” decisions to meet inflexible project deadlines—thereby minimizing the risks associated with any reduction in the scope of testing.

An assessment of CA’s testing processes indicated that CA faced challenges regarding both coverage and time constraint. The adoption of risk-based testing, therefore, seemed a wise choice.

## Training Key Stakeholders

The first step in our pilot project was a one-day, risk-based testing workshop that covered the following topics:

- The basic principles of and rationale for risk-based testing

Likelihood	Rating	Comments
Very likely	1	Almost certain to happen
Likely	2	More likely to happen than not to happen
Somewhat likely	3	About even odds of happening
Unlikely	4	More likely not to happen than to happen
Very unlikely	5	Almost certain not to happen

Table 1: Likelihood rating scale for risk items

Impact	Rating	Comments
Must fix now	1	Top-priority, “come in on Sunday” type of issue
Must fix schedule	2	Schedule for attention and resolution as quickly as possible
Should fix	3	A major irritant but might not receive attention until other issues are addressed
Good to fix	4	An irritant for some number of customers that will cause some concern unless resolved
Don’t fix	5	No or limited value to fixing this problem

Table 2: Initial impact rating scale for risk items

Quality Risks Analysis Form											
1											
2	System Name: SYSVIEW										
3	Product Manager: Bob Carpenter										
4	Project Manager: [Jim Please complete]										
5	Test Manager: Jim Kaste										
6	Stakeholders in Risk-Based Analysis Session: Jim Kaste, Jim Cozy, Jim Gubala, David Jones										
7	Phyllis Carella, Bob Carpenter, Jim Williams										
8											
9											
Risk ID Number	Quality Risk Category	Specific Quality Risk	Likelihood	Impact	Impact Rating	Impact of Pending	Other Action Needed	PFSA/DPS Tracking	Total Items	Total Rated	Percent Rated
1000	Functionality	Failures that cause specific features not to work	4	3	12				24	19	79%
1001		Unix System services compatibility issue	3	5	15						
1002		MQ Agent not properly removed from product	3	2	6						
1003		Data collection changes incorrect	3	2	6						
1004		Incompatibility with previous Sysview	5	2	10						
1005		New commands do not function.	TBC/TBC	#			[Jim: Might need to break this out for each new command?]				
1006		Changed commands do not function	TBC/TBC	#			[Jim: Might need to break this out for each new command?]				
1007		Data lib commands don't work	3	2	6		[Jim: Might need to break this out for each command?]				
1008		Problems with exploitation of z/OS 1.10 functionality	3	TBC	#		[Jim: Need to get list of 1.10 functions to determine impact.]				
1009		Audit logs too vague	TBC/TBC	#							
1010		System overview changes incorrect	4	5	20						
1011		Parallel (overlaid) compatibility issues	5	2	10						
Project Risks / Miscellaneous / Risk Levels and Test Extent / Initial QRA /											

Figure 1: Quality risk analysis worksheet at end of risk analysis session

- Understanding categories of quality risks (functionality, performance, reliability, usability, etc.)
- How to perform a quality risk analysis and align testing with risk levels
- How to document quality risks
- How to monitor quality risks during test execution and report risk-based test results

In addition to the formal presentation, we had an open discussion and a two-hour, hands-on exercise based on a hypothetical project, enabling attendees to explore the real-world issues presented by risk-based testing.

## The Quality Risk Analysis Session

The quality risk analysis session consisted of two sub-sessions. During

the first, the participants identified as many quality risk items as possible using brainstorming techniques. We listed the main quality risk categories on three whiteboards, then the participants wrote each risk item on a sticky note and posted it under the appropriate category. This sub-session lasted about three hours and identified more than one hundred risk items.

We also identified eleven project risks (e.g., “The number and timing of QA bug discoveries delay the release date.”) and three miscellaneous issues (e.g., “Have all previous release fixes been merged into the code base?”).

During the second sub-session, participants worked as a team to assess the likelihood and impact of each risk item. We also identified and eliminated risk items that were duplicates of other items.



To make it easy for the team to assess the likelihood of all risk items, we used the rating scale shown in table 1. We had quick inter-rater agreement on the likelihood ratings for almost all of the quality risk items using this scale.

While estimating the likelihood was fairly simple, the participants struggled with the assessment of impact. Initially, we used the scale shown in table 2. Serious debates occurred among participants about the different distinctions,

particularly between the “must fix now” and the “must fix schedule” impacts. This slowed the process considerably.

At the end of the quality risk analysis session, we had identified ninety-two non-duplicate quality risk items. Of those, the team had successfully rated the impact and likelihood for about 40 percent. We then asked one team member to assign tentative risk levels to the remaining risk items, subject to the approval of the team.

Figure 1 shows a portion of the quality risk analysis document at the end of that risk analysis session.

The team members successfully rated the remaining unrated items. In some cases, this required splitting a given item into two in order to assign an appropriate impact to each aspect of the risk. At the end of this process, we had 104 fully rated quality risk items.

## Analyzing and Refining the Quality Risk Analysis

With the likelihood and impact rated for all risk items, we calculated to the risk priority number for each item by multiplying the likelihood and impact. Since both likelihood and impact were rated on a five-point scale, risk priority numbers ranged from one to twenty-five, with one being the most risky and twenty-five the least risky.

One potential problem with quality risk analysis is a “clumping” of risk ratings. This can occur when teams consistently skew the impact of risk items by basing their ratings on worst-case outcomes or when they use a scale with poorly defined distinctions.

To check for this, we created a histogram of our risk priority numbers, as shown in figure 2.

Note that some of the “dead zones” exist because there are no two integers between 1 and 5 that when multiplied together yield 7, 11, 13, 14, 17, 18, 19, 21, 22, 23, or 24. We didn’t have a single risk item with a risk priority number of 25 because we had no very unlikely risks that we would not fix.

We did see a strong skewing toward the left, with many risk items rated with a value of 6. To check for the underlying cause, we looked at the number of risk items with each possible likelihood and impact rating, as shown in table 3.

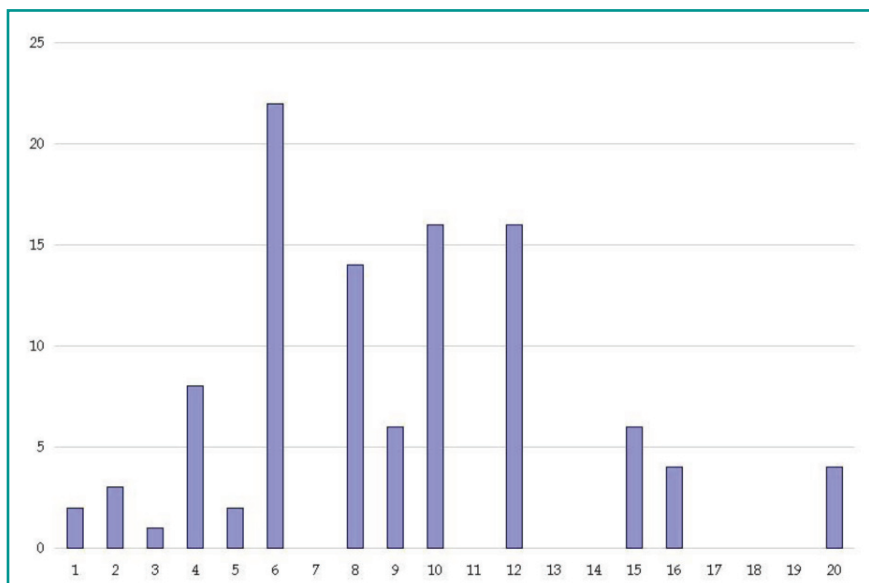


Figure 2: Risk priority number histogram after initial assessment of risk levels

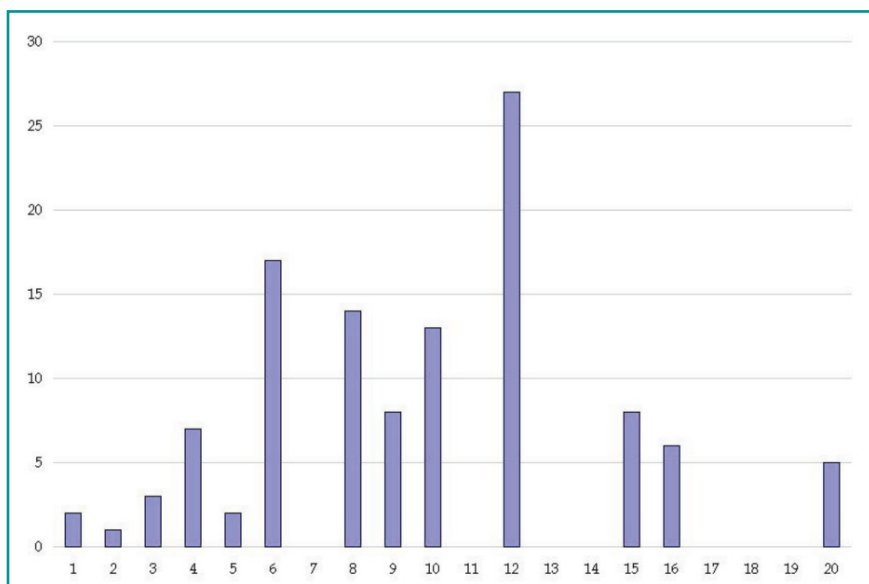


Figure 3: Risk priority number histogram with adjusted assessment of impact

Risk ID Number	Quality Risk Category	Specific Quality Risk	Likelihood	Impact	RPN	Extent of Testing	Other Action Needed	PRS/DDS Training	Total Items	Total Rated	Percent Rated
5.000	Serviceability	Problems with deploying the system, updating the system, etc.	2	3	6	Ext		PRS 2.1.3	10	10	100%
5.001		Data Com r12 doesn't support service DB	3	4	12	Ext		PRS 4.2			
5.002		Internal product tracing capabilities insufficient to resolve new function code bugs	1	3	3	Ext		PRS 2.1.6			
5.003		Report Writer has installation or packaging errors	4	2	8	Ext		DDS Vantage 2.2.3.1			
5.004		GMI will not install	3	3	9	Ext		DDS Vantage 3.2			
5.005		Can not apply GMI fixes easily	5	1	5	Ext		PRS 4.2			
5.006		Out of box implementation does not work	3	2	6	Ext		PRS 4.2			
5.007		Migration from previous releases do not work	1	1	1	Ext		PRS 4.2			
5.008		SMP/E installation does not work	4	2	8	Ext		DDS IMS 4.3			
5.009		Share Queues use or service does not work	5	3	15	Broad		PRS 4.2			
5.010		Migration from previous release is error prone									

Figure 4: Serviceability risks with testing effort and PRS/DDS mapping



Likelihood	Count	Impact	Count
1	5	1	10
2	9	2	52
3	25	3	32
4	39	4	8
5	26	5	2

**Table 3: Distribution of likelihood and impact ratings**

Impact	Rating	Comments
Must fix now	1	Top-priority, "come in on Sunday" type of issue
Must fix no workaround	2	Loss of important functionality with no workaround, so schedule for attention and resolution as quickly as possible
Must fix with workaround	3	Loss of important functionality but with a workaround, so schedule for attention as impact 1 and 2 issues are resolved
Good to fix	4	An irritant for some number of customers that will cause some concern unless resolved
Limited value to fix	5	No or limited value to fixing this problem.

**Table 4: Adjusted impact ratings to achieve more precision**

RPN Range	Extent of Testing	Comments
1 – 12	Extensive	Run a large number of tests that are both broad and deep, exercising combinations and variations of interesting conditions
13 – 16	Broad	Run a medium number of tests that exercise many different interesting conditions
17 – 20	Cursory	Run a small number of tests that sample the most interesting conditions
21 – 25	Opportunity	Leverage other tests or activities to run a test or two of an interesting condition, but only if it involves a very small investment of time and effort and only if the opportunity presents itself

**Table 5: Mapping the risk priority number to testing effort**

Looking at the left half of table 3, the likelihood ratings at first look skewed. But CA SYSVIEW is a mature, well-established product with a maintainable, solid code base and a rock-solid development team. For a newer product, such a distribution would likely be wishful thinking.

The right half of table 3, on the other hand, may be more problematic. Half of the impact ratings are 2, which means "Schedule for attention and resolution as quickly as possible."

To address this clumping, we adjusted the distinction between an impact rating of 2 and an impact rating of 3 as shown in table 4. This achieved a much better

distribution of impact, as is evident by comparing figure 3 to figure 2.

## Aligning the Testing and Quality Risks

With our initial risk analysis complete, we then set out to align testing with risk. This required us to:

- 1) Allocate testing effort based on the level of risk
- 2) Map risk items to specifications
- 3) Map risk items to test cases
- 4) Prioritize test cases based on risk levels of each risk item

One way to allocate effort is to establish a mapping between effort and risk

priority numbers. Based on discussions with the key stakeholders, we devised the mapping shown in table 5. Cross-referencing this table back to figure 3, it is evident that all risk items receive at least cursory testing.

To ensure that we could quickly update risk items based on requirements changes that might occur during the project, we mapped each risk item to the product requirements specification (PRS) and detail design specification (DDS) elements. Figure 4 shows ten quality risk items in the category of serviceability, with corresponding testing effort and mapping to the PRS and DDS documents.

## Guiding the Project Based on Risks

Once we had determined how much testing effort and what level of priority each risk item merited, we then could associate each risk with the appropriate test activities. Where a single test related to more than one risk item, the test was assigned the highest of the associated risk priority ratings. This allowed us to establish an ideal case prioritization and sequencing of tests based on risk.

The use of risk-based priority ratings to establish a testing plan was quite different from previous approaches. In the past, CA typically assigned tasks based on the expertise and availability of staff resources. Sometimes, this meant that someone with a lot of expertise might be given a large number of important tasks. The result was that this person would not perform some very important tasks until very late in the project. With our risk-based system, this did not happen. All of our high-priority tests were executed early, and all low-priority tests were executed later.

Another thing that changed was how we prioritized the bugs found during testing. Although we already had standards for determining the severity of an issue, we were now able to incorporate risk into prioritization, as well. This resulted in issues opened at a higher severity, which helped ensure that we didn't begin beta testing with any open issues that mapped to risk items with a high rating.

## Assessing Benefits and Lessons

This pilot project highlighted several key benefits of risk-based testing:



- Allocate test effort intelligently within constraints. Theoretically, testing teams would like to test every aspect of their software exhaustively. This is simply not possible. Risk-based testing enabled the team to selectively eliminate testing tasks that would not negatively affect customers or the project, so the team could focus its efforts on issues of real importance.
- Find the scary stuff first. Risk-based testing delivered a lot of value in terms of issue discovery. It enabled the team to pinpoint potentially serious problems that required remediation early in testing. This gave developers plenty of time to make changes without adversely affecting the overall project timeline.
- Respond flexibly to reductions in available test time and resources. As often happens in the real world, the team lost a person during the project. Having prioritized risks made it easier to intelligently reassign tasks to others. It

also made it easier to determine which tasks to eliminate in order to meet the target delivery date.

- Optimize quality. Ultimately, the entire point of testing is to deliver products of superior quality to customers. With risk-based testing, we ensured that the product we delivered to our customers had been thoroughly tested for issues that might significantly affect their satisfaction.

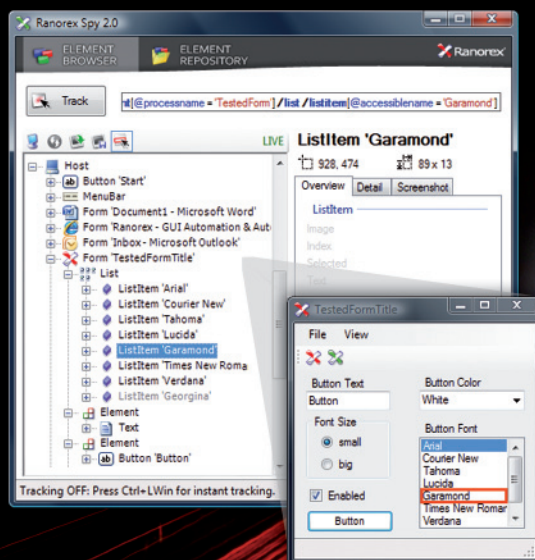
We also learned several important lessons about risk-based testing and risk analysis. One was to include business users—and, in the future, potentially even customers—in the risk analysis process. Technical staff tend to think about risk impact primarily in technical terms, such as outages or functional annoyances. But people from the business side were able to offer better insight into what kinds of issues would be most problematic for them in terms of personal productivity or business process failures. This insight is invaluable for accurately assigning risk priority numbers to testing tasks.

As software developers are called upon to deliver increasingly sophisticated and complex products within tighter and tighter resource constraints, prioritization of testing tasks will become increasingly important both for achieving product quality and for meeting project deadlines. Risk-based testing planning is therefore an essential discipline—one that testing teams should adopt as soon as they can. **{end}**

The authors would like to thank the members of the SYSVIEW team who participated in the risk analysis process for their time and diligence, especially Bob Carpenter, product line manager; Phyllis Casella, engineering project manager; Jim Cray, director software engineering; Jim Gubala, quality assurance engineer; David Jones, manager sustaining engineering; Jim Kaste, manager quality assurance; Jim Williams, principal product manager; Rob Steiskal, sr. product marketing manager.

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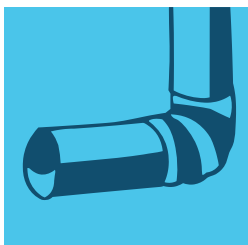
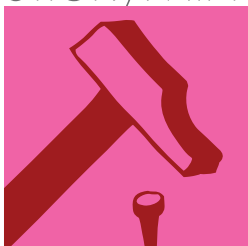
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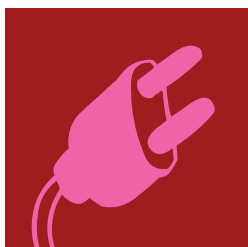
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### matrix legend





category

	Linux	Windows 95/98/98se	IBM AIX	Windows NT/2000	Compaq Alpha/UNIX	Windows XP	HP/HPUX	Windows Server 2003	Other Unix	Windows CE	Sun/SunOS/Solaris	PC-DOS/MS-DOS	Compaq/VMS	OS/390/MVS/VM	AS400	IBM mainframe	MAC/MacOS	VAX/VMS	Other
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[www.skytap.com/products/virtual-lab-overview](http://www.skytap.com/products/virtual-lab-overview)

[alex@skytap.com](mailto:alex@skytap.com)

telephone  
trial available  
training available  
address

888.SKYTAP8  
Yes  
Yes  
614 1st Ave.  
Ste. 200  
Seattle, WA 98104

**SURROUND SCM****Seapine Software**

Surround SCM, a scalable, cross-platform software configuration management solution, keeps source code and digital assets organized as it tracks change throughout your organization. Simple to configure and maintain, Surround features advanced branching, configurable workflows, user-definable fields, secure remote access, and easy integration into development and build processes. It also includes Unicode and WebDAV support, in-application triggers, email notifications, and an optional proxy server for distributed teams.

[www.seapine.com/surroundscm.html](http://www.seapine.com/surroundscm.html)

[sales@seapine.com](mailto:sales@seapine.com)

telephone  
trial available  
training available  
address

513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040

**TELELOGIC SYNERGY****IBM Rational**

Telelogic Synergy 7.0 is a global software and systems development platform that features advanced capabilities for high-end SCM and support for managing your software development and delivery environment. With Synergy 7.0, customers can control their critical software development requirements and collaborate on advanced systems delivery. It provides agility through task-based configuration management and advanced SCM capabilities with the ability to work over a heavily distributed environment over a single central server.

[www.telelogic.com/synergy](http://www.telelogic.com/synergy)

[cransom@us.ibm.com](mailto:cransom@us.ibm.com)

telephone  
trial available  
training available  
address

949.830.8022  
No  
Yes  
9401 Jeronimo Rd.  
Ste. 200  
Irvine, CA 92618





**BugHost**

BugHost

Active-X.COM

The most comprehensive and innovative BugHost service now includes all the tools you need to get your project delivered on-time: High-volume user and project licenses, requirements documents and change requests, individual and project-level task tracking, project management, custom fields, customizable discussion forum, custom reports, file system, test case management, and much more! With so many features, bug tracking, requirements, writing test cases, task tracking, scheduling, and management just got easier.

[www.bughost.com](http://www.bughost.com)

[gregory.alekel@bughost.com](mailto:gregory.alekel@bughost.com)

telephone  
trial available  
training available  
address

503.345.4349  
Yes  
No  
PO Box 3106  
Portland, OR 97208



**ProjectLocker™**  
Software Quality On Demand™

BUILDLOCKER

One Percent Software

BuildLocker is a Web-based continuous integration solution for Java and .NET projects. BuildLocker is a virtual dedicated build machine that helps teams detect and identify defects and other code integration issues faster and more effectively in the development cycle, consequently cutting down on time to market for your particular application. BuildLocker allows you to schedule an automated build to occur monthly, weekly, nightly, every four hours, and even for every commit to your source code repository.

[projectlocker.com/site/build\\_locker](http://projectlocker.com/site/build_locker)

[sales@onepercentsoftware.com](mailto:sales@onepercentsoftware.com)

telephone  
trial available  
training available  
address

866.464.3875 ext. 3  
Yes  
Yes  
100 Peachtree St. NW  
Ste. 610  
Atlanta, GA 30303

**TechExcel**

DEVTEST

TechExcel, Inc.

DevTest is a development-tracking tool that helps to ensure that quality products are developed and delivered on time and on budget by modeling business processes and aligning development with knowledge. Integrations with popular version control tools allow for items to be tracked with related source code.

[www.techexcel.com/products/devtest.html](http://www.techexcel.com/products/devtest.html)

[sales@techexcel.com](mailto:sales@techexcel.com)

telephone  
trial available  
training available  
address

800.439.7782 ext. 5  
Yes  
Yes  
3675 Mt. Diablo Blvd.  
Ste. 200  
Lafayette, CA 94549



® HP TESTDIRECTOR FOR QUALITY CENTER

HP Software & Solutions

HP TestDirector for Quality Center software offers a single, Web-based application that supports all essential aspects of test management. It provides a consistent, repeatable process for gathering requirements, planning and scheduling tests, analyzing results, and managing defects and issues. This software enables your organization to digitize specific quality processes and procedures within the larger application lifecycle. It also supports high levels of communication and collaboration among your IT team.

[www.hp.com/go/software](http://www.hp.com/go/software)

[valerie.weager@hp.com](mailto:valerie.weager@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



**ATLASSIAN  
JIRA**

JIRA

Atlassian Software Systems

JIRA is a Web-based bug-tracking application. Technical teams adopt JIRA to track and manage issues and bugs that emerge during a project. JIRA focuses on task achievement, is instantly usable, and is highly flexible to work with. JIRA has also been widely used by all teams interacting with technical teams within an organization such as finance, HR, and production. Customers include NASA, Boeing, Cisco, JP Morgan, 3M, BP, Sony, and more. To learn more about JIRA or to download a 30-day evaluation, go to [www.atlassian.com/software/jira](http://www.atlassian.com/software/jira).

[www.atlassian.com/software/jira/](http://www.atlassian.com/software/jira/)

[jon@atlassian.com](mailto:jon@atlassian.com)

telephone  
trial available  
training available  
address

1.415.701.1110  
Yes  
Yes  
Level 3, 275 George St.  
Sydney, NSW  
2000 Australia



**JPROBE**

Quest Software

JProbe is an enterprise-class Java profiler providing intelligent diagnostics on memory usage, performance, and test coverage, allowing developers to quickly pinpoint and repair the root cause of application code performance and stability problems that obstruct component and integration integrity. JProbe offers an Eclipse plug-in that provides intelligent code performance analysis and problem resolution directly within the Eclipse Java IDE.

[www.quest.com/jprobe/software-downloads.aspx](http://www.quest.com/jprobe/software-downloads.aspx)  
[info@quest.com](mailto:info@quest.com)

telephone  
trial available  
training available  
address

949.754.8000  
Yes  
Yes  
5 Polaris Way  
Aliso Viejo, CA 92656

**MINGLE**

ThoughtWorks

Mingle, the Agile project management and team collaboration tool, provides a shared workspace for your entire team. It adapts to the way project teams think and work, while supporting various flavors of Agile like XP, Scrum, and Agile Hybrid. Mingle is powerfully simple and builds upon 7+ years of ThoughtWorks' pioneering Agile delivery.

[www.thoughtworks.com/mingle](http://www.thoughtworks.com/mingle)  
[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone  
trial available  
training available  
address

512.382.5017  
Yes  
Yes  
1 Market St.  
Spear Tower  
35th Floor  
San Francisco, CA  
94105

**MKS INTEGRITY FOR TEST MANAGEMENT**

MKS Inc.

MKS Integrity helps software QA organizations manage the software application testing process. With its unique change and configuration management approach, MKS Integrity captures software test plans, triggers test case development and execution, logs test results and corresponding software defects, and directly links them to requirements, providing a closed loop of coverage and traceability across the application. Change management ensures complete testing coverage and increases agility with unique capabilities for reuse of test artifacts.

[www.mks.com/products/test](http://www.mks.com/products/test)  
[aforges@mks.com](mailto:aforges@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada

**ProjectLocker™**

Software Quality On Demand™

**PROJECTLOCKER**

One Percent Software

ProjectLocker bundles source control through Subversion with bug tracking, project management, and wiki collaboration through Trac, all hosted and securely accessible over the Internet 24/7. Subscriptions include unlimited SVN and Trac repositories, unlimited bandwidth, SSL encryption, inbound email ticketing for Trac, redundant RAID storage, hourly encrypted-at-rest backups, email support, and a 30-day money back guarantee.

[www.projectlocker.com/scenario/startup](http://www.projectlocker.com/scenario/startup)  
[sales@onepercentsoftware.com](mailto:sales@onepercentsoftware.com)

telephone  
trial available  
training available  
address

866.464.3875 ext. 3  
Yes  
Yes  
100 Peachtree St. NW  
Ste. 610  
Atlanta, GA 30303

**PURECM**

PureCM.com Ltd

PureCM is a complete Software Configuration Management solution to track changes to your source code. PureCM supports task-based development and simplifies parallel development with its powerful branching and merging support. Additional PureCM features include: cross-platform GUI client and command line interface, integration with Eclipse and Visual Studio, graphical differencing of file changes, native support for build automation and CI, proxy server to speed up distributed development, and integrated issue tracking.

[www.purecm.com](http://www.purecm.com)  
[sales@purecm.com](mailto:sales@purecm.com)

telephone  
trial available  
training available  
address

44.0.1625.660.820  
Yes  
No  
Charter House  
Charter Way  
Hurdsfield, Macclesfield  
SK10 2NG  
United Kingdom





#### RALLY COMMUNITY EDITION

##### Rally Software Development

Rally is the #1 partner for Agile success through products, coaching, and community support. With a dedicated focus on Agile, Rally helps organizations of all sizes shorten development cycles and collaborate across distributed teams and silos.

Rally's on-demand Agile lifecycle management products were honored with three-time Jolt Product Excellence Awards (the industry's Oscars) in 2006, 2007, and 2008 and support 900 customers, 20,000 projects, and 35,000 users in 50 countries. [www.rallydev.com](http://www.rallydev.com)

[www.rallydev.com/?src=stickymindsTG08](http://www.rallydev.com/?src=stickymindsTG08)

[jami.yannett@rallydev.com](mailto:jami.yannett@rallydev.com)

telephone	303.565.2800
trial available	Yes
training available	Yes
address	4001 Discovery Dr. Ste. 220 Boulder, CO 80303



#### RALLY ENTERPRISE EDITION

##### Rally Software Development

Rally is the #1 partner for Agile success through products, coaching, and community support. With a dedicated focus on Agile, Rally helps organizations of all sizes shorten development cycles and collaborate across distributed teams and silos.

Rally's on-demand Agile lifecycle management products were honored with three-time Jolt Product Excellence Awards (the industry's Oscars) in 2006, 2007, and 2008 and support 900 customers, 20,000 projects, and 35,000 users in 50 countries. [www.rallydev.com](http://www.rallydev.com)

[www.rallydev.com/?src=stickymindsTG08](http://www.rallydev.com/?src=stickymindsTG08)

[info@rallydev.com](mailto:info@rallydev.com)

telephone	303.565.2800
trial available	Yes
training available	Yes
address	4001 Discovery Dr. Ste. 220 Boulder, CO 80303



#### SILKPERFORMER

##### Borland USA

THE OPEN ALM COMPANY

Borland SilkPerformer offers a cost-effective, enterprise-class tool for software application performance and load testing, delivering automated software load, stress, and performance testing in an open and sharable model. With SilkPerformer, you can create powerful, realistic load tests for thousands of users running business scenarios across a broad range of enterprise application environments to identify bottlenecks and then apply powerful diagnostics to resolve performance issues.

[www.borland.com/us/products/silk/silkperformer/index.html](http://www.borland.com/us/products/silk/silkperformer/index.html)

[sales@borland.com](mailto:sales@borland.com)

telephone	512.340.2200
trial available	Yes
training available	Yes
address	8310 N. Capital of Texas Hwy. Building 2, Ste. 100 Austin, TX 78731



#### SMARTER QUALITY MANAGER

##### SmarteSoft Inc.

Test » Automation » » » Made Easy

Instead of having to buy separate requirements capture, bug-tracking, and testing tools, Smarter Quality Manager provides a complete quality assurance and test management solution in one package. It manages your project's requirements, test cases, bugs, and issues in one environment, with full traceability. In addition, Smarter Quality Manager provides reporting dashboards of key project health and status information, like requirements coverage, test case execution, issue summaries, and bug counts, in a simple, consolidated view.

[www.smartesoftware.com](http://www.smartesoftware.com)

[sales@smartesoftware.com](mailto:sales@smartesoftware.com)

telephone	512.782.9406
trial available	Yes
training available	Yes
address	400 West 15th St. Ste. 225 Austin, TX 78701



Software Planner

[www.softwareplanner.com](http://www.softwareplanner.com)

#### SOFTWARE PLANNER

##### Pragmatic Software Co., Inc.

Software Planner is an award-winning application lifecycle management tool that helps information technology departments manage all components of software development including managing customer requirements, project deliverables, test cases, defects, and support tickets. Coupled with collaborative tools like document sharing, team calendars, interactive dashboards, knowledge bases, and threaded discussions, teams begin communicating more effectively and begin delivering solutions quickly and with high quality.

[www.softwareplanner.com](http://www.softwareplanner.com)

[sales@pragmaticsw.com](mailto:sales@pragmaticsw.com)

telephone	800.773.7785
trial available	Yes
training available	Yes
address	383 Inverness Pkwy. Ste. 280 Englewood, CO 80112




**SQL DATA GENERATOR**

Red Gate Software Ltd.

SQL Data Generator populates MS SQL Server databases with realistic test data.

[www.red-gate.com/products/sql\\_data\\_generator/index.htm](http://www.red-gate.com/products/sql_data_generator/index.htm)[michael.francis@red-gate.com](mailto:michael.francis@red-gate.com)
 telephone  
trial available  
training available  
address

 866.733.4283 (US) or  
44.0.870.160.0037 (UK)  
Yes  
Yes  
St John's Innovation  
Centre  
Cowley Road  
Cambridge CB4 0WS  
United Kingdom


**TELELOGIC CHANGE**

IBM Rational

Telelogic Change provides a unifying change management platform that enables you to align your technology investments with your enterprise objectives by automating and integrating the evolution of changes in your organization. With its central change management platform, Telelogic Change ensures that all processes for the development and delivery of software, systems, and IT can be defined, implemented, automated, visualized, and, thus, managed independent of the actual underlying tools.

[www.telelogic.com/change](http://www.telelogic.com/change)[info@telelogic.com](mailto:info@telelogic.com)
 telephone  
trial available  
training available  
address

 949.830.8022  
No  
Yes  
9401 Jeronimo Rd.  
Ste. 200  
Irvine, CA 92618


**TESTTRACK PRO**

Seapine Software

TestTrack Pro, a scalable, cross-platform issue management solution, facilitates team collaboration across the enterprise. Simple to install, easy to use and maintain, TestTrack Pro features comprehensive workflow and process automation rules, powerful filters, escalation rules, email tracking, reports, and role-based security. It also includes extensive customizations, seamless integration with current development tools, and support for MS SQL Server, Oracle, and MySQL. Keep team members informed and on schedule with TestTrack Pro.

[www.seapine.com/ttpro.html](http://www.seapine.com/ttpro.html)[sales@seapine.com](mailto:sales@seapine.com)
 telephone  
trial available  
training available  
address

 513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040


**TESTTRACK TCM**

Seapine Software

TestTrack TCM, a scalable, cross-platform test case planning and tracking solution, manages all facets of the software testing process including test case creation, scheduling, execution, measurement, organization, and reporting. TestTrack TCM integrates with the leading issue management solution, TestTrack Pro, to automate the plan-test-fix cycle. Complete support for managing automated testing processes is also included. Manage the testing workload with Seapine TestTrack TCM.

[www.seapine.com/tttcm.html](http://www.seapine.com/tttcm.html)[sales@seapine.com](mailto:sales@seapine.com)
 telephone  
trial available  
training available  
address

 513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040


**V1: AGILE ENTERPRISE**

VersionOne

To help ensure success using Agile methodologies, enterprises worldwide have made V1: Agile Enterprise the #1 Agile project management software choice for any type of Agile methodology. V1: Agile Enterprise is an easy-to-use, centralized Agile planning and management system that is perfect for multi-team, multi-project organizations, as well as experienced Agile teams. With integrated Agile processes and improved alignment between business and IT, V1: Agile Enterprise is the most scalable, flexible, and informative tool on the market.

[www.versionone.com](http://www.versionone.com)[richard.fuller@versionone.net](mailto:richard.fuller@versionone.net)
 telephone  
trial available  
training available  
address

 678.268.3320  
Yes  
Yes  
6220 Shiloh Rd.  
Ste. 400  
Alpharetta, GA 30005





**VERSIONONE**  
Simplifying Software Delivery

V1: AGILE TEAM

VersionOne

V1: Agile Team combines VersionOne's industry-leading Agile project management expertise with the needs of smaller teams or teams new to Agile. By focusing on core Agile concepts—team collaboration, continuous planning, and incremental delivery—we've created a streamlined solution that gives teams everything they need to quickly and easily get started with Agile planning, tracking, and reporting. With V1: Agile Team, your team will stay on schedule and deliver software on time.

[www.versionone.com](http://www.versionone.com)

[denise.grey@versionone.com](mailto:denise.grey@versionone.com)

telephone  
trial available  
training available  
address

678.268.3320  
Yes  
Yes  
6220 Shiloh Rd.  
Ste. 400  
Alpharetta, GA 30005



® HP FUNCTIONAL TESTING

HP Software & Solutions

HP Functional Testing software delivers a complete automated solution for functional, graphical user interface, and regression testing that helps you reduce the risks of application failures. This software enables your entire team to correct functionality across all environments, data sets, and business processes. You can also create sophisticated test suites with minimal training and easily perform regression testing in constantly changing environments.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



® HP QUICKTEST PROFESSIONAL

HP Software & Solutions

The key features of HP QuickTest Professional software allow you to create sophisticated test suites with minimal training; improve collaboration between workgroups with shared function libraries, object management, and flexible asset storage; collapse test documentation and test creation to a single step; and fix defects faster by fully documenting and replicating defects for developers.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014

**Klocwork**

KLOCWORK DEVELOPER FOR JAVA

Klocwork Inc.

Klocwork Developer for Java (KDJ) takes Klocwork's proven, enterprise-ready, static analysis technology and packages it for the individual Java developer. KDJ provides automated detection of more than 200 security vulnerabilities and quality defects without the need for test cases. Whether the goal is to catch critical code defects before code check in or to ensure code is free of security vulnerabilities, KDJ helps developers produce code that meets corporate objectives for quality and security.

[www.klocwork.com/products/developerJava.asp](http://www.klocwork.com/products/developerJava.asp)

[jim.bush@klocwork.com](mailto:jim.bush@klocwork.com)

telephone  
trial available  
training available  
address

781.685.2910  
Yes  
No  
8 New England  
Executive Park  
Ste. 180  
Burlington, MA 01803



## Klocwork<sup>®</sup> KLOCWORK INSIGHT

Klocwork Inc.

Klocwork Insight provides powerful, collaborative analysis of C/C++ and Java code. With Klocwork Insight, developers, development organizations, and security specialists can quickly and accurately identify critical security vulnerabilities, quality defects, and architectural issues in their mission-critical code. By eliminating code defects early in the development process, Klocwork Insight helps organizations accelerate development, reduce costs, create a better implementation process, and deliver cleaner, better code.

[www.klocwork.com/products/insight.asp](http://www.klocwork.com/products/insight.asp)
[tom.millea@klocwork.com](mailto:tom.millea@klocwork.com)

 telephone  
trial available  
training available  
address

 781.685.2910  
Yes  
Yes  
8 New England  
Executive Park  
Ste. 180  
Burlington, MA 01803

## TechSmith MORAE

MORAE

TechSmith Corporation

Morae is the premier software for deeply understanding customer experiences—and sharing those insights clearly and powerfully.

Use Morae to record exactly what customers do and say, discover patterns in the data, key in on significant moments, and build a compelling case for how to improve the customer experience. From usability testing to focus groups and beyond, Morae helps you transform designs and marketing to make things people love.

[www.techsmith.com/morae.asp](http://www.techsmith.com/morae.asp)
[www.techsmith.com/sales](http://www.techsmith.com/sales)

 telephone  
trial available  
training available  
address

 517.381.2300  
Yes  
Yes  
2405 Woodlake Dr.  
Okemos, MI 48864


TARGETPROCESS

TargetProcess, Inc.

Founded in 2004, TargetProcess had a vision to pioneer an easy-to-deploy but comprehensive solution that reduces the complexity of software

project management. TargetProcess assists software development teams in managing agile development processes, including Scrum, XP, and other agile processes. The company's mission is to simplify the planning, tracking, and quality assurance required by shortened development cycles in agile process development.

[www.targetprocess.com](http://www.targetprocess.com)
[andrey@targetprocess.com](mailto:andrey@targetprocess.com)

 telephone  
trial available  
training available  
address

 877.718.2617 ext.704  
Yes  
Yes  
PO Box 1845  
Amherst, NY 14228

## Automated Build Studio

simplify your deployment

AUTOMATED BUILD STUDIO

AutomatedQA

Automated Build Studio is a release management system that provides an easy and visual way to automate the software development build and deployment process. Users easily create visual macros by dragging and dropping pre-built operations. More than 500 built-in operations are available in a variety of categories.

[www.automatedqa.com/products/abs.asp](http://www.automatedqa.com/products/abs.asp)
[sales@automatedqa.com](mailto:sales@automatedqa.com)

 telephone  
trial available  
training available  
address

 978.236.7900  
Yes  
Yes  
100 Cummings Center  
Ste. 420B  
Beverly, MA 01915





**ProjectLocker™**  
Software Quality On Demand™

BUILDLOCKER

One Percent Software

BuildLocker is a Web-based continuous integration solution for Java and .NET projects. BuildLocker is a virtual dedicated build machine that helps teams detect and identify defects and other code integration issues faster and more effectively in the development cycle, consequently cutting down on time to market for your particular application. BuildLocker allows you to schedule an automated build to occur monthly, weekly, nightly, every four hours, and even for every commit to your source code repository.

[projectlocker.com/site/build\\_locker](http://projectlocker.com/site/build_locker)

[sales@onepercentsoftware.com](mailto:sales@onepercentsoftware.com)

telephone  
trial available  
training available  
address

866.464.3875 ext. 3  
Yes  
Yes  
100 Peachtree St. NW  
Ste. 610  
Atlanta, GA 30303



CODE COLLABORATOR

Smart Bear Inc.

Code Collaborator enables peer review of source code changes before or after files are checked into version control. Automate audit trails, enforce workflow, and generate reports. Works equally well for on-site and off-shore inspections.

Integrates with SCM, issue-tracking, reporting, and other external systems.

[codecollaborator.com](http://codecollaborator.com)

[info@codecollaborator.com](mailto:info@codecollaborator.com)

telephone  
trial available  
training available  
address

512.257.1569  
Yes  
Yes  
12885 Research Blvd.  
Ste. 210  
Austin, TX 78750



CODEPRO ANALYTIX

Instantiations, Inc.

CodePro AnalytiX is the premier Java software testing tool for Eclipse developers who are concerned about improving the quality of their source code. AnalytiX seamlessly integrates into the Eclipse environment. With its powerful features, AnalytiX assists developers with creating high quality code, including static code analysis (with extensive OWASP-based security vulnerability audit rules), powerful reporting and metrics, automated JUnit test generation and JUnit test editor, code coverage analysis, integrated team collaboration, and more.

[www.instantiations.com/codepro/analytix/about.html](http://www.instantiations.com/codepro/analytix/about.html)

[sales@instantiations.com](mailto:sales@instantiations.com)

telephone  
trial available  
training available  
address

503.598.4900  
Yes  
Yes  
18101 SW Boones  
Ferry Rd.  
Ste. 200  
Portland, OR 97224



CODEPRO PROFILER

Instantiations, Inc.

CodePro Profiler is an Eclipse-based software development product that enables Java developers to easily find performance problems early in the development cycle and automatically locate performance bottlenecks, memory leaks, and threading issues. CodePro Profiler offers highly accurate profiling with nearly zero overhead and on-demand profiling with powerful telemetry reporting. CodePro Profiler seamlessly integrates into the Eclipse development process and includes extensive best practices documentation and optimization guides.

[www.instantiations.com/codepro/profiler](http://www.instantiations.com/codepro/profiler)

[sales@instantiations.com](mailto:sales@instantiations.com)

telephone  
trial available  
training available  
address

503.598.4900  
Yes  
Yes  
18101 SW Boones  
Ferry Rd.  
Ste. 200  
Portland, OR 97224



CONTINUOUS INTEGRATION

CRUISE

ThoughtWorks

Cruise is a continuous integration and release management system that enables software teams to go live with new, tested features quickly and repeatably. By lowering the effort and risk associated with releasing complex applications, Cruise leaves your team free to focus on the stuff that really matters—delivering value through innovation. Cruise draws from the extensive continuous integration experience of ThoughtWorks, the creators of the original CruiseControl.

[www.thoughtworks.com/studios](http://www.thoughtworks.com/studios)

[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone  
trial available  
training available  
address

512.382.5017  
Yes  
Yes  
1 Market St.  
Spear Tower  
35th Floor  
San Francisco, CA  
94105



**DSTAR**

Mosaic, Inc.

DSTAR is an ODBC-compliant Quality Center add-on that manages the test data required for manual and automated testing. It tracks and maintains test data assignments for reusable tests in Quality Center. DSTAR controls and maintains data extracted from databases or created externally. Through integration with Quality Center, DSTAR allows test data assignments to be maintained as late as test execution time and then provides the data for test execution. DSTAR includes an integrated test automation framework and management reporting.

[www.mosaicinc.com](http://www.mosaicinc.com)  
[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

telephone  
trial available  
training available  
address

312.819.2220  
No  
Yes  
205 N. Michigan Ave.  
Ste. 2211  
Chicago, IL 60601

**ELECTRICCOMMANDER**

ElectricCloud Inc.

ElectricCommander is an enterprise-class automation platform for the entire build-test-deploy process. Unlike traditional continuous integration servers, ElectricCommander has an extensible architecture that can scale to support multiple teams, working in multiple locations, and developing for multiple platforms—with a single system. It is simple to roll out, provides traceability for compliance efforts, and supports continuous integration and agile development techniques.

[www.electric-cloud.com/products/electriccommander.php](http://www.electric-cloud.com/products/electriccommander.php)  
[sales@electric-cloud.com](mailto:sales@electric-cloud.com)

telephone  
trial available  
training available  
address

408.419.4300  
Yes  
Yes  
676 West Maude Ave.  
Sunnyvale, CA 94085

**eVALID**

Software Research, Inc.

The eValid suite supports all your automation requirements for the quality, reliability, and performance of your Web-based applications: GUI interaction, test data creation, functional and regression testing, load generation, and monitoring capability of your server. One system does it all. It is easy to use and is cost effective. Tests generated for regression can be reused for server loading or monitoring—all with easy point and click. eValid is optimized for testing every kind of live Web application—e-commerce, Ajax, and Web 2.0.

[www.e-valid.com/quick.summary.html](http://www.e-valid.com/quick.summary.html)  
[ritabral@soft.com](mailto:ritabral@soft.com)

telephone  
trial available  
training available  
address

415.861.2800  
Yes  
Yes  
1663 Mission St.  
Ste. 400  
San Francisco, CA  
94103

**FISH EYE**

Atlassian Software Systems

FishEye opens up your Subversion, CVS, or Perforce source code repository to help development teams keep tabs on what's going on. Track code changes by subscribing to personalized RSS or email commit feeds. Browse your changelog and source by any combination of directory, author, branch, or tag. Write precise queries with simple EyeQL query language and run them via the public API. Chart line count by author, directory, and file type. Get file annotations and branch diagrams. Integrate easily with JIRA and other development tools.

[www.atlassian.com/software/fisheye](http://www.atlassian.com/software/fisheye)  
[sales@atlassian.com](mailto:sales@atlassian.com)

telephone  
trial available  
training available  
address

415.701.1110 (US)  
Yes  
Yes  
Level 3, 275 George St.  
Sydney, NSW  
2000 Australia

**HP CENTER MANAGEMENT FOR QUALITY CENTER**

HP Software &amp; Solutions

HP Center Management for Quality Center software helps your organization manage HP Quality Center software as a shared Center of Excellence. The combination of proven best practices and HP Project and Portfolio Management software enables your organization to conquer your quality management challenges. You can manage application project lifecycle and quality assurance test phases, resources, and skill sets; automate project and resource management processes; and improve center administration and management.

[www.hp.com/go/software](http://www.hp.com/go/software)  
[vw@hp.com](mailto:vw@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014





® HP DIAGNOSTICS

HP Software & Solutions

HP Diagnostics helps you improve application availability and performance in pre-production and production environments. You can drill down from the end-user into application components and cross-platform service calls to resolve the toughest problems. This includes slow services, methods, SQL, out-of-memory errors, threading problems, and more.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



® HP LOADRUNNER

HP Software & Solutions

HP LoadRunner can help you prevent costly performance problems in production by detecting bottlenecks before a new system or upgrade is deployed. This software enables you to measure end-to-end performance, diagnose application and system bottlenecks, and tune for better performance—all from a single point of control. This helps reduce the costs and time required to test and deploy new applications and systems into your production environment.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



® HP QUICKTEST PROFESSIONAL

HP Software & Solutions

The key features of HP QuickTest Professional software allow you to create sophisticated test suites with minimal training; improve collaboration between workgroups with shared function libraries, object management, and flexible asset storage; collapse test documentation and test creation to a single step; and fix defects faster by fully documenting and replicating defects for developers.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



® HP SERVICE TEST

HP Software & Solutions

HP Service Test software is a SOA testing solution that simplifies and accelerates the automated functional testing of SOA services. It reduces the time required to test SOA services and helps ensure that these services meet your business requirements prior to deployment. HP Service Test software enables your organization to simplify your testing processes and minimize the need for scripting by automating capabilities.

[www.hp.com/go/software](http://www.hp.com/go/software)

[vw@hp.com](mailto:vw@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



JAMA CONTOUR

Jama Software

As the #1 Web-based requirements management software, Contour provides a collaborative, easy-to-use solution to help companies build great software products. With Contour, you don't have to change your process, and you achieve immediate benefits: SPEED—Contour cuts product planning and requirements management cycles in half, ALIGNMENT—Contour keeps your entire team in sync throughout the product development process, QUALITY—Contour helps you reduce costly errors and ensure high quality releases on time.

[www.jamasoftware.com](http://www.jamasoftware.com)

[ewinquist@jamasoftware.com](mailto:ewinquist@jamasoftware.com)

telephone  
trial available  
training available  
address

503.892.2731  
Yes  
Yes  
2828 SW Corbett Ave.  
Ste. 119  
Portland, OR 97201



**JPROBE**

Quest Software

JProbe is an enterprise-class Java profiler providing intelligent diagnostics on memory usage, performance, and test coverage, allowing developers to quickly pinpoint and repair the root cause of application code performance and stability problems that obstruct component and integration integrity. JProbe offers an Eclipse plug-in that provides intelligent code performance analysis and problem resolution directly within the Eclipse Java IDE.

[www.quest.com/jprobe/software-downloads.aspx](http://www.quest.com/jprobe/software-downloads.aspx)  
[info@quest.com](mailto:info@quest.com)

telephone  
trial available  
training available  
address

949.754.8000  
Yes  
Yes  
5 Polaris Way  
Aliso Viejo, CA 92656

## Klocwork<sup>®</sup>

KLOCWORK DEVELOPER FOR JAVA

Klocwork Inc.

Klocwork Developer for Java (KDJ) takes Klocwork's proven, enterprise-ready, static analysis technology and packages it for the individual Java developer. KDJ provides automated detection of more than 200 security vulnerabilities and quality defects without the need for test cases. Whether the goal is to catch critical code defects before code check in or to ensure code is free of security vulnerabilities, KDJ helps developers produce code that meets corporate objectives for quality and security.

[www.klocwork.com/products/developerJava.asp](http://www.klocwork.com/products/developerJava.asp)  
[jim.bush@klocwork.com](mailto:jim.bush@klocwork.com)

telephone  
trial available  
training available  
address

781.685.2910  
Yes  
No  
8 New England  
Executive Park  
Ste. 180  
Burlington, MA 01803

## Klocwork<sup>®</sup>

KLOCWORK INSIGHT

Klocwork Inc.

Klocwork Insight provides powerful, collaborative analysis of C/C++ and Java code. With Klocwork Insight, developers, development organizations, and security specialists can quickly and accurately identify critical security vulnerabilities, quality defects, and architectural issues in their mission-critical code. By eliminating code defects early in the development process, Klocwork Insight helps organizations accelerate development, reduce costs, create a better implementation process, and deliver cleaner, better code.

[www.klocwork.com/products/insight.asp](http://www.klocwork.com/products/insight.asp)  
[tom.millea@klocwork.com](mailto:tom.millea@klocwork.com)

telephone  
trial available  
training available  
address

781.685.2910  
Yes  
Yes  
8 New England  
Executive Park  
Ste. 180  
Burlington, MA 01803

**LDRA TESTBED**

LDRA Ltd.

LDRA Testbed is a static analysis and code coverage tool for C, C++, Ada83/Ada95, and Assembler (Intel, Freescale, Texas Instruments).

Static analysis features include code visualization, programming standards checking, and complexity metrics. Code coverage is available for different coverage levels including MC/DC level A for the D0-178B standard, regression testing, and is available for any host/target environment.

[www.ldra.com/testbed.asp](http://www.ldra.com/testbed.asp)  
[jonathan.kelly@ldra.com](mailto:jonathan.kelly@ldra.com)

telephone  
trial available  
training available  
address

44.0.151.649.9300  
Yes  
Yes  
Portside, Monks Ferry  
Wirral, CH41 5LH  
United Kingdom

## iTKO<sup>™</sup> LISA<sup>™</sup>

LISA SOA TESTING, VALIDATION &amp; VIRTUALIZATION SUITE

iTKO, Inc.

iTKO's LISA SOA Testing, Validation &amp; Virtualization suite pro-

vides a complete, collaborative, and continuous environment across every phase of software development and deployment. LISA's no-code environment automates SOA unit, functional, regression, and load test creation and execution—from rich Web apps to middle-tier technologies such as Web services, ESB messaging, databases, mainframes, and more. LISA's extensibility and virtualization of SOA behaviors eliminate dependencies in the lifecycle while increasing team agility.

[www.itko.com/site/products/index.jsp](http://www.itko.com/site/products/index.jsp)  
[info@itko.com](mailto:info@itko.com)

telephone  
trial available  
training available  
address

877.BUY.ITKO  
Yes  
Yes  
1505 LBJ Fwy.  
Ste. 250  
Dallas, TX 75234





#### McCABE CM—TRUECHANGE

McCabe Software

McCabe CM is the only Software Change and Configuration Management solution to utilize "Integrated Difference" technology, providing an intuitive and logical approach to managing software versioning and changes. The drag-and-drop stream view allows you to securely apply change across the application lifecycle in seconds instead of days. McCabe CM helps you manage your change process, speed application delivery, and ultimately improve the quality of your software—all at a lower total cost of ownership.

[www.mccabe.com/cm.htm](http://www.mccabe.com/cm.htm)

[sales@mccabe.com](mailto:sales@mccabe.com)

telephone  
trial available  
training available  
address

401.572.3100  
Yes  
Yes  
41 Sharpe Dr.  
Cranston, RI 02920

#### MessageMagic

MESSAGEMAGIC

#### XML-Simulator

Elvior

MessageMagic is ideal for incremental software development. It supports black box testing of an individual task or process, subsystems integration tests, and SW/HW integration tests. MessageMagic contains text-based TTCN-3 editor, compiler, and debugger. It supports TTCN-3 TCI and TRI interfaces. The user-friendly GUI allows users to develop, execute, and analyze test suites efficiently. MessageMagic simplifies and accelerates product development—with all the benefits that derive from shorter development cycles.

[messagemagic.elvior.ee](mailto:messagemagic.elvior.ee)

[andres.kull@elvior.ee](mailto:andres.kull@elvior.ee)

telephone  
trial available  
training available  
address

372.667.1737  
Yes  
Yes  
Mustamae tee 44  
Tallinn, Harjumaa  
10621 Estonia



MKS INTEGRITY

MKS Inc.

MKS Integrity is an enterprise application lifecycle management platform that coordinates and manages all activities and artifacts associated with software development including requirements management, software configuration and change management, test management, defect management, deployment management, and portfolio management for applications. MKS's unified platform provides enterprise scalability and multi-platform capability to deliver higher team productivity, visibility, and compliance for engineering and IT organizations.

[www.mks.com/solutions](http://www.mks.com/solutions)

[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



MKS INTEGRITY FOR REQUIREMENTS MANAGEMENT

MKS Inc.

MKS Integrity for Requirements Management enables organizations to address the primary causes of software project failures. Built on the foundation of a single ALM platform, MKS Integrity enables organizations to capture and validate software requirements, link them to downstream development and testing activities, and manage their completion through a unified process across the lifecycle. Capabilities for requirements change management and reuse enable the business to improve agility and visibility and reduce software project risk.

[www.mks.com/products/requirements](http://www.mks.com/products/requirements)

[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



MKS INTEGRITY FOR SOFTWARE CHANGE AND CONFIGURATION MANAGEMENT

MKS Inc.

MKS Integrity for SCCM is an enterprise platform that enables organizations to more effectively develop and deliver software in a collaborative manner across geographic locations. MKS Integrity allows a team to make well-informed decisions by providing visibility across all activities and artifacts in the application development lifecycle, combined with process-driven change and configuration management capabilities. Full lifecycle traceability and explicit support for software reuse improve agility and reduce time to market.

[www.mks.com/products/source](http://www.mks.com/products/source)

[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



# MKS

## MKS INTEGRITY FOR TEST MANAGEMENT

MKS Inc.

MKS Integrity helps software QA organizations manage the software application testing process. With its unique change and configuration management approach, MKS Integrity captures software test plans, triggers test case development and execution, logs test results and corresponding software defects, and directly links them to requirements, providing a closed loop of coverage and traceability across the application. Change management ensures complete testing coverage and increases agility with unique capabilities for reuse of test artifacts.

[www.mks.com/products/test](http://www.mks.com/products/test)

[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



**OpenMake**  
Software

## OPENMAKE MEISTER

OpenMake Software

By managing more build engines—such as MSBuild and Ant—OpenMake Meister automates 100% of the build to release process. Unlike any of its competitors, Meister offers reusable Build Services that eliminates costly, redundant, and error-prone manual scripting related to both ALM and build activities. Meister provides the highest level of integration with development tools and build engines. Workflow tools offer only 10% automation—Meister's Build Services does the other 90%, too.

[www.openmakesoftware.com](http://www.openmakesoftware.com)

[tracy.ragan@openmakesoftware.com](mailto:tracy.ragan@openmakesoftware.com)

telephone  
trial available  
training available  
address

312.440.9545  
Yes  
Yes  
213 W. Institute Pl.  
#404  
Chicago, IL 60610

# ORACLE®

## ORACLE FUNCTIONAL TESTING FOR WEB APPLICATIONS

Oracle

Oracle Functional Testing for Web Applications is an easy-to-use functional and regression testing tool that allows you to automate your testing processes. Oracle Functional Testing for Web Applications is a component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)

[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

telephone  
trial available  
training available  
address

800.ORACLE1  
Yes  
Yes  
500 Oracle Pkwy.  
Redwood Shores, CA  
94065

# ORACLE®

## ORACLE LOAD TESTING FOR WEB APPLICATIONS

Oracle

Oracle Load Testing for Web Applications not only stresses your application to simulate the impact of end-user workloads but it also enables rigorous validation that protocol-based legacy client server testing tools cannot provide. Oracle Load Testing for Web Applications is a component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)

[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

telephone  
trial available  
training available  
address

800.ORACLE1  
Yes  
Yes  
500 Oracle Pkwy.  
Redwood Shores, CA  
94065

# ORACLE®

## ORACLE TEST MANAGER FOR WEB APPLICATIONS

Oracle

Oracle Test Manager for Web Applications is a flexible, easy-to-use test process management solution on which you can build and organize your entire testing process. Oracle Test Manager for Web Applications is a key component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)

[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

telephone  
trial available  
training available  
address

800.ORACLE1  
Yes  
Yes  
500 Oracle Pkwy.  
Redwood Shores, CA  
94065





#### PARASOFT JTEST

Parasoft Corporation

Parasoft Jtest is a comprehensive Java testing product for development teams building Java EE, SOA, Web, and other Java applications. Whether a team is trying to build quality into new code or extend a legacy code base without breaking existing functionality, Jtest provides them a practical way to ensure that their Java code works as expected. It empowers them to modify their code quickly and with confidence, resulting in optimization of development resources and control of development schedules and costs.

[www.parasoft.com/jtest](http://www.parasoft.com/jtest)  
[info@parasoft.com](mailto:info@parasoft.com)

telephone	888.305.0041
trial available	Yes
training available	Yes
address	101 E. Huntington Dr. 2nd Floor Monrovia, CA 91016



#### PARASOFT SOATEST

Parasoft Corporation

Parasoft SOAtest is a comprehensive, collaborative test and analysis tool suite designed specifically for test and validation of service-oriented architectures (SOA). Parasoft SOAtest streamlines the process of rapidly constructing robust regression suites. It features the following major benefits: delivers a "quality" process not solely dependent on QA, makes SOA quality assets valuable to the entire organization, drives SOA consistency, rapidly generates and manages robust regression suites, saves time, and ensures project success.

[parasoft.com/soatest](http://parasoft.com/soatest)  
[info@parasoft.com](mailto:info@parasoft.com)

telephone	888.305.0041
trial available	Yes
training available	Yes
address	101 E. Huntington Dr. 2nd Floor Monrovia, CA 91016



**ProjectLocker™**  
Software Quality On Demand™

#### PROJECTLOCKER

One Percent Software

ProjectLocker bundles source control through Subversion with bug tracking, project management, and wiki collaboration through Trac, all hosted and securely accessible over the Internet 24/7. Subscriptions include unlimited SVN and Trac repositories, unlimited bandwidth, SSL encryption, inbound email ticketing for Trac, redundant RAID storage, hourly encrypted-at-rest backups, email support, and a 30-day money back guarantee.

[www.projectlocker.com/scenario/startup](http://www.projectlocker.com/scenario/startup)  
[sales@onepercentsoftware.com](mailto:sales@onepercentsoftware.com)

telephone	866.464.3875 ext. 3
trial available	Yes
training available	Yes
address	100 Peachtree St. NW Ste. 610 Atlanta, GA 30303



**PureCM**

#### PURECM

PureCM.com Ltd

PureCM is a complete Software Configuration Management solution to track changes to your source code. PureCM supports task-based development and simplifies parallel development with its powerful branching and merging support. Additional PureCM features include: cross-platform GUI client and command line interface, integration with Eclipse and Visual Studio, graphical differencing of file changes, native support for build automation and CI, proxy server to speed up distributed development, and integrated issue tracking.

[www.purecm.com](http://www.purecm.com)  
[sales@purecm.com](mailto:sales@purecm.com)

telephone	44.0.1625.660.820
trial available	Yes
training available	No
address	Charter House Charter Way Hurdsfield, Macclesfield SK10 2NG United Kingdom



**Seapine Software™**

#### QA WIZARD PRO

Seapine Software

QA Wizard Pro automates the functional and regression testing of Web and Windows applications. Featuring a next-generation scripting language and an easy-to-use Grid View, QA Wizard Pro includes advanced object searching, a global application repository, data-driven testing support, validation checkpoints, and built-in debugging. It also includes batch file support, a real-time status tool, and remote execution support. Focus on what you want to test—instead of how to test it—with Seapine QA Wizard Pro.

[www.seapine.com/qawizard.html](http://www.seapine.com/qawizard.html)  
[sales@seapine.com](mailto:sales@seapine.com)

telephone	513.754.1655
trial available	Yes
training available	Yes
address	5412 Courseview Dr. Ste. 200 Mason, OH 45040



**RANOREX GUI TEST AUTOMATION FRAMEWORK**

Ranorex

Ranorex is a cost-effective and comprehensive GUI test automation framework for developers and testers regardless of their programming or scripting experience. Ranorex supports testing of .NET, VB, Adobe Flash/Flex, Delphi, Java, and Web applications, using common languages such as C#, VB.NET, or Python. In addition, an object-based Capture/Replay editor enhances the generation of reusable test automation recordings.

[www.ranorex.com](http://www.ranorex.com)  
[info@ranorex.com](mailto:info@ranorex.com)

telephone  
trial available  
training available  
address

43.316.28.13.28  
Yes  
Yes  
Strassgangerstr. 289  
Graz, Steiermark  
8054 Austria

**SILKTEST**

Borland USA

THE OPEN ALM COMPANY

Borland SilkTest is the proven choice of QA professionals for powerful functional and regression test automation. Intuitive GUI record-and-play capabilities—coupled with a stable, easy-to-use testing language—enable you to build functional and regression tests that do not break with minor changes to the application, a problem that makes most functional testing tools too costly to implement. SilkTest delivers time-tested stability and support for major enterprise environments in a cost-effective package.

[www.borland.com/us/products/silk/silktest/index.html](http://www.borland.com/us/products/silk/silktest/index.html)  
[sales@borland.com](mailto:sales@borland.com)

telephone  
trial available  
training available  
address

512.340.2200  
Yes  
Yes  
8310 N. Capital of  
Texas Hwy.  
Building 2, Ste.100  
Austin, TX 78731

**SQL DATA GENERATOR**

Red Gate Software Ltd.

ingeniously simple tools

SQL Data Generator populates MS SQL Server databases with realistic test data.

[www.red-gate.com/products/sql\\_data\\_generator/index.htm](http://www.red-gate.com/products/sql_data_generator/index.htm)  
[michael.francis@red-gate.com](mailto:michael.francis@red-gate.com)

telephone  
trial available  
training available  
address

866.733.4283 (US) or  
44.0.870.160.0037 (UK)  
Yes  
Yes  
St John's Innovation  
Centre  
Cowley Road  
Cambridge CB4 0WS  
United Kingdom

**TBRUN**

LDRA Ltd.

TBrun is LDRA's automated unit testing tool. The functionality within TBrun includes a GUI interface, which automates the production of test data vectors (by using TBeXtreme) while test harness and stub generation is completely automatic. It also produces the test documentation and other reports. Automatic generation of test data vectors can be provided by TBeXtreme for robustness, test scenarios, and support of black box, white box, and object box testing.

[www.ldra.com/tbrun.asp](http://www.ldra.com/tbrun.asp)  
[info@ldra.com](mailto:info@ldra.com)

telephone  
trial available  
training available  
address

44.0.151.649.9300  
Yes  
Yes  
Portside, Monks Ferry  
Wirral CH41 5LH  
United Kingdom

**TELELOGIC SYNERGY**

IBM Rational

Telelogic Synergy 7.0 is a global software and systems development platform that features advanced capabilities for high-end SCM and support for managing your software development and delivery environment. With Synergy 7.0, customers can control their critical software development requirements and collaborate on advanced systems delivery. It provides agility through task-based configuration management and advanced SCM capabilities with the ability to work over a heavily distributed environment over a single central server.

[www.telelogic.com/synergy](http://www.telelogic.com/synergy)  
[info@us.ibm.com](mailto:info@us.ibm.com)

telephone  
trial available  
training available  
address

949.830.8022  
No  
Yes  
9401 Jeronimo Rd.  
Ste. 200  
Irvine, CA 92618





#### TELELOGIC FOCAL POINT

##### IBM Rational

Telelogic Focal Point offers the only solution with the unique perspective of improving product value and increasing agility from idea conception through the product lifecycle with a continual focus on customer needs. Focal Point reduces the chaos of managing information in emails, documents, and spreadsheets by providing a collaborative environment for centralizing product information shared by product management, engineering, marketing, and other stakeholders.

[www.telelogic.com/products/focalpoint/](http://www.telelogic.com/products/focalpoint/)  
[info@telelogic.com](mailto:info@telelogic.com)

telephone	877.275.4777
trial available	Yes
training available	Yes
address	9401 Jeronimo Rd. Ste. 200 Irvine, CA 92618



#### TESTPARTNER

##### Compuware Corporation

Compuware TestPartner is an automated testing tool that speeds functional testing of complex applications developed with a range of distributed technologies. It features a visual, storyboard-oriented approach to capturing business processes that empowers application users to collaborate with quality experts and accomplish more testing in the time available.

[www.compuware.com/testpartner](http://www.compuware.com/testpartner)  
[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

telephone	800.COMPUWARE
trial available	Yes
training available	Yes
address	One Campus Martius Detroit, MI 48226



#### Seapine Software™

#### TESTTRACK TCM

##### Seapine Software

TestTrack TCM, a scalable, cross-platform test case planning and tracking solution, manages all facets of the software testing process including test case creation, scheduling, execution, measurement, organization, and reporting. TestTrack TCM integrates with the leading issue management solution, TestTrack Pro, to automate the plan-test-fix cycle. Complete support for managing automated testing processes is also included. Manage the testing workload with Seapine TestTrack TCM.

[www.seapine.com/ttcm.html](http://www.seapine.com/ttcm.html)  
[sales@seapine.com](mailto:sales@seapine.com)

telephone	513.754.1655
trial available	Yes
training available	Yes
address	5412 Courseview Dr. Ste. 200 Mason, OH 45040



#### TWIST

##### ThoughtWorks

Twist is a next-generation collaborative functional testing platform for software teams. It provides a rich environment for authoring, executing, and maintaining tests. Twist is designed to be used by subject matter experts, QA professionals, and developers, making everyone on a team jointly responsible for software quality. Twist leverages the testing expertise of ThoughtWorks, the creators of the popular Web testing engine Selenium.

[www.thoughtworks.com/twist](http://www.thoughtworks.com/twist)  
[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone	512.382.5017
trial available	Yes
training available	Yes
address	1 Market Street Spear Tower 35th Floor San Francisco, CA 94105



#### VECTORCAST

##### Vector Software, Inc.

The VectorCAST products automate and manage the complex tasks associated with testing safety-critical applications. Our customers are developing applications in the avionics, military, medical device, automotive, industrial controls, and railway industries. Applications that must be tested to strict safety standards include: DO-178B, ED-12B, IEC61508, MISRA, FDA/IEC62304, and CENELEC.

[www.vectorcast.com](http://www.vectorcast.com)  
[amn@vectorcast.com](mailto:amn@vectorcast.com)

telephone	401.295.5855
trial available	Yes
training available	Yes
address	1130 Ten Rod Rd. Ste. F-207 North Kingstown, RI 02852



**VMLOGIX LABMANAGER**

VMLogix Inc.

VMLogix LabManager helps IT organizations empower development, test, and support teams to build, snapshot, share, and deploy production-like environments on-demand across Citrix, Microsoft, and VMware virtualization platforms. Using advanced automation capabilities, advanced team management, and seamless integration with leading build and test management solutions from HP and IBM, companies can dramatically reduce the manual effort, time, and IT resources required to develop and maintain higher quality software applications.

[www.vmlogix.com/Products/VMLogix-LabManager/](http://www.vmlogix.com/Products/VMLogix-LabManager/)
[sales@vmlogix.com](mailto:sales@vmlogix.com)

 telephone  
trial available  
training available  
address

 650.451.5555  
Yes  
Yes  
228 Hamilton Ave.  
3rd Floor  
Palo Alto, CA 94301
**WEB PERFORMANCE LOAD TESTER**

Web Performance Inc.

Web Performance Load Tester is Web load testing and Web stress testing software and tools targeted at Web sites that use standard technologies such as Web forms, J2EE, ASP, .NET, PHP, ColdFusion, Java, etc. Its automatic analysis can tell you how many users your Web site is capable of handling at one time using your own unique performance criteria. Web Performance Load Tester includes all of the advanced features needed to test the latest Ajax and SOAP-based architectures such as automatic dynamic variable replacement, all types of authentication, IP-spoofing, etc.

[www.webperformanceinc.com](http://www.webperformanceinc.com)
[czei@webperformanceinc.com](mailto:czei@webperformanceinc.com)

 telephone  
trial available  
training available  
address

 919.845.7601  
Yes  
Yes  
2314 S. Miami Blvd.  
Ste. 252  
Durham, NC 27703
**WINDOWTESTER PRO**

Instantiations, Inc.

WindowTester Pro offers cutting-edge technology for testing Swing and SWT Java graphical user interfaces. Developers can focus on creating application-specific functionality rather than coding low-level tests required for validating GUIs. Systematic reuse of 100% JUnit-compatible GUI tests ensures that enduring value is realized over the lifespan of applications. WindowTester also provides a Rich GUI Test Library, hiding the complexities and threading issues of GUI test execution.

[www.instantiations.com/windowtester](http://www.instantiations.com/windowtester)
[sales@instantiations.com](mailto:sales@instantiations.com)

 telephone  
trial available  
training available  
address

 503.598.4900  
Yes  
Yes  
18101 SW Boones  
Ferry Rd.  
Ste. 200  
Portland, OR 97224
**XML-SIMULATOR**

Elvior

**XML-Simulator**

Elvior's XML-Simulator is a black box tester for applications using asynchronous XML messaging to communicate with other systems. There are a lot of client-server-based communication protocols that use XML messages to exchange data between the communicating peers. XML-Simulator is a tool that can be used to quickly create a counterpart application simulator for testing your peer application.

[www.xml-simulator.com](http://www.xml-simulator.com)
[elvior@elvior.ee](mailto:elvior@elvior.ee)

 telephone  
trial available  
training available  
address

 372.667.1737  
Yes  
Yes  
Mustamae tee 44  
Tallinn, Harjumaa  
10621 Estonia

**SOFTWARE QUALITY ENGINEERING CONFERENCES** assist professionals interested in improving software practices. Four conferences are hosted annually—the **STAR** conference series, the **Better Software Conference & EXPO**, and **Agile Development Practices**. Is testing your specialty? **STAREAST** and **STAR-WEST** are the largest and most advanced testing forums, providing you with countless networking opportunities, exclusive access to solutions providers, and the chance to get up close and personal with industry experts. Maybe your interest is in development lifecycle practices. If so, the **Better Software Conference & EXPO** provides the latest tools, trends, and issues related to agile development approaches, plan-driven development, process improvement, measurement, and much more. Is your environment more agile driven? **Agile Development Practices** focuses on investigating or implementing agile development practices, processes, technologies, and leadership principles. Attend one, or attend all. We have something to meet all of your software needs. [www.sqe.com/CONF09](http://www.sqe.com/CONF09)



## AQtime

eliminate leaks and bottlenecks

developers unparalleled insight into all aspects of the performance of their applications. AQtime provides a single solution for detecting performance bottlenecks and memory leaks within managed, unmanaged, and mixed-code applications. AQtime supports Microsoft Visual Studio, .NET, ASP.NET, C++, VB, Delphi, 32-bit, 64-bit, and more.

[www.automatedqa.com/products/aqnet.asp](http://www.automatedqa.com/products/aqnet.asp)  
[sales@automatedqa.com](mailto:sales@automatedqa.com)

### AQTIME

#### AutomatedQA

AQtime is a performance profiler and memory debugger engineered to give

telephone  
trial available  
training available  
address

978. 236.7900  
Yes  
Yes  
100 Cummings Center  
Ste. 420B  
Beverly, MA 01915



### CODEPRO PROFILER

#### Instantiations, Inc.

CodePro Profiler is an Eclipse-based software development product that enables Java developers to easily find performance problems early in the development cycle and automatically locate performance bottlenecks, memory leaks, and threading issues. CodePro Profiler offers highly accurate profiling with nearly zero overhead and on-demand profiling with powerful telemetry reporting. CodePro Profiler seamlessly integrates into the Eclipse development process and includes extensive best practices documentation and optimization guides.

[www.instantiations.com/codepro/profiler](http://www.instantiations.com/codepro/profiler)  
[sales@instantiations.com](mailto:sales@instantiations.com)

telephone  
trial available  
training available  
address

503.598.4900  
Yes  
Yes  
18101 SW Boones  
Ferry Rd.  
Ste. 200  
Portland, OR 97224



### CRUISE

#### ThoughtWorks

Cruise is a continuous integration and release management system that enables software teams to go live with new, tested features quickly and repeatably. By lowering the effort and risk associated with releasing complex applications, Cruise leaves your team free to focus on the stuff that really matters—delivering value through innovation. Cruise draws from the extensive continuous integration experience of ThoughtWorks, the creators of the original CruiseControl.

[www.thoughtworks.com/studios](http://www.thoughtworks.com/studios)  
[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone  
trial available  
training available  
address

512.382.5017  
Yes  
Yes  
1 Market St.  
Spear Tower  
35th Floor  
San Francisco, CA  
94105



### DEVTRACK

#### TechExcel, Inc.

DevTrack is a development-tracking tool that helps to ensure that quality products are developed and delivered on time and on budget by modeling business processes and aligning development with knowledge. Integrations with popular version control tools allow for items to be tracked with related source code.

[www.techexcel.com/products/devtrack.html](http://www.techexcel.com/products/devtrack.html)  
[sales@techexcel.com](mailto:sales@techexcel.com)

telephone  
trial available  
training available  
address

800. 439.7782 ext. 5  
Yes  
Yes  
3675 Mt. Diablo Blvd.  
Ste. 200  
Lafayette, CA 94549



### eVALID

#### Software Research, Inc.

The eValid suite supports all your automation requirements for the quality, reliability, and performance of your Web-based applications: GUI interaction, test data creation, functional and regression testing, load generation, and monitoring capability of your server. One system does it all. It is easy to use and is cost effective. Tests generated for regression can be reused for server loading or monitoring—all with easy point and click. eValid is optimized for testing every kind of live Web application—e-commerce, Ajax, and Web 2.0.

[www.e-valid.com/quick.summary.html](http://www.e-valid.com/quick.summary.html)  
[ritabral@soft.com](mailto:ritabral@soft.com)

telephone  
trial available  
training available  
address

415.861.2800  
Yes  
Yes  
1663 Mission St.  
Ste. 400  
San Francisco, CA  
94103



**FISH EYE****Atlassian Software Systems**

FishEye opens up your Subversion, CVS, or Perforce source code repository to help development teams keep tabs on

what's going on. Track code changes by subscribing to personalized RSS or email commit feeds. Browse your changelog and source by any combination of directory, author, branch, or tag. Write precise queries with simple EyeQL query language and run them via the public API. Chart line count by author, directory, and file type. Get file annotations and branch diagrams. Integrate easily with JIRA and other development tools.

[www.atlassian.com/software/fisheye](http://www.atlassian.com/software/fisheye)

[sales@atlassian.com](mailto:sales@atlassian.com)

telephone  
trial available  
training available  
address

415.701.1110 (US)  
Yes  
Yes  
Level 3, 275 George St.  
Sydney, NSW  
2000 Australia

**HP DIAGNOSTICS****HP Software & Solutions**

HP Diagnostics helps you improve application availability and performance in pre-production and production environments. You can drill down from the end-user into

application components and cross-platform service calls to resolve the toughest problems. This includes slow services, methods, SQL, out-of-memory errors, threading problems, and more.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014

**HP LOADRUNNER****HP Software & Solutions**

HP LoadRunner can help you prevent costly performance problems in production by detecting bottlenecks before a new system or upgrade is deployed. This software

enables you to measure end-to-end performance, diagnose application and system bottlenecks, and tune for better performance—all from a single point of control. This helps reduce the costs and time required to test and deploy new applications and systems into your production environment.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014

**LISA SOA TESTING, VALIDATION & VIRTUALIZATION SUITE****iTKO, Inc.**

iTKO's LISA SOA Testing, Validation & Virtualization suite pro-

vides a complete, collaborative, and continuous environment across every phase of software development and deployment. LISA's no-code environment automates SOA unit, functional, regression, and load test creation and execution—from rich Web apps to middle-tier technologies such as Web services, ESB messaging, databases, mainframes, and more. LISA's extensibility and virtualization of SOA behaviors eliminate dependencies in the lifecycle while increasing team agility.

[www.itko.com/site/products/index.jsp](http://www.itko.com/site/products/index.jsp)

[info@itko.com](mailto:info@itko.com)

telephone  
trial available  
training available  
address

877.BUY.ITKO  
Yes  
Yes  
1505 LBJ Fwy.  
Ste. 250  
Dallas, TX 75234

**McCabe IQ****McCabe Software**

The McCabe IQ suite is made up of three multi-platform, multi-language

software quality management solutions. McCabe IQ Developers Edition visualizes the complexity of source code and provides a host of metrics with which to measure quality. McCabe IQ Test Team Edition identifies precisely what areas of code have been tested and facilitates improved test plans. McCabe Enterprise Edition provides all the functionality of the Developers and Test Team Editions, in addition to enterprise reporting and Web-enabled test data collection.

[www.mccabe.com/iq.htm](http://www.mccabe.com/iq.htm)

[sales@mccabe.com](mailto:sales@mccabe.com)

telephone  
trial available  
training available  
address

401.572.3100  
Yes  
Yes  
41 Sharpe Dr.  
Cranston, RI 02920





**MINGLE**

ThoughtWorks

Mingle, the Agile project management and team collaboration tool, provides a shared workspace for your entire team. It adapts to the way project teams think and work, while supporting various flavors of Agile like XP, Scrum, and Agile Hybrid. Mingle is powerfully simple and builds upon 7+ years of ThoughtWorks' pioneering Agile delivery.

[www.thoughtworks.com/mingle](http://www.thoughtworks.com/mingle)  
[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone  
trial available  
training available  
address

512.382.5017  
Yes  
Yes  
1 Market St.  
Spear Tower  
35th Floor  
San Francisco, CA  
94105



**QADIRECTOR**

Compuware Corporation

Compuware QADirector is a powerful test management solution that gives QA organizations a framework for managing the entire testing process—from design to execution to analysis. It provides appropriate assignment of testing activities, improved efficiency, and accuracy of deliverables, as well as greater predictability and repeatability.

[www.compuware.com/products/qacenter/qadirector.htm](http://www.compuware.com/products/qacenter/qadirector.htm)  
[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

telephone  
trial available  
training available  
address

800.COMPUWARE  
Yes  
Yes  
One Campus Martius  
Detroit, MI 48226



**QA WIZARD PRO**

Seapine Software

QA Wizard Pro automates the functional and regression testing of Web and Windows applications. Featuring a next-generation scripting language and an easy-to-use Grid View, QA Wizard Pro includes advanced object searching, a global application repository, data-driven testing support, validation checkpoints, and built-in debugging. It also includes batch file support, a real-time status tool, and remote execution support. Focus on what you want to test—instead of how to test it—with Seapine QA Wizard Pro.

[www.seapine.com/qawizard.html](http://www.seapine.com/qawizard.html)  
[sales@seapine.com](mailto:sales@seapine.com)

telephone  
trial available  
training available  
address

513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040



**SURROUND SCM**

Seapine Software

Surround SCM, a scalable, cross-platform software configuration management solution, keeps source code and digital assets organized as it tracks change throughout your organization. Simple to configure and maintain, Surround features advanced branching, configurable workflows, user-definable fields, secure remote access, and easy integration into development and build processes. It also includes Unicode and WebDAV support, in-application triggers, email notifications, and an optional proxy server for distributed teams.

[www.seapine.com/surroundscm.html](http://www.seapine.com/surroundscm.html)  
[sales@seapine.com](mailto:sales@seapine.com)

telephone  
trial available  
training available  
address

513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040



**TELELOGIC FOCAL POINT**

IBM Rational

Telelogic Focal Point offers the only solution with the unique perspective of improving product value and increasing agility from idea conception through the product lifecycle with a continual focus on customer needs. Focal Point reduces the chaos of managing information in emails, documents, and spreadsheets by providing a collaborative environment for centralizing product information shared by product management, engineering, marketing, and other stakeholders.

[www.telelogic.com/products/focalpoint/](http://www.telelogic.com/products/focalpoint/)  
[cransom@us.ibm.com](mailto:cransom@us.ibm.com)

telephone  
trial available  
training available  
address

877.275.4777  
Yes  
Yes  
9401 Jeronimo Rd.  
Ste. 200  
Irvine, CA 92618



## Seapine Software™ TESTTRACK PRO

Seapine Software

TestTrack Pro, a scalable, cross-platform issue management solution, facilitates team collaboration across the enterprise. Simple to install, easy to use and maintain, TestTrack Pro features comprehensive workflow and process automation rules, powerful filters, escalation rules, email tracking, reports, and role-based security. It also includes extensive customizations, seamless integration with current development tools, and support for MS SQL Server, Oracle, and MySQL. Keep team members informed and on schedule with TestTrack Pro.

[www.seapine.com/ttpro.html](http://www.seapine.com/ttpro.html)

[sales@seapine.com](mailto:sales@seapine.com)

telephone  
trial available  
training available  
address

513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040



## TR SIZER

Mosaic, Inc.

TR Sizer is a measurement repository and software sizing tool that supports an alternative sizing measure—testable requirements (TRs). TRs are an intuitive, flexible, easily implemented, and powerful alternative to function points and lines of code. Measuring system size enables more reliable estimates, enhanced change control, increased accountability for outsourced work, more effective EVM, and improved measurement of quality and productivity. Based on requirements, the TR measure also highlights and helps manage requirement risk.

[www.testablerequirements.com](http://www.testablerequirements.com)

[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

telephone  
trial available  
training available  
address

312.819.2220  
No  
Yes  
205 N. Michigan Ave.  
Ste. 2211  
Chicago, IL 60601



## WEB PERFORMANCE LOAD TESTER

Web Performance Inc.

Web Performance Load Tester is Web load testing and Web stress testing software and tools targeted at Web sites that use standard technologies such as Web forms, J2EE, ASP, .NET, PHP, ColdFusion, Java, etc. Its automatic analysis can tell you how many users your Web site is capable of handling at one time using your own unique performance criteria. Web Performance Load Tester includes all of the advanced features needed to test the latest Ajax and SOAP-based architectures such as automatic dynamic variable replacement, all types of authentication, IP-spoofing, etc.

[www.webperformanceinc.com](http://www.webperformanceinc.com)

[czei@webperformanceinc.com](mailto:czei@webperformanceinc.com)

telephone  
trial available  
training available  
address

919.845.7601  
Yes  
Yes  
2314 S. Miami Blvd.  
Ste. 252  
Durham, NC 27703



## BugHost

Active-X.COM

The most comprehensive and innovative BugHost service now includes all the tools you need to get your project delivered on-time: High-volume user and project licenses, requirements documents and change requests, individual and project-level task tracking, project management, custom fields, customizable discussion forum, custom reports, file system, test case management, and much more! With so many features, bug tracking, requirements, writing test cases, task tracking, scheduling, and management just got easier.

[www.bughost.com](http://www.bughost.com)

[gregory.alekel@bughost.com](mailto:gregory.alekel@bughost.com)

telephone  
trial available  
training available  
address

503.345.4349  
Yes  
No  
PO Box 3106  
Portland, OR 97208





**ProjectLocker™**  
Software Quality On Demand™

**BUILDLOCKER**

One Percent Software

BuildLocker is a Web-based continuous integration solution for Java and .NET projects. BuildLocker is a virtual dedicated build machine that helps teams detect and identify defects and other code integration issues faster and more effectively in the development cycle, consequently cutting down on time to market for your particular application. BuildLocker allows you to schedule an automated build to occur monthly, weekly, nightly, every four hours, and even for every commit to your source code repository.

[projectlocker.com/site/build\\_locker](http://projectlocker.com/site/build_locker)

[sales@onepercentsoftware.com](mailto:sales@onepercentsoftware.com)

telephone  
trial available  
training available  
address

866.464.3875 ext. 3  
Yes  
Yes  
100 Peachtree St. NW  
Ste. 610  
Atlanta, GA 30303



**CODE COLLABORATOR**

Smart Bear Inc.

Code Collaborator enables peer review of source code changes before or after files are checked into version control. Automate audit trails, enforce workflow, and generate reports. Works equally well for on-site and off-shore inspections.

Integrates with SCM, issue-tracking, reporting, and other external systems.

[codecollaborator.com](http://codecollaborator.com)

[info@codecollaborator.com](mailto:info@codecollaborator.com)

telephone  
trial available  
training available  
address

512.257.1569  
Yes  
Yes  
12885 Research Blvd.  
Ste. 210  
Austin, TX 78750



**DEVTEST**

TechExcel, Inc.

DevTest is a development-tracking tool that helps to ensure that quality products are developed and delivered on time and on budget by modeling business processes and aligning development with knowledge. Integrations with popular version control tools allow for items to be tracked with related source code.

[www.techexcel.com/products/devtest.html](http://www.techexcel.com/products/devtest.html)

[sales@techexcel.com](mailto:sales@techexcel.com)

telephone  
trial available  
training available  
address

800.439.7782 ext. 5  
Yes  
Yes  
3675 Mt. Diablo Blvd.  
Ste. 200  
Lafayette, CA 94549



**DEVTRACK**

TechExcel, Inc.

DevTrack is a development-tracking tool that helps to ensure that quality products are developed and delivered on time and on budget by modeling business processes and aligning development with knowledge. Integrations with popular version control tools allow for items to be tracked with related source code.

[www.techexcel.com/products/devtrack.html](http://www.techexcel.com/products/devtrack.html)

[sales@techexcel.com](mailto:sales@techexcel.com)

telephone  
trial available  
training available  
address

800.439.7782 ext. 5  
Yes  
Yes  
3675 Mt. Diablo Blvd.  
Ste. 200  
Lafayette, CA 94549



**DSTAR**

Mosaic, Inc.

DSTAR is an ODBC-compliant Quality Center add-on that manages the test data required for manual and automated testing. It tracks and maintains test data assignments for reusable tests in Quality Center. DSTAR controls and maintains data extracted from databases or created externally. Through integration with Quality Center, DSTAR allows test data assignments to be maintained as late as test execution time and then provides the data for test execution. DSTAR includes an integrated test automation framework and management reporting.

[www.mosaicinc.com](http://www.mosaicinc.com)

[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

telephone  
trial available  
training available  
address

312.819.2220  
No  
Yes  
205 N. Michigan Ave.  
Ste. 2211  
Chicago, IL 60601



**ELECTRICCOMMANDER**

ElectricCloud Inc.

ElectricCommander is an enterprise-class automation platform for the entire build-test-deploy process. Unlike traditional continuous integration servers, ElectricCommander has an extensible architecture that can scale to support multiple teams, working in multiple locations, and developing for multiple platforms—with a single system. It is simple to roll out, provides traceability for compliance efforts, and supports continuous integration and agile development techniques.

[www.electric-cloud.com/products/electriccommander.php](http://www.electric-cloud.com/products/electriccommander.php)
[sales@electric-cloud.com](mailto:sales@electric-cloud.com)

 telephone  
trial available  
training available  
address

 408.419.4300  
Yes  
Yes  
676 West Maude Ave.  
Sunnyvale, CA 94085
**FISHEYE**

Atlassian Software Systems

FishEye opens up your Subversion, CVS, or Perforce source code repository to help development teams keep tabs on what's going on. Track code changes by subscribing to personalized RSS or email commit feeds. Browse your changelog and source by any combination of directory, author, branch, or tag. Write precise queries with simple EyeQL query language and run them via the public API. Chart line count by author, directory, and file type. Get file annotations and branch diagrams. Integrate easily with JIRA and other development tools.

[www.atlassian.com/software/fisheye](http://www.atlassian.com/software/fisheye)
[sales@atlassian.com](mailto:sales@atlassian.com)

 telephone  
trial available  
training available  
address

 415.701.1110 (US)  
Yes  
Yes  
Level 3, 275 George St.  
Sydney, NSW  
2000 Australia


## ® HP BUSINESS PROCESS TESTING

HP Software &amp; Solutions

HP Business Process Testing software is a Web-based test design solution that bridges the quality chasm between subject matter experts and quality engineers. This role-based system enables subject matter experts to build, data-drive, and execute manual and automated tests without any programming knowledge. It reduces the overhead required to test maintenance and combines test automation and documentation into a single effort.

[www.hp.com/go/software](http://www.hp.com/go/software)
[judy.perez@hp.com](mailto:judy.perez@hp.com)

 telephone  
trial available  
training available  
address

 408.725.8900  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014


## ® HP CENTER MANAGEMENT FOR PERFORMANCE CENTER

HP Software &amp; Solutions

HP Center Management for Performance Center software enables you to deploy a successful testing Center of Excellence. This out-of-the-box demand, project, and resource management solution provides consistency, control, and visibility across your testing activities. It enables your IT organization to leverage common solutions, methodologies, and templates in a way that greatly improves your performance testing process.

[www.hp.com/go/software](http://www.hp.com/go/software)
[judy.perez@hp.com](mailto:judy.perez@hp.com)

 telephone  
trial available  
training available  
address

 408.725.8900  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014


## ® HP CENTER MANAGEMENT FOR QUALITY CENTER

HP Software &amp; Solutions

HP Center Management for Quality Center software helps your organization manage HP Quality Center software as a shared Center of Excellence. The combination of proven best practices and HP Project and Portfolio Management software enables your organization to conquer your quality management challenges. You can manage application project lifecycle and quality assurance test phases, resources, and skill sets; automate project and resource management processes; and improve center administration and management.

[www.hp.com/go/software](http://www.hp.com/go/software)
[vw@hp.com](mailto:vw@hp.com)

 telephone  
trial available  
training available  
address

 408.447.0181  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014





® HP FUNCTIONAL TESTING

HP Software & Solutions

HP Functional Testing software delivers a complete automated solution for functional, graphical user interface, and regression testing that helps you reduce the risks of application failures. This software enables your entire team to correct functionality across all environments, data sets, and business processes. You can also create sophisticated test suites with minimal training and easily perform regression testing in constantly changing environments.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



® HP QUICKTEST PROFESSIONAL

HP Software & Solutions

The key features of HP QuickTest Professional software allow you to create sophisticated test suites with minimal training; improve collaboration between workgroups with shared function libraries, object management, and flexible asset storage; collapse test documentation and test creation to a single step; and fix defects faster by fully documenting and replicating defects for developers.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



® HP SERVICE TEST

HP Software & Solutions

HP Service Test software is a SOA testing solution that simplifies and accelerates the automated functional testing of SOA services. It reduces the time required to test SOA services and helps ensure that these services meet your business requirements prior to deployment. HP Service Test software enables your organization to simplify your testing processes and minimize the need for scripting by automating capabilities.

[www.hp.com/go/software](http://www.hp.com/go/software)

[vw@hp.com](mailto:vw@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



® HP TESTDIRECTOR FOR QUALITY CENTER

HP Software & Solutions

HP TestDirector for Quality Center software offers a single, Web-based application that supports all essential aspects of test management. It provides a consistent, repeatable process for gathering requirements, planning and scheduling tests, analyzing results, and managing defects and issues. This software enables your organization to digitize specific quality processes and procedures within the larger application lifecycle. It also supports high levels of communication and collaboration among your IT team.

[www.hp.com/go/software](http://www.hp.com/go/software)

[vw@hp.com](mailto:vw@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



JAMA CONTOUR

Jama Software

As the #1 Web-based requirements management software, Contour provides a collaborative, easy-to-use solution to help companies build great software products. With Contour, you don't have to change your process, and you achieve immediate benefits: SPEED—Contour cuts product planning and requirements management cycles in half, ALIGNMENT—Contour keeps your entire team in sync throughout the product development process, QUALITY—Contour helps you reduce costly errors and ensure high quality releases on time.

[www.jamasoftware.com](http://www.jamasoftware.com)

[ewinquist@jamasoftware.com](mailto:ewinquist@jamasoftware.com)

telephone  
trial available  
training available  
address

503.892.2731  
Yes  
Yes  
2828 SW Corbett Ave.  
Ste. 119  
Portland, OR 97201



**JIRA****Atlassian Software Systems**

JIRA is a Web-based bug-tracking application. Technical teams adopt JIRA to track and manage issues and bugs that emerge during a project. JIRA

focuses on task achievement, is instantly usable, and is highly flexible to work with. JIRA has also been widely used by all teams interacting with technical teams within an organization such as finance, HR, and production. Customers include NASA, Boeing, Cisco, JP Morgan, 3M, BP, Sony, and more. To learn more about JIRA or to download a 30-day evaluation, go to [www.atlassian.com/software/jira](http://www.atlassian.com/software/jira).

[www.atlassian.com/software/jira/](http://www.atlassian.com/software/jira/)

[jon@atlassian.com](mailto:jon@atlassian.com)

telephone  
trial available  
training available  
address

1.415.701.1110  
Yes  
Yes  
Level 3, 275 George St.  
Sydney, NSW  
2000 Australia

**Kovair GLOBAL LIFECYCLE—ENTERPRISE EDITION****Kovair Software, Inc.**

Kovair offers a software development lifecycle management solution that comes with out-of-the-box functionalities for requirements, test, change, and help desk management. It allows for the creation of any "user-defined entities" for additional functions in the same application. It contains the industry-leading configurable process engine that can automate any desired process with visual design capabilities. Kovair's Omnibus enables integrations with other vendor tools that create the only multirepository ALM platform today.

[www.kovair.com/products-ented.asp](http://www.kovair.com/products-ented.asp)

[sales@kovair.com](mailto:sales@kovair.com)

telephone  
trial available  
training available  
address

408.262.0200 ext. 2007  
Yes  
Yes  
1533 California Cir.  
Milpitas, CA 95035

**LDRA TESTBED****LDRA Ltd.**

LDRA Testbed is a static analysis and code coverage tool for C, C++, Ada83/Ada95, and Assembler (Intel, Freescale, Texas Instruments).

Static analysis features include code visualization, programming standards checking, and complexity metrics. Code coverage is available for different coverage levels including MC/DC level A for the D0-178B standard, regression testing, and is available for any host/target environment.

[www.ldra.com/testbed.asp](http://www.ldra.com/testbed.asp)

[info@ldra.com](mailto:info@ldra.com)

telephone  
trial available  
training available  
address

44.0.151.649.9300  
Yes  
Yes  
Portside, Monks Ferry  
Wirral, CH41 5LH  
United Kingdom

**McCabe CM—TRUECHANGE****McCabe Software**

McCabe CM is the only Software Change and Configuration Management solution to utilize "Integrated Difference" technology, providing an intuitive and logical approach to managing software versioning and changes. The drag-and-drop stream view allows you to securely apply change across the application lifecycle in seconds instead of days. McCabe CM helps you manage your change process, speed application delivery, and ultimately improve the quality of your software—all at a lower total cost of ownership.

[www.mccabe.com/cm.htm](http://www.mccabe.com/cm.htm)

[sales@mccabe.com](mailto:sales@mccabe.com)

telephone  
trial available  
training available  
address

401.572.3100  
Yes  
Yes  
41 Sharpe Dr.  
Cranston, RI 02920

**MESSAGEMAGIC****Elvior**

MessageMagic is ideal for incremental software development. It supports black box testing of an individual task or process, subsystems integration tests, and SW/HW integration tests. MessageMagic contains text-based TTCN-3 editor, compiler, and debugger. It supports TTCN-3 TCI and TRI interfaces. The user-friendly GUI allows users to develop, execute, and analyze test suites efficiently. MessageMagic simplifies and accelerates product development—with all the benefits that derive from shorter development cycles.

[messagemagic.elvior.ee](http://messagemagic.elvior.ee)

[andres.kull@elvior.ee](mailto:andres.kull@elvior.ee)

telephone  
trial available  
training available  
address

372.667.1737  
Yes  
Yes  
Mustamäe tee 44  
Tallinn, Harjumaa  
10621 Estonia





MINGLE

ThoughtWorks

Mingle, the Agile project management and team collaboration tool, provides a shared workspace for your entire team. It adapts to the way project teams think and work, while supporting various flavors of Agile like XP, Scrum, and Agile Hybrid. Mingle is powerfully simple and builds upon 7+ years of ThoughtWorks' pioneering Agile delivery.

[www.thoughtworks.com/mingle](http://www.thoughtworks.com/mingle)  
[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone  
trial available  
training available  
address

512.382.5017  
Yes  
Yes  
1 Market St.  
Spear Tower  
35th Floor  
San Francisco, CA  
94105



MKS INTEGRITY

MKS Inc.

MKS Integrity is an enterprise application lifecycle management platform that coordinates and manages all activities and artifacts associated with software development including requirements management, software configuration and change management, test management, defect management, deployment management, and portfolio management for applications. MKS's unified platform provides enterprise scalability and multi-platform capability to deliver higher team productivity, visibility, and compliance for engineering and IT organizations.

[www.mks.com/solutions](http://www.mks.com/solutions)  
[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



MKS INTEGRITY FOR REQUIREMENTS MANAGEMENT

MKS Inc.

MKS Integrity for Requirements Management enables organizations to address the primary causes of software project failures. Built on the foundation of a single ALM platform, MKS Integrity enables organizations to capture and validate software requirements, link them to downstream development and testing activities, and manage their completion through a unified process across the lifecycle. Capabilities for requirements change management and reuse enable the business to improve agility and visibility and reduce software project risk.

[www.mks.com/products/requirements](http://www.mks.com/products/requirements)  
[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



MKS INTEGRITY FOR SOFTWARE CHANGE AND CONFIGURATION MANAGEMENT

MKS Inc.

MKS Integrity for SCCM is an enterprise platform that enables organizations to more effectively develop and deliver software in a collaborative manner across geographic locations. MKS Integrity allows a team to make well-informed decisions by providing visibility across all activities and artifacts in the application development lifecycle, combined with process-driven change and configuration management capabilities. Full lifecycle traceability and explicit support for software reuse improve agility and reduce time to market.

[www.mks.com/products/source](http://www.mks.com/products/source)  
[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



MORAE

TechSmith Corporation

Morae is the premier software for deeply understanding customer experiences—and sharing those insights clearly and powerfully. Use Morae to record exactly what customers do and say, discover patterns in the data, key in on significant moments, and build a compelling case for how to improve the customer experience. From usability testing to focus groups and beyond, Morae helps you transform designs and marketing to make things people love.

[www.techsmith.com/morae.asp](http://www.techsmith.com/morae.asp)  
[www.techsmith.com/sales](http://www.techsmith.com/sales)

telephone  
trial available  
training available  
address

517.381.2300  
Yes  
Yes  
2405 Woodlake Dr.  
Okemos, MI 48864



**MSTAR**

Mosaic, Inc.

MSTAR is the industry's most advanced testing process.

This intranet-ready repository provides complete field-proven guidelines, templates, and samples for a risk-based and measurable testing process. MSTAR also enables successful test automation with a tool-independent automation architecture proven to reduce maintenance and resource costs while dramatically improving long-term benefits. MSTAR includes complete guidelines for reusable test planning and test data management. It covers all test levels including performance testing.

[www.mosaicinc.com/mosaicinc/mstar.asp](http://www.mosaicinc.com/mosaicinc/mstar.asp)
[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

 telephone  
trial available  
training available  
address

 312.819.2220  
No  
Yes  
205 N. Michigan Ave.  
Ste. 2211  
Chicago, IL 60601
**OPENMAKE MEISTER**

OpenMake Software

By managing more build engines—such as MSBuild and Ant—OpenMake Meister automates 100% of the build to release process. Unlike any of its competitors, Meister offers reusable Build Services that eliminates costly, redundant, and error-prone manual scripting related to both ALM and build activities. Meister provides the highest level of integration with development tools and build engines. Workflow tools offer only 10% automation—Meister's Build Services does the other 90%, too.

[www.openmakesoftware.com](http://www.openmakesoftware.com)
[tracy.ragan@openmakesoftware.com](mailto:tracy.ragan@openmakesoftware.com)

 telephone  
trial available  
training available  
address

 312.440.9545  
Yes  
Yes  
213 W. Institute Pl.  
#404  
Chicago, IL 60610
**OPTIMAL TRACE**

Compuware Corporation

Compuware Optimal Trace provides requirements capture and management capabilities in a single solution and enables IT and the business to collaborate more effectively. It enables the delivery of high-quality

applications by facilitating the capture of well-defined requirements that can be fully traced through the project lifecycle.

[www.compuware.com/optimaltrace](http://www.compuware.com/optimaltrace)
[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

 telephone  
trial available  
training available  
address

 800.COMPUWARE  
Yes  
Yes  
One Campus Martius  
Detroit, MI 48226
**ORACLE FUNCTIONAL TESTING FOR WEB APPLICATIONS**

Oracle

Oracle Functional Testing for Web Applications is an easy-to-use functional and regression testing tool that allows you to automate your testing processes. Oracle Functional Testing for Web Applications is a component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)
[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

 telephone  
trial available  
training available  
address

 800.ORACLE1  
Yes  
Yes  
500 Oracle Pkwy.  
Redwood Shores, CA  
94065
**ORACLE LOAD TESTING FOR WEB APPLICATIONS**

Oracle

Oracle Load Testing for Web Applications not only stresses your application to simulate the impact of end-user workloads but it also enables rigorous validation that protocol-based legacy client server testing tools cannot provide. Oracle Load Testing for Web Applications is a component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)
[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

 telephone  
trial available  
training available  
address

 800.ORACLE1  
Yes  
Yes  
500 Oracle Pkwy.  
Redwood Shores, CA  
94065



## ORACLE®

### ORACLE TEST MANAGER FOR WEB APPLICATIONS Oracle

Oracle Test Manager for Web Applications is a flexible, easy-to-use test process management solution on which you can build and organize your entire testing process. Oracle Test Manager for Web Applications is a key component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications. [www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)  
[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

telephone	800.ORACLE1
trial available	Yes
training available	Yes
address	500 Oracle Pkwy. Redwood Shores, CA 94065



### ProjectLocker™

Software Quality On Demand™

### PROJECTLOCKER

#### One Percent Software

ProjectLocker bundles source control through Subversion with bug tracking, project management, and wiki collaboration through Trac, all hosted and securely accessible over the Internet 24/7. Subscriptions include unlimited SVN and Trac repositories, unlimited bandwidth, SSL encryption, inbound email ticketing for Trac, redundant RAID storage, hourly encrypted-at-rest backups, email support, and a 30-day money back guarantee. [www.projectlocker.com/scenario/startup](http://www.projectlocker.com/scenario/startup)  
[sales@onepercentsoftware.com](mailto:sales@onepercentsoftware.com)

telephone	866.464.3875 ext. 3
trial available	Yes
training available	Yes
address	100 Peachtree St. NW Ste. 610 Atlanta, GA 30303



### RALLY COMMUNITY EDITION

#### Rally Software Development

Rally is the #1 partner for Agile success through products, coaching, and community support. With a dedicated focus on Agile, Rally helps organizations of all sizes shorten development cycles and collaborate across distributed teams and silos.

Rally's on-demand Agile lifecycle management products were honored with three-time Jolt Product Excellence Awards (the industry's Oscars) in 2006, 2007, and 2008 and support 900 customers, 20,000 projects, and 35,000 users in 50 countries. [www.rallydev.com](http://www.rallydev.com)  
[www.rallydev.com/?src=stickymindsTG08](http://www.rallydev.com/?src=stickymindsTG08)  
[jami.yannett@rallydev.com](mailto:jami.yannett@rallydev.com)

telephone	303.565.2800
trial available	Yes
training available	Yes
address	4001 Discovery Dr. Ste. 220 Boulder, CO 80303



### RALLY ENTERPRISE EDITION

#### Rally Software Development

Rally is the #1 partner for Agile success through products, coaching, and community support. With a dedicated focus on Agile, Rally helps organizations of all sizes shorten development cycles and collaborate across distributed teams and silos.

Rally's on-demand Agile lifecycle management products were honored with three-time Jolt Product Excellence Awards (the industry's Oscars) in 2006, 2007, and 2008 and support 900 customers, 20,000 projects, and 35,000 users in 50 countries. [www.rallydev.com](http://www.rallydev.com)  
[www.rallydev.com/?src=stickymindsTG08](http://www.rallydev.com/?src=stickymindsTG08)  
[jami.yannett@rallydev.com](mailto:jami.yannett@rallydev.com)

telephone	303.565.2800
trial available	Yes
training available	Yes
address	4001 Discovery Dr. Ste. 220 Boulder, CO 80303



### RANOREX GUI TEST AUTOMATION FRAMEWORK

#### Ranorex

Ranorex is a cost-effective and comprehensive GUI test automation framework for developers and testers regardless of their programming or scripting experience. Ranorex supports testing of .NET, VB, Adobe Flash/Flex, Delphi, Java, and Web applications, using common languages such as C#, VB.NET, or Python. In addition, an object-based Capture/Replay editor enhances the generation of reusable test automation recordings.

[www.ranorex.com](http://www.ranorex.com)  
[info@ranorex.com](mailto:info@ranorex.com)

telephone	43.316.28.13.28
trial available	Yes
training available	Yes
address	Strassgangerstr. 289 Graz, Steiermark 8054 Austria





## REQUIREMENTS CENTER

## Blueprint

Blueprint aligns business and IT teams by delivering the industry's first comprehensive workbench designed specifically for the business analyst. Blueprint Requirements Center empowers analyst teams to eliminate requirements misunderstanding by capturing, validating, and delivering precise business requirements to local or distributed IT application project teams. Blueprint's product line functions as a collaborative system for the requirements lifecycle, including requirements elicitation, elaboration, validation, and acceptance.

[www.blueprintsys.com](http://www.blueprintsys.com)

[nada.tiberio@blueprintsys.com](mailto:nada.tiberio@blueprintsys.com)

telephone  
trial available  
training available  
address

647.288.0732  
Yes  
Yes  
372 Bay St.  
Ste. 1600  
Toronto, Ontario  
M5H 2W9 Canada



## SILKCENTRAL TEST MANAGER

## Borland USA

Borland SilkCentral Test Manager is the only solution you need to manage all aspects of the application testing process—from establishing testing requirements aligned with end-user needs and specifications to planning, scheduling, and executing tests in physical or virtual test labs to tracking and resolving issues. You can centrally manage all test types—from development stage unit tests to final user acceptance tests and provide role-based access to all application requirements, specifications, test plans, and quality metrics.

[www.borland.com/us/products/silk/silkcentral\\_test/index.html](http://www.borland.com/us/products/silk/silkcentral_test/index.html)

[sales@borland.com](mailto:sales@borland.com)

telephone  
trial available  
training available  
address

512.340.2200  
Yes  
Yes  
8310 N. Capital of  
Texas Hwy.  
Building 2, Ste. 100  
Austin, TX 78731



## SILKPERFORMER

## Borland USA

Borland SilkPerformer offers a cost-effective, enterprise-class tool for software application performance and load testing, delivering automated software load, stress, and performance testing in an open and sharable model. With SilkPerformer, you can create powerful, realistic load tests for thousands of users running business scenarios across a broad range of enterprise application environments to identify bottlenecks and then apply powerful diagnostics to resolve performance issues.

[www.borland.com/us/products/silk/silkperformer/index.html](http://www.borland.com/us/products/silk/silkperformer/index.html)

[sales@borland.com](mailto:sales@borland.com)

telephone  
trial available  
training available  
address

512.340.2200  
Yes  
Yes  
8310 N. Capital of  
Texas Hwy.  
Building 2, Ste. 100  
Austin, TX 78731



## SILKTEST

## Borland USA

Borland SilkTest is the proven choice of QA professionals for powerful functional and regression test automation. Intuitive GUI record-and-play capabilities—coupled with a stable, easy-to-use testing language—enable you to build functional and regression tests that do not break with minor changes to the application, a problem that makes most functional testing tools too costly to implement. SilkTest delivers time-tested stability and support for major enterprise environments in a cost-effective package.

[www.borland.com/us/products/silk/silktest/index.html](http://www.borland.com/us/products/silk/silktest/index.html)

[sales@borland.com](mailto:sales@borland.com)

telephone  
trial available  
training available  
address

512.340.2200  
Yes  
Yes  
8310 N. Capital of  
Texas Hwy.  
Building 2, Ste. 100  
Austin, TX 78731



GO VIRTUAL

## SKYTAP VIRTUAL LAB

## Skytap, Inc.

Skytap Virtual Lab is a hosted, on-demand service for virtual lab automation and management. It enables QA professionals to rapidly build and configure test, training, and demo lab environments using pre-configured virtual machines in the Skytap Library; get access to hardware, storage, and networking resources on demand using just a browser; and collaborate with other team members in a virtual environment, wherever they are in the world.

[www.skytap.com/products/virtual-lab-overview](http://www.skytap.com/products/virtual-lab-overview)

[alex@skytap.com](mailto:alex@skytap.com)

telephone  
trial available  
training available  
address

888.SKYTAP8  
Yes  
Yes  
614 1st Ave.  
Ste. 200  
Seattle, WA 98104





## Software Planner

[www.softwareplanner.com](http://www.softwareplanner.com)

Software Planner is an award-winning application lifecycle management tool that helps information technology departments manage all components of software development including managing customer requirements, project deliverables, test cases, defects, and support tickets. Coupled with collaborative tools like document sharing, team calendars, interactive dashboards, knowledge bases, and threaded discussions, teams begin communicating more effectively and begin delivering solutions quickly and with high quality.

[www.softwareplanner.com](http://www.softwareplanner.com)

[sales@pragmaticsw.com](mailto:sales@pragmaticsw.com)

### SOFTWARE PLANNER

Pragmatic Software Co., Inc.

telephone  
trial available  
training available  
address

800.773.7785  
Yes  
Yes  
383 Inverness Pkwy.  
Ste. 280  
Englewood, CO 80112



### SURROUND SCM

Seapine Software

Surround SCM, a scalable, cross-platform software configuration management solution, keeps source code and digital assets organized as it tracks change throughout your organization. Simple to configure and maintain, Surround features advanced branching, configurable workflows, user-definable fields, secure remote access, and easy integration into development and build processes. It also includes Unicode and WebDAV support, in-application triggers, email notifications, and an optional proxy server for distributed teams.

[www.seapine.com/surroundscm.html](http://www.seapine.com/surroundscm.html)

[sales@seapine.com](mailto:sales@seapine.com)

telephone  
trial available  
training available  
address

513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040



### TARGETPROCESS

TargetProcess, Inc.

Founded in 2004, TargetProcess had a vision to pioneer an easy-to-deploy but comprehensive solution that reduces the complexity of software project management. TargetProcess assists software development teams in managing agile development processes, including Scrum, XP, and other agile processes. The company's mission is to simplify the planning, tracking, and quality assurance required by shortened development cycles in agile process development.

[www.targetprocess.com](http://www.targetprocess.com)

[andrey@targetprocess.com](mailto:andrey@targetprocess.com)

telephone  
trial available  
training available  
address

877.718.2617 ext.704  
Yes  
Yes  
PO Box 1845  
Amherst, NY 14228



### TBREQ

LDRA Ltd.

TBreq is a unique solution that can help development teams overcome the challenges of mapping test specifications, unit testing scenarios, test data, and code coverage verification back to their high-level design requirements. TBreq interfaces directly with management tools such as Telelogic DOORS, IBM Rational RequisitePro, Microsoft Word documents, or Excel spreadsheets in order to ensure traceability across the complete software lifecycle thus verifying the completeness of the requirements coverage.

[www.ldra.com/tbreq.asp](http://www.ldra.com/tbreq.asp)

[info@ldra.com](mailto:info@ldra.com)

telephone  
trial available  
training available  
address

44.0.151.649.9300  
Yes  
Yes  
Portside, Monks Ferry  
Wirral, CH41 5LH  
United Kingdom



### TBRUN

LDRA Ltd.

TBrun is LDRA's automated unit testing tool. The functionality within TBrun includes a GUI interface, which automates the production of test data vectors (by using TBeXtreme) while test harness and stub generation is completely automatic. It also produces the test documentation and other reports. Automatic generation of test data vectors can be provided by TBeXtreme for robustness, test scenarios, and support of black box, white box, and object box testing.

[www.ldra.com/tbrun.asp](http://www.ldra.com/tbrun.asp)

[info@ldra.com](mailto:info@ldra.com)

telephone  
trial available  
training available  
address

44.0.151.649.9300  
Yes  
Yes  
Portside, Monks Ferry  
Wirral CH41 5LH  
United Kingdom





## TELELOGIC CHANGE

IBM Rational

Telelogic Change provides a unifying change management platform that enables you to align your technology investments with your enterprise objectives by automating and integrating the evolution of changes in your organization. With its central change management platform, Telelogic Change ensures that all processes for the development and delivery of software, systems, and IT can be defined, implemented, automated, visualized, and, thus, managed independent of the actual underlying tools.

[www.telelogic.com/change](http://www.telelogic.com/change)
[info@telelogic.com](mailto:info@telelogic.com)

telephone	949.830.8022
trial available	No
training available	Yes
address	9401 Jeronimo Rd. Ste. 200 Irvine, CA 92618



## TELELOGIC SYNERGY

IBM Rational

Telelogic Synergy 7.0 is a global software and systems development platform that features advanced capabilities for high-end SCM and support for managing your software development and delivery environment. With Synergy 7.0, customers can control their critical software development requirements and collaborate on advanced systems delivery. It provides agility through task-based configuration management and advanced SCM capabilities with the ability to work over a heavily distributed environment over a single central server.

[www.telelogic.com/synergy](http://www.telelogic.com/synergy)
[info@telelogic.com](mailto:info@telelogic.com)

telephone	949.830.8022
trial available	No
training available	Yes
address	9401 Jeronimo Rd. Ste. 200 Irvine, CA 92618



## TELELOGIC DOORS

IBM Rational

Telelogic DOORS, the world's leading requirements management solution for advanced systems and software development projects, helps you deliver higher quality systems and software by improving requirements communication, collaboration, and verification across the enterprise. DOORS is a multi-platform system designed to ensure conformance to requirements and compliance to regulations by capturing, linking, analyzing, and managing changes to requirements and their traceability.

[www.telelogic.com/corp/products/doors/index.cfm](http://www.telelogic.com/corp/products/doors/index.cfm)
[info@telelogic.com](mailto:info@telelogic.com)

telephone	877.275.4777
trial available	Yes
training available	Yes
address	9401 Jeronimo Rd. Irvine, CA 92618



## TESTTRACK PRO

Seapine Software

TestTrack Pro, a scalable, cross-platform issue management solution, facilitates team collaboration across the enterprise. Simple to install, easy to use and maintain, TestTrack Pro features comprehensive workflow and process automation rules, powerful filters, escalation rules, email tracking, reports, and role-based security. It also includes extensive customizations, seamless integration with current development tools, and support for MS SQL Server, Oracle, and MySQL. Keep team members informed and on schedule with TestTrack Pro.

[www.seapine.com/ttpro.html](http://www.seapine.com/ttpro.html)
[sales@seapine.com](mailto:sales@seapine.com)

telephone	513.754.1655
trial available	Yes
training available	Yes
address	5412 Courseview Dr. Ste. 200 Mason, OH 45040



## TR SIZER

Mosaic, Inc.

TR Sizer is a measurement repository and software sizing tool that supports an alternative sizing measure—testable requirements (TRs). TRs are an intuitive, flexible, easily implemented, and powerful alternative to function points and lines of code. Measuring system size enables more reliable estimates, enhanced change control, increased accountability for outsourced work, more effective EVM, and improved measurement of quality and productivity. Based on requirements, the TR measure also highlights and helps manage requirement risk.

[www.testablerequirements.com](http://www.testablerequirements.com)
[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

telephone	312.819.2220
trial available	No
training available	Yes
address	205 N. Michigan Ave. Ste. 2211 Chicago, IL 60601





## VERSIONONE

*Simplifying Software Delivery*

### V1: AGILE ENTERPRISE

VersionOne

To help ensure success using Agile methodologies, enterprises worldwide have made V1: Agile Enterprise the #1 Agile project management software choice for any type of Agile methodology. V1: Agile Enterprise is an easy-to-use, centralized Agile planning and management system that is perfect for multi-team, multi-project organizations, as well as experienced Agile teams. With integrated Agile processes and improved alignment between business and IT, V1: Agile Enterprise is the most scalable, flexible, and informative tool on the market.

[www.versionone.com](http://www.versionone.com)

[robert.holler@versionone.net](mailto:robert.holler@versionone.net)

telephone  
trial available  
training available  
address

678.268.3320  
Yes  
Yes  
6220 Shiloh Rd.  
Ste. 400  
Alpharetta, GA 30005



## VERSIONONE

*Simplifying Software Delivery*

### V1: AGILE TEAM

VersionOne

V1: Agile Team combines VersionOne's industry-leading Agile project management expertise with the needs of smaller teams or teams new to Agile. By focusing on core Agile concepts—team collaboration, continuous planning, and incremental delivery—we've created a streamlined solution that gives teams everything they need to quickly and easily get started with Agile planning, tracking, and reporting. With V1: Agile Team, your team will stay on schedule and deliver software on time.

[www.versionone.com](http://www.versionone.com)

[richard.fuller@versionone.net](mailto:richard.fuller@versionone.net)

telephone  
trial available  
training available  
address

678.268.3320  
Yes  
Yes  
6220 Shiloh Rd.  
Ste. 400  
Alpharetta, GA 30005



### VECTORCAST

Vector Software, Inc.

The VectorCAST products automate and manage the complex tasks associated with testing safety-critical applications. Our customers are developing applications in the avionics, military, medical device, automotive, industrial controls, and railway industries. Applications that must be tested to strict safety standards include: DO-178B, ED-12B, IEC61508, MISRA, FDA/IEC62304, and CENELEC.

[www.vectorcast.com](http://www.vectorcast.com)

[amn@vectorcast.com](mailto:amn@vectorcast.com)

telephone  
trial available  
training available  
address

401.295.5855  
Yes  
Yes  
1130 Ten Rod Rd.  
Ste. F-207  
North Kingstown, RI  
02852



### VMLOGIX LABMANAGER

VMLogix Inc.

VMLogix LabManager helps IT organizations empower development, test, and support teams to build, snapshot, share, and deploy production-like environments on-demand across Citrix, Microsoft, and VMware virtualization platforms. Using advanced automation capabilities, advanced team management, and seamless integration with leading build and test management solutions from HP and IBM, companies can dramatically reduce the manual effort, time, and IT resources required to develop and maintain higher quality software applications.

[www.vmlogix.com/Products/VMLogix-LabManager/](http://www.vmlogix.com/Products/VMLogix-LabManager/)

[sales@vmlogix.com](mailto:sales@vmlogix.com)

telephone  
trial available  
training available  
address

650.451.5555  
Yes  
Yes  
228 Hamilton Ave.  
3rd Floor  
Palo Alto, CA 94301

## MessageMagic

### XML-SIMULATOR

## XML-Simulator

Elvior

Elvior's XML-Simulator is a black box tester for applications using asynchronous XML messaging to communicate with other systems. There are a lot of client-server-based communication protocols that use XML messages to exchange data between the communicating peers. XML-Simulator is a tool that can be used to quickly create a counterpart application simulator for testing your peer application.

[www.xml-simulator.com](http://www.xml-simulator.com)

[elvior@elvior.ee](mailto:elvior@elvior.ee)

telephone  
trial available  
training available  
address

372.667.1737  
Yes  
Yes  
Mustamae tee 44  
Tallinn, Harjumaa  
10621 Estonia





## BugHost

BugHost

Active-X.COM

The most comprehensive and innovative BugHost service now includes all the tools you need to get your project delivered

on-time: High-volume user and project licenses, requirements documents and change requests, individual and project-level task tracking, project management, custom fields, customizable discussion forum, custom reports, file system, test case management, and much more! With so many features, bug tracking, requirements, writing test cases, task tracking, scheduling, and management just got easier.

[www.bughost.com](http://www.bughost.com)

[gregory.alekel@bughost.com](mailto:gregory.alekel@bughost.com)

telephone  
trial available  
training available  
address

503.345.4349  
Yes  
No  
PO Box 3106  
Portland, OR 97208



HP CENTER MANAGEMENT FOR QUALITY CENTER

HP Software & Solutions

HP Center Management for Quality Center software helps your organization manage HP Quality Center software as a shared Center of Excellence. The combination of proven

best practices and HP Project and Portfolio Management software enables your organization to conquer your quality management challenges. You can manage application project lifecycle and quality assurance test phases, resources, and skill sets; automate project and resource management processes; and improve center administration and management.

[www.hp.com/go/software](http://www.hp.com/go/software)

[vw@hp.com](mailto:vw@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



HP TESTDIRECTOR FOR QUALITY CENTER

HP Software & Solutions

HP TestDirector for Quality Center software offers a single, Web-based application that supports all essential aspects of test management. It provides a consistent,

repeatable process for gathering requirements, planning and scheduling tests, analyzing results, and managing defects and issues. This software enables your organization to digitize specific quality processes and procedures within the larger application lifecycle. It also supports high levels of communication and collaboration among your IT team.

[www.hp.com/go/software](http://www.hp.com/go/software)

[vw@hp.com](mailto:vw@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



software™

JAMA CONTOUR

Jama Software

As the #1 Web-based requirements management software, Contour provides a collaborative, easy-to-use solution to help companies build great

software products. With Contour, you don't have to change your process, and you achieve immediate benefits: SPEED—Contour cuts product planning and requirements management cycles in half, ALIGNMENT—Contour keeps your entire team in sync throughout the product development process, QUALITY—Contour helps you reduce costly errors and ensure high quality releases on time.

[www.jamasoftware.com](http://www.jamasoftware.com)

[ewinquist@jamasoftware.com](mailto:ewinquist@jamasoftware.com)

telephone  
trial available  
training available  
address

503.892.2731  
Yes  
Yes  
2828 SW Corbett Ave.  
Ste. 119  
Portland, OR 97201



KOVAIR GLOBAL LIFECYCLE—ENTERPRISE EDITION

Kovair Software, Inc.

Kovair offers a software development lifecycle management solution that comes with out-of-the-box functionalities for requirements, test, change, and help desk management. It allows for the creation of any "user-defined entities" for additional functions in the same application. It contains the industry-leading configurable process engine that can automate any desired process with visual design capabilities. Kovair's Omnibus enables integrations with other vendor tools that create the only multirepository ALM platform today.

[www.kovair.com/products-ented.asp](http://www.kovair.com/products-ented.asp)

[sales@kovair.com](mailto:sales@kovair.com)

telephone  
trial available  
training available  
address

408.262.0200 ext. 2007  
Yes  
Yes  
1533 California Cir.  
Milpitas, CA 95035



# MKS

## MKS INTEGRITY FOR REQUIREMENTS MANAGEMENT

MKS Inc.

MKS Integrity for Requirements Management enables organizations to address the primary causes of software project failures. Built on the foundation of a single ALM platform, MKS Integrity enables organizations to capture and validate software requirements, link them to downstream development and testing activities, and manage their completion through a unified process across the lifecycle. Capabilities for requirements change management and reuse enable the business to improve agility and visibility and reduce software project risk.

[www.mks.com/products/requirements](http://www.mks.com/products/requirements)

[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada



## OPTIMAL TRACE

Compuware Corporation

Compuware Optimal Trace provides requirements capture and management capabilities in a single solution and enables IT and the business to collaborate more effectively. It enables the delivery of high-quality

applications by facilitating the capture of well-defined requirements that can be fully traced through the project lifecycle.

[www.compuware.com/optimaltrace](http://www.compuware.com/optimaltrace)

[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

telephone  
trial available  
training available  
address

800.COMPUWARE  
Yes  
Yes  
One Campus Martius  
Detroit, MI 48226



## QADIRECTOR

Compuware Corporation

Compuware QADirector is a powerful test management solution that gives QA organizations a framework for managing the entire testing process—from design to execution to analysis. It provides appropriate

assignment of testing activities, improved efficiency, and accuracy of deliverables, as well as greater predictability and repeatability.

[www.compuware.com/products/qacenter/qadirector.htm](http://www.compuware.com/products/qacenter/qadirector.htm)

[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

telephone  
trial available  
training available  
address

800.COMPUWARE  
Yes  
Yes  
One Campus Martius  
Detroit, MI 48226



## RALLY COMMUNITY EDITION

Rally Software Development

Rally is the #1 partner for Agile success through products, coaching, and community support. With a dedicated focus on Agile, Rally helps organizations of all sizes shorten development cycles and collaborate across distributed teams and silos.

Rally's on-demand Agile lifecycle management products were honored with three-time Jolt Product Excellence Awards (the industry's Oscars) in 2006, 2007, and 2008 and support 900 customers, 20,000 projects, and 35,000 users in 50 countries. [www.rallydev.com](http://www.rallydev.com)

[www.rallydev.com/?src=stickymindsTG08](http://www.rallydev.com/?src=stickymindsTG08)

[jami.yannett@rallydev.com](mailto:jami.yannett@rallydev.com)

telephone  
trial available  
training available  
address

303.565.2800  
Yes  
Yes  
4001 Discovery Dr.  
Ste. 220  
Boulder, CO 80303



## RALLY ENTERPRISE EDITION

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Rally is the #1 partner for Agile success through products, coaching, and community support. With a dedicated focus on Agile, Rally helps organizations of all sizes shorten development cycles and collaborate across distributed teams and silos.

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[www.rallydev.com/?src=stickymindsTG08](http://www.rallydev.com/?src=stickymindsTG08)

[jami.yannett@rallydev.com](mailto:jami.yannett@rallydev.com)

telephone  
trial available  
training available  
address

303.565.2800  
Yes  
Yes  
4001 Discovery Dr.  
Ste. 220  
Boulder, CO 80303





#### REQUIREMENTS CENTER

##### Blueprint

Blueprint aligns business and IT teams by delivering the industry's first comprehensive workbench designed specifically for the business analyst. Blueprint Requirements Center empowers analyst teams to eliminate requirements misunderstanding by capturing, validating, and delivering precise business requirements to local or distributed IT application project teams. Blueprint's product line functions as a collaborative system for the requirements lifecycle, including requirements elicitation, elaboration, validation, and acceptance.

[www.blueprintsys.com](http://www.blueprintsys.com)  
[nada.tiberio@blueprintsys.com](mailto:nada.tiberio@blueprintsys.com)

telephone  
trial available  
training available  
address

647.288.0732  
Yes  
Yes  
372 Bay St.  
Ste. 1600  
Toronto, Ontario  
M5H 2W9 Canada



#### SILKCENTRAL TEST MANAGER

##### Borland USA

Borland SilkCentral Test Manager is the only solution you need to manage all aspects of the application testing process—from establishing testing requirements aligned with end-user needs and specifications to planning, scheduling, and executing tests in physical or virtual test labs to tracking and resolving issues. You can centrally manage all test types—from development stage unit tests to final user acceptance tests and provide role-based access to all application requirements, specifications, test plans, and quality metrics.

[www.borland.com/us/products/silk/silkcentral\\_test/index.html](http://www.borland.com/us/products/silk/silkcentral_test/index.html)  
[sales@borland.com](mailto:sales@borland.com)

telephone  
trial available  
training available  
address

512.340.2200  
Yes  
Yes  
8310 N. Capital of  
Texas Hwy.  
Building 2, Ste. 100  
Austin, TX 78731



#### SMARTE QUALITY MANAGER

##### SmarteSoft Inc.

Test » Automation » » » Made Easy Instead of having to buy separate requirements capture, bug-tracking, and testing tools, Smarte Quality Manager provides a complete quality assurance and test management solution in one package. It manages your project's requirements, test cases, bugs, and issues in one environment, with full traceability. In addition, Smarte Quality Manager provides reporting dashboards of key project health and status information, like requirements coverage, test case execution, issue summaries, and bug counts, in a simple, consolidated view.

[www.smartesoftware.com](http://www.smartesoftware.com)  
[sales@smartesoftware.com](mailto:sales@smartesoftware.com)

telephone  
trial available  
training available  
address

512.782.9406  
Yes  
Yes  
400 West 15th St.  
Ste. 225  
Austin, TX 78701



Software Planner  
[www.softwareplanner.com](http://www.softwareplanner.com)

#### SOFTWARE PLANNER

##### Pragmatic Software Co., Inc.

Software Planner is an award-winning application lifecycle management tool that helps information technology departments manage all components of software development including managing customer requirements, project deliverables, test cases, defects, and support tickets. Coupled with collaborative tools like document sharing, team calendars, interactive dashboards, knowledge bases, and threaded discussions, teams begin communicating more effectively and begin delivering solutions quickly and with high quality.

[www.softwareplanner.com](http://www.softwareplanner.com)  
[sales@pragmaticsw.com](mailto:sales@pragmaticsw.com)

telephone  
trial available  
training available  
address

800.773.7785  
Yes  
Yes  
383 Inverness Pkwy.  
Ste. 280  
Englewood, CO 80112



#### TARGETPROCESS

##### TargetProcess, Inc.

Founded in 2004, TargetProcess had a vision to pioneer an easy-to-deploy but comprehensive solution that reduces the complexity of software project management. TargetProcess assists software development teams in managing agile development processes, including Scrum, XP, and other agile processes. The company's mission is to simplify the planning, tracking, and quality assurance required by shortened development cycles in agile process development.

[www.targetprocess.com](http://www.targetprocess.com)  
[andrey@targetprocess.com](mailto:andrey@targetprocess.com)

telephone  
trial available  
training available  
address

877.718.2617 ext. 704  
Yes  
Yes  
PO Box 1845  
Amherst, NY 14228





#### TBREQ

LDRA Ltd.

TBreq is a unique solution that can help development teams overcome the challenges of mapping test specifications, unit testing scenarios, test data, and code coverage verification back to their high-level design requirements. TBreq interfaces directly with management tools such as Telelogic DOORS, IBM Rational RequisitePro, Microsoft Word documents, or Excel spreadsheets in order to ensure traceability across the complete software lifecycle thus verifying the completeness of the requirements coverage.

[www.ldra.com/tbreq.asp](http://www.ldra.com/tbreq.asp)

[info@ldra.com](mailto:info@ldra.com)

telephone  
trial available  
training available  
address

44.0.151.649.9300  
Yes  
Yes  
Portside, Monks Ferry  
Wirral, CH41 5LH  
United Kingdom



#### TELELOGIC DOORS

IBM Rational

Telelogic DOORS, the world's leading requirements management solution for advanced systems and software development projects, helps you deliver higher quality systems and software by improving requirements communication, collaboration, and verification across the enterprise. DOORS is a multi-platform system designed to ensure conformance to requirements and compliance to regulations by capturing, linking, analyzing, and managing changes to requirements and their traceability.

[www.telelogic.com/corp/products/doors/index.cfm](http://www.telelogic.com/corp/products/doors/index.cfm)

[info@telelogic.com](mailto:info@telelogic.com)

telephone  
trial available  
training available  
address

877.275.4777  
Yes  
Yes  
9401 Jeronimo Rd.  
Irvine, CA 92618



#### TELELOGIC FOCAL POINT

IBM Rational

Telelogic Focal Point offers the only solution with the unique perspective of improving product value and increasing agility from idea conception through the product lifecycle with a continual focus on customer needs. Focal Point reduces the chaos of managing information in emails, documents, and spreadsheets by providing a collaborative environment for centralizing product information shared by product management, engineering, marketing, and other stakeholders.

[www.telelogic.com/products/focalpoint/](http://www.telelogic.com/products/focalpoint/)

[cransom@us.ibm.com](mailto:cransom@us.ibm.com)

telephone  
trial available  
training available  
address

877.275.4777  
Yes  
Yes  
9401 Jeronimo Rd.  
Ste. 200  
Irvine, CA 92618



#### TESTPARTNER

Compuware Corporation

Compuware TestPartner is an automated testing tool that speeds functional testing of complex applications developed with a range of distributed technologies. It features a visual, storyboard-oriented approach

to capturing business processes that empowers application users to collaborate with quality experts and accomplish more testing in the time available.

[www.compuware.com/testpartner](http://www.compuware.com/testpartner)

[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

telephone  
trial available  
training available  
address

800.COMPUWARE  
Yes  
Yes  
One Campus Martius  
Detroit, MI 48226



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[www.testablerequirements.com](http://www.testablerequirements.com)

[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

telephone  
trial available  
training available  
address

312.819.2220  
No  
Yes  
205 N. Michigan Ave.  
Ste. 2211  
Chicago, IL 60601





**TWIST**

**ThoughtWorks**

Twist is a next-generation collaborative functional testing platform for software teams. It provides a rich environment for authoring, executing, and maintaining tests. Twist is designed to be used by subject matter

experts, QA professionals, and developers, making everyone on a team jointly responsible for software quality. Twist leverages the testing expertise of ThoughtWorks, the creators of the popular Web testing engine Selenium.

[www.thoughtworks.com/twist](http://www.thoughtworks.com/twist)

[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone  
trial available  
training available  
address

512.382.5017  
Yes  
Yes  
1 Market Street  
Spear Tower  
35th Floor  
San Francisco, CA  
94105



**V1: AGILE ENTERPRISE**

**VersionOne**

To help ensure success using Agile methodologies, enter-

prises worldwide have made V1: Agile Enterprise the #1 Agile project management software choice for any type of Agile methodology. V1: Agile Enterprise is an easy-to-use, centralized Agile planning and management system perfect for multi-team, multi-project organizations, as well as experienced Agile teams. With integrated Agile processes and improved alignment between business and IT, V1: Agile Enterprise is the most scalable, flexible, and informative tool on the market.

[www.versionone.com](http://www.versionone.com)

[richard.fuller@versionone.net](mailto:richard.fuller@versionone.net)

telephone  
trial available  
training available  
address

678.268.3320  
Yes  
Yes  
6220 Shiloh Rd.  
Ste. 400  
Alpharetta, GA 30005



**V1: AGILE TEAM**

**VersionOne**

V1: Agile Team combines VersionOne's industry-leading

Agile project management expertise with the needs of smaller teams or teams new to Agile. By focusing on core Agile concepts—team collaboration, continuous planning, and incremental delivery—we've created a streamlined solution that gives teams everything they need to quickly and easily get started with Agile planning, tracking, and reporting. With V1: Agile Team, your team will stay on schedule and deliver software on time.

[www.versionone.com](http://www.versionone.com)

[denise@versionone.com](mailto:denise@versionone.com)

telephone  
trial available  
training available  
address

678.268.3320  
Yes  
Yes  
6220 Shiloh Rd.  
Ste. 400  
Alpharetta, GA 30005



**CODEPRO ANALYTIX**

**Instantiations, Inc.**

CodePro AnalytiX is the premier Java software testing tool for

Eclipse developers who are concerned about improving the quality of their source code. AnalytiX seamlessly integrates into the Eclipse environment. With its powerful features, AnalytiX assists developers with creating high quality code, including static code analysis (with extensive OWASP-based security vulnerability audit rules), powerful reporting and metrics, automated JUnit test generation and JUnit test editor, code coverage analysis, integrated team collaboration, and more.

[www.instantiations.com/codepro/analytix/about.html](http://www.instantiations.com/codepro/analytix/about.html)

[sales@instantiations.com](mailto:sales@instantiations.com)

telephone  
trial available  
training available  
address

503.598.4900  
Yes  
Yes  
18101 SW Boones  
Ferry Rd.  
Ste. 200  
Portland, OR 97224



## Klocwork<sup>®</sup> KLOCWORK DEVELOPER FOR JAVA

Klocwork Inc.

Klocwork Developer for Java (KDJ) takes Klocwork's proven, enterprise-ready, static analysis technology and packages it for the individual Java developer. KDJ provides automated detection of more than 200 security vulnerabilities and quality defects without the need for test cases. Whether the goal is to catch critical code defects before code check in or to ensure code is free of security vulnerabilities, KDJ helps developers produce code that meets corporate objectives for quality and security.

[www.klocwork.com/products/developerJava.asp](http://www.klocwork.com/products/developerJava.asp)

[jim.bush@klocwork.com](mailto:jim.bush@klocwork.com)

telephone	781.685.2910
trial available	Yes
training available	No
address	8 New England Executive Park Ste. 180 Burlington, MA 01803

## Klocwork<sup>®</sup> KLOCWORK INSIGHT

Klocwork Inc.

Klocwork Insight provides powerful, collaborative analysis of C/C++ and Java code. With Klocwork Insight, developers, development organizations, and security specialists can quickly and accurately identify critical security vulnerabilities, quality defects, and architectural issues in their mission-critical code. By eliminating code defects early in the development process, Klocwork Insight helps organizations accelerate development, reduce costs, create a better implementation process, and deliver cleaner, better code.

[www.klocwork.com/products/insight.asp](http://www.klocwork.com/products/insight.asp)

[jim.bush@klocwork.com](mailto:jim.bush@klocwork.com)

telephone	781.685.2910
trial available	Yes
training available	Yes
address	8 New England Executive Park Ste. 180 Burlington, MA 01803

## McCabe<sup>®</sup> IQ<sup>®</sup> McCABE IQ

McCabe Software

The McCabe IQ suite is made up of three multi-platform, multi-language software quality management solutions. McCabe IQ Developers Edition visualizes the complexity of source code and provides a host of metrics with which to measure quality. McCabe IQ Test Team Edition identifies precisely what areas of code have been tested and facilitates improved test plans. McCabe Enterprise Edition provides all the functionality of the Developers and Test Team Editions, in addition to enterprise reporting and Web-enabled test data collection.

[www.mccabe.com/iq.htm](http://www.mccabe.com/iq.htm)

[sales@mccabe.com](mailto:sales@mccabe.com)

telephone	401.572.3100
trial available	Yes
training available	Yes
address	41 Sharpe Dr. Cranston, RI 02920

PARASOFT<sup>®</sup>

Jtest<sup>®</sup>

A Parasoft AEP Technology™

PARASOFT JTEST

Parasoft Corporation

Parasoft Jtest is a comprehensive Java testing product for development teams building Java EE, SOA, Web, and other Java applications. Whether a team is trying to build quality into new code or extend a legacy code base without breaking existing functionality, Jtest provides them a practical way to ensure that their Java code works as expected. It empowers them to modify their code quickly and with confidence, resulting in optimization of development resources and control of development schedules and costs.

[www.parasoft.com/jtest](http://www.parasoft.com/jtest)

[info@parasoft.com](mailto:info@parasoft.com)

telephone	888.305.0041
trial available	Yes
training available	Yes
address	101 E. Huntington Dr. 2nd Floor Monrovia, CA 91016

PARASOFT<sup>®</sup>

SOAtest<sup>™</sup>

A Parasoft AEP Technology™

PARASOFT SOATEST

Parasoft Corporation

Parasoft SOAtest is a comprehensive, collaborative test and analysis tool suite designed specifically for test and validation of service-oriented architectures (SOA). Parasoft SOAtest streamlines the process of rapidly constructing robust regression suites. It features the following major benefits: delivers a "quality" process not solely dependent on QA, makes SOA quality assets valuable to the entire organization, drives SOA consistency, rapidly generates and manages robust regression suites, saves time, and ensures project success.

[parasoft.com/soatest](http://parasoft.com/soatest)

[info@parasoft.com](mailto:info@parasoft.com)

telephone	888.305.0041
trial available	Yes
training available	Yes
address	101 E. Huntington Dr. 2nd Floor Monrovia, CA 91016



## AQtime

eliminate leaks and bottlenecks

### AQTIME

#### AutomatedQA

AQtime is a performance profiler and memory debugger engineered to give

developers unparalleled insight into all aspects of the performance of their applications. AQtime provides a single solution for detecting performance bottlenecks and memory leaks within managed, unmanaged, and mixed-code applications. AQtime supports Microsoft Visual Studio, .NET, ASP.NET, C++, VB, Delphi, 32-bit, 64-bit, and more.

[www.automatedqa.com/products/aqnet.asp](http://www.automatedqa.com/products/aqnet.asp)

[sales@automatedqa.com](mailto:sales@automatedqa.com)

telephone  
trial available  
training available  
address

978.236.7900  
Yes  
Yes  
100 Cummings Center  
Ste. 420B  
Beverly, MA 01915

## Automated Build Studio

simplify your deployment

### AUTOMATED BUILD STUDIO

#### AutomatedQA

Automated Build Studio is a release management system that provides an easy and visual way to automate the software development build and deployment process. Users easily create visual macros by dragging and dropping pre-built operations. More than 500 built-in operations are available in a variety of categories.

[www.automatedqa.com/products/abs.asp](http://www.automatedqa.com/products/abs.asp)

[sales@automatedqa.com](mailto:sales@automatedqa.com)

telephone  
trial available  
training available  
address

978.236.7900  
Yes  
Yes  
100 Cummings Center  
Ste. 420B  
Beverly, MA 01915



### CODE COLLABORATOR

#### Smart Bear Inc.

Code Collaborator enables peer review of source code changes before or after files are checked into version control. Automate audit trails, enforce workflow, and generate reports. Works equally well for on-site and off-shore inspections.

Integrates with SCM, issue-tracking, reporting, and other external systems.

[codecollaborator.com](http://codecollaborator.com)

[info@codecollaborator.com](mailto:info@codecollaborator.com)

telephone  
trial available  
training available  
address

512.257.1569  
Yes  
Yes  
12885 Research Blvd.  
Ste. 210  
Austin, TX 78750



### CODEPRO ANALYTIX

#### Instantiations, Inc.

CodePro AnalytiX is the premier Java software testing tool for

Eclipse developers who are concerned about improving the quality of their source code. AnalytiX seamlessly integrates into the Eclipse environment. With its powerful features, AnalytiX assists developers with creating high quality code, including static code analysis (with extensive OWASP-based security vulnerability audit rules), powerful reporting and metrics, automated JUnit test generation and JUnit test editor, code coverage analysis, integrated team collaboration, and more.

[www.instantiations.com/codepro/analytix/about.html](http://www.instantiations.com/codepro/analytix/about.html)

[sales@instantiations.com](mailto:sales@instantiations.com)

telephone  
trial available  
training available  
address

503.598.4900  
Yes  
Yes  
18101 SW Boones  
Ferry Rd.  
Ste. 200  
Portland, OR 97224



### CODEPRO PROFILER

#### Instantiations, Inc.

CodePro Profiler is an Eclipse-based software development product

that enables Java developers to easily find performance problems early in the development cycle and automatically locate performance bottlenecks, memory leaks, and threading issues. CodePro Profiler offers highly accurate profiling with nearly zero overhead and on-demand profiling with powerful telemetry reporting. CodePro Profiler seamlessly integrates into the Eclipse development process and includes extensive best practices documentation and optimization guides.

[www.instantiations.com/codepro/profiler](http://www.instantiations.com/codepro/profiler)

[sales@instantiations.com](mailto:sales@instantiations.com)

telephone  
trial available  
training available  
address

503.598.4900  
Yes  
Yes  
18101 SW Boones  
Ferry Rd.  
Ste. 200  
Portland, OR 97224





#### CRUISE

##### ThoughtWorks

Cruise is a continuous integration and release management system that enables software teams to go live with new, tested features quickly and repeatably. By lowering the effort and risk

associated with releasing complex applications, Cruise leaves your team free to focus on the stuff that really matters—delivering value through innovation. Cruise draws from the extensive continuous integration experience of ThoughtWorks, the creators of the original CruiseControl.

[www.thoughtworks.com/studios](http://www.thoughtworks.com/studios)

[studios@thoughtworks.com](mailto:studios@thoughtworks.com)

telephone  
trial available  
training available  
address

512.382.5017  
Yes  
Yes  
1 Market St.  
Spear Tower  
35th Floor  
San Francisco, CA  
94105



#### DEVTEST

##### TechExcel, Inc.

DevTest is a development-tracking tool that helps to ensure that quality products are developed and delivered on time and on budget by modeling business processes and aligning development with knowledge. Integrations with popular version control tools allow for items to be tracked with related source code.

[www.techexcel.com/products/devtest.html](http://www.techexcel.com/products/devtest.html)

[sales@techexcel.com](mailto:sales@techexcel.com)

telephone  
trial available  
training available  
address

800.439.7782 ext. 5  
Yes  
Yes  
3675 Mt. Diablo Blvd.  
Ste. 200  
Lafayette, CA 94549



#### DSTAR

##### Mosaic, Inc.

DSTAR is an ODBC-compliant Quality Center add-on that manages the test data required for manual and automated testing. It tracks and maintains test data assignments for reusable tests in Quality Center. DSTAR controls and maintains data extracted from databases or created externally. Through integration with Quality Center, DSTAR allows test data assignments to be maintained as late as test execution time and then provides the data for test execution. DSTAR includes an integrated test automation framework and management reporting.

[www.mosaicinc.com](http://www.mosaicinc.com)

[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

telephone  
trial available  
training available  
address

312.819.2220  
No  
Yes  
205 N. Michigan Ave.  
Ste. 2211  
Chicago, IL 60601



#### EVALID

##### Software Research, Inc.

The eValid suite supports all your automation requirements for the quality, reliability, and performance of your Web-based applications: GUI interaction, test data creation, functional and regression testing, load generation, and monitoring capability of your server. One system does it all. It is easy to use and is cost effective. Tests generated for regression can be reused for server loading or monitoring—all with easy point and click. eValid is optimized for testing every kind of live Web application—e-commerce, Ajax, and Web 2.0.

[www.e-valid.com/quick.summary.html](http://www.e-valid.com/quick.summary.html)

[ritabral@soft.com](mailto:ritabral@soft.com)

telephone  
trial available  
training available  
address

415.861.2800  
Yes  
Yes  
1663 Mission St.  
Ste. 400  
San Francisco, CA  
94103



#### HP BUSINESS PROCESS TESTING

##### HP Software & Solutions

HP Business Process Testing software is a Web-based test design solution that bridges the quality chasm between subject matter experts and quality engineers. This role-based system enables subject matter experts to build, data-drive, and execute manual and automated tests without any programming knowledge. It reduces the overhead required to test maintenance and combines test automation and documentation into a single effort.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014





#### ® HP CENTER MANAGEMENT FOR PERFORMANCE CENTER

##### HP Software & Solutions

HP Center Management for Performance Center software enables you to deploy a successful testing Center of Excellence. This out-of-the-box demand, project, and resource management solution provides consistency, control, and visibility across your testing activities. It enables your IT organization to leverage common solutions, methodologies, and templates in a way that greatly improves your performance testing process.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



#### ® HP DIAGNOSTICS

##### HP Software & Solutions

HP Diagnostics helps you improve application availability and performance in pre-production and production environments. You can drill down from the end-user into application components and cross-platform service calls to resolve the toughest problems. This includes slow services, methods, SQL, out-of-memory errors, threading problems, and more.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



#### ® HP LOADRUNNER

##### HP Software & Solutions

HP LoadRunner can help you prevent costly performance problems in production by detecting bottlenecks before a new system or upgrade is deployed. This software enables you to measure end-to-end performance, diagnose application and system bottlenecks, and tune for better performance—all from a single point of control. This helps reduce the costs and time required to test and deploy new applications and systems into your production environment.

[www.hp.com/go/software](http://www.hp.com/go/software)

[judy.perez@hp.com](mailto:judy.perez@hp.com)

telephone  
trial available  
training available  
address

408.725.8900  
Yes  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



#### ® HP SERVICE TEST

##### HP Software & Solutions

HP Service Test software is a SOA testing solution that simplifies and accelerates the automated functional testing of SOA services. It reduces the time required to test SOA services and helps ensure that these services meet your business requirements prior to deployment. HP Service Test software enables your organization to simplify your testing processes and minimize the need for scripting by automating capabilities.

[www.hp.com/go/software](http://www.hp.com/go/software)

[vw@hp.com](mailto:vw@hp.com)

telephone  
trial available  
training available  
address

408.447.0181  
No  
Yes  
19091 Pruneridge Ave.  
Cupertino, CA 95014



#### JPROBE

##### Quest Software

JProbe is an enterprise-class Java profiler providing intelligent diagnostics on memory usage, performance, and test coverage, allowing developers to quickly pinpoint and repair the root cause of application code performance and stability problems that obstruct component and integration integrity. JProbe offers an Eclipse plug-in that provides intelligent code performance analysis and problem resolution directly within the Eclipse Java IDE.

[www.quest.com/jprobe/software-downloads.aspx](http://www.quest.com/jprobe/software-downloads.aspx)

[info@quest.com](mailto:info@quest.com)

telephone  
trial available  
training available  
address

949.754.8000  
Yes  
Yes  
5 Polaris Way  
Aliso Viejo, CA 92656



## KOVAIR Global Lifecycle™

KOVAIR GLOBAL LIFECYCLE—ENTERPRISE EDITION

Kovair Software, Inc.

Kovair offers a software development lifecycle management solution that comes with out-of-the-box functionalities for requirements, test, change, and help desk management. It allows for the creation of any “user-defined entities” for additional functions in the same application. It contains the industry-leading configurable process engine that can automate any desired process with visual design capabilities. Kovair’s Omnibus enables integrations with other vendor tools that create the only multirepository ALM platform today.

[www.kovair.com/products-ented.asp](http://www.kovair.com/products-ented.asp)

[sales@kovair.com](mailto:sales@kovair.com)

telephone  
trial available  
training available  
address

408.262.0200 ext. 2007  
Yes  
Yes  
1533 California Cir.  
Milpitas, CA 95035



LDRA TESTBED

LDRA Ltd.

LDRA Testbed is a static analysis and code coverage tool for C, C++, Ada83/Ada95, and Assembler (Intel, Freescale, Texas Instruments).

Static analysis features include code visualization, programming standards checking, and complexity metrics. Code coverage is available for different coverage levels including MC/DC level A for the D0-178B standard, regression testing, and is available for any host/target environment.

[www.ldra.com/testbed.asp](http://www.ldra.com/testbed.asp)

[info@ldra.com](mailto:info@ldra.com)

telephone  
trial available  
training available  
address

44.0.151.649.9300  
Yes  
Yes  
Portside, Monks Ferry  
Wirral, CH41 5LH  
United Kingdom



LISA SOA TESTING, VALIDATION & VIRTUALIZATION SUITE

iTKO, Inc.

iTKO’s LISA SOA Testing, Validation & Virtualization suite provides a complete, collaborative, and continuous environment across every phase of software development and deployment. LISA’s no-code environment automates SOA unit, functional, regression, and load test creation and execution—from rich Web apps to middle-tier technologies such as Web services, ESB messaging, databases, mainframes, and more. LISA’s extensibility and virtualization of SOA behaviors eliminate dependencies in the lifecycle while increasing team agility.

[www.itko.com/site/products/index.jsp](http://www.itko.com/site/products/index.jsp)

[info@itko.com](mailto:info@itko.com)

telephone  
trial available  
training available  
address

877.BUY.ITKO  
Yes  
Yes  
1505 LBJ Fwy.  
Ste. 250  
Dallas, TX 75234



McCABE IQ

McCabe Software

The McCabe IQ suite is made up of three multi-platform, multi-language software quality management solutions. McCabe IQ Developers Edition visualizes the complexity of source code and provides a host of metrics with which to measure quality. McCabe IQ Test Team Edition identifies precisely what areas of code have been tested and facilitates improved test plans. McCabe Enterprise Edition provides all the functionality of the Developers and Test Team Editions, in addition to enterprise reporting and Web-enabled test data collection.

[www.mccabe.com/iq.htm](http://www.mccabe.com/iq.htm)

[sales@mccabe.com](mailto:sales@mccabe.com)

telephone  
trial available  
training available  
address

401.572.3100  
Yes  
Yes  
41 Sharpe Dr.  
Cranston, RI 02920

## MessageMagic

MESSAGEMAGIC

## XML-Simulator

Elvior

MessageMagic is ideal for incremental software development. It supports black box testing of an individual task or process, subsystems integration tests, and SW/HW integration tests. MessageMagic contains text-based TTCN-3 editor, compiler, and debugger. It supports TTCN-3 TCI and TRI interfaces. The user-friendly GUI allows users to develop, execute, and analyze test suites efficiently. MessageMagic simplifies and accelerates product development—with all the benefits that derive from shorter development cycles.

[messagemagic.elvior.ee](http://messagemagic.elvior.ee)

[andres.kull@elvior.ee](mailto:andres.kull@elvior.ee)

telephone  
trial available  
training available  
address

372.667.1737  
Yes  
Yes  
Mustamae tee 44  
Tallinn, Harjumaa  
10621 Estonia



# MKS

## MKS INTEGRITY FOR TEST MANAGEMENT

MKS Inc.

MKS Integrity helps software QA organizations manage the software application testing process. With its unique change and configuration management approach, MKS Integrity captures software test plans, triggers test case development and execution, logs test results and corresponding software defects, and directly links them to requirements, providing a closed loop of coverage and traceability across the application. Change management ensures complete testing coverage and increases agility with unique capabilities for reuse of test artifacts.

[www.mks.com/products/test](http://www.mks.com/products/test)  
[sales@mks.com](mailto:sales@mks.com)

telephone  
trial available  
training available  
address

519.884.2251  
No  
Yes  
410 Albert St.  
Waterloo, Ontario  
N2L 3V3 Canada

# TechSmith MORAE

## MORAE

TechSmith Corporation

Morae is the premier software for deeply understanding customer experiences—and sharing those insights clearly and powerfully.

Use Morae to record exactly what customers do and say, discover patterns in the data, key in on significant moments, and build a compelling case for how to improve the customer experience. From usability testing to focus groups and beyond, Morae helps you transform designs and marketing to make things people love.

[www.techsmith.com/morae.asp](http://www.techsmith.com/morae.asp)  
[www.techsmith.com/sales](http://www.techsmith.com/sales)

telephone  
trial available  
training available  
address

517.381.2300  
Yes  
Yes  
2405 Woodlake Dr.  
Okemos, MI 48864



## MSTAR

Mosaic, Inc.

This intranet-ready repository provides complete field-proven guidelines, templates, and samples for a risk-based and measurable testing process. MSTAR also enables successful test automation with a tool-independent automation architecture proven to reduce maintenance and resource costs while dramatically improving long-term benefits. MSTAR includes complete guidelines for reusable test planning and test data management. It covers all test levels including performance testing.

[www.mosaicinc.com/mosaicinc/mstar.asp](http://www.mosaicinc.com/mosaicinc/mstar.asp)  
[kjohns@mosaicinc.com](mailto:kjohns@mosaicinc.com)

telephone  
trial available  
training available  
address

312.819.2220  
No  
Yes  
205 N. Michigan Ave.  
Ste. 2211  
Chicago, IL 60601



## OPTIMAL TRACE

Compuware Corporation

Compuware Optimal Trace provides requirements capture and management capabilities in a single solution and enables IT and the business to collaborate more effectively. It enables the delivery of high-quality

applications by facilitating the capture of well-defined requirements that can be fully traced through the project lifecycle.

[www.compuware.com/optimaltrace](http://www.compuware.com/optimaltrace)  
[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

telephone  
trial available  
training available  
address

800.COMPUWARE  
Yes  
Yes  
One Campus Martius  
Detroit, MI 48226

# ORACLE®

## ORACLE FUNCTIONAL TESTING FOR WEB APPLICATIONS

Oracle

Oracle Functional Testing for Web Applications is an easy-to-use functional and regression testing tool that allows you to automate your testing processes. Oracle Functional Testing for Web Applications is a component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)  
[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

telephone  
trial available  
training available  
address

800.ORACLE1  
Yes  
Yes  
500 Oracle Pkwy.  
Redwood Shores, CA  
94065



## ORACLE® ORACLE LOAD TESTING FOR WEB APPLICATIONS

Oracle

Oracle Load Testing for Web Applications not only stresses your application to simulate the impact of end-user workloads but it also enables rigorous validation that protocol-based legacy client server testing tools cannot provide. Oracle Load Testing for Web Applications is a component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)  
[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

telephone	800.ORACLE1
trial available	Yes
training available	Yes
address	500 Oracle Pkwy. Redwood Shores, CA 94065

## ORACLE® ORACLE TEST MANAGER FOR WEB APPLICATIONS

Oracle

Oracle Test Manager for Web Applications is a flexible, easy-to-use test process management solution on which you can build and organize your entire testing process. Oracle Test Manager for Web Applications is a key component of Oracle Application Testing Suite, the centerpiece of the Oracle Enterprise Manager solution for comprehensive testing of packaged, Web, and service-oriented architecture-based applications.

[www.oracle.com/enterprise\\_manager/applications-management-packs.html](http://www.oracle.com/enterprise_manager/applications-management-packs.html)  
[robert.wickham@oracle.com](mailto:robert.wickham@oracle.com)

telephone	800.ORACLE1
trial available	Yes
training available	Yes
address	500 Oracle Pkwy. Redwood Shores, CA 94065



### PARASOFT JTEST

Parasoft Corporation

Parasoft Jtest is a comprehensive Java testing product for development teams building Java EE, SOA, Web, and other Java applications. Whether a team is trying to build quality into new code or extend a legacy code base without breaking existing functionality, Jtest provides them a practical way to ensure that their Java code works as expected. It empowers them to modify their code quickly and with confidence, resulting in optimization of development resources and control of development schedules and costs.

[www.parasoft.com/jtest](http://www.parasoft.com/jtest)  
[info@parasoft.com](mailto:info@parasoft.com)

telephone	888.305.0041
trial available	Yes
training available	Yes
address	101 E. Huntington Dr. 2nd Floor Monrovia, CA 91016



### PARASOFT SOATEST

Parasoft Corporation

Parasoft SOAtest is a comprehensive, collaborative test and analysis tool suite designed specifically for test and validation of service-oriented architectures (SOA). Parasoft SOAtest streamlines the process of rapidly constructing robust regression suites. It features the following major benefits: delivers a "quality" process not solely dependent on QA, makes SOA quality assets valuable to the entire organization, drives SOA consistency, rapidly generates and manages robust regression suites, saves time, and ensures project success.

[parasoft.com/soatest](http://parasoft.com/soatest)  
[info@parasoft.com](mailto:info@parasoft.com)

telephone	888.305.0041
trial available	Yes
training available	Yes
address	101 E. Huntington Dr. 2nd Floor Monrovia, CA 91016



### QADIRECTOR

Compuware Corporation

Compuware QADirector is a powerful test management solution that gives QA organizations a framework for managing the entire testing process—from design to execution to analysis. It provides appropriate assignment of testing activities, improved efficiency, and accuracy of deliverables, as well as greater predictability and repeatability.

[www.compuware.com/products/qacenter/qadirector.htm](http://www.compuware.com/products/qacenter/qadirector.htm)  
[mitzi.hunter@compuware.com](mailto:mitzi.hunter@compuware.com)

telephone	800.COMPUWARE
trial available	Yes
training available	Yes
address	One Campus Martius Detroit, MI 48226



**QA WIZARD PRO**

Seapine Software

QA Wizard Pro automates the functional and regression

testing of Web and Windows applications. Featuring a next-generation scripting language and an easy-to-use Grid View, QA Wizard Pro includes advanced object searching, a global application repository, data-driven testing support, validation checkpoints, and built-in debugging. It also includes batch file support, a real-time status tool, and remote execution support. Focus on what you want to test—instead of how to test it—with Seapine QA Wizard Pro.

[www.seapine.com/qawizard.html](http://www.seapine.com/qawizard.html)
[sales@seapine.com](mailto:sales@seapine.com)

 telephone  
trial available  
training available  
address

 513.754.1655  
Yes  
Yes  
5412 Courseview Dr.  
Ste. 200  
Mason, OH 45040
**RANOREX GUI TEST AUTOMATION FRAMEWORK**

Ranorex

Ranorex is a cost-effective and comprehensive GUI test automation

framework for developers and testers regardless of their programming or scripting experience. Ranorex supports testing of .NET, VB, Adobe Flash/Flex, Delphi, Java, and Web applications, using common languages such as C#, VB.NET, or Python. In addition, an object-based Capture/Replay editor enhances the generation of reusable test automation recordings.

[www.ranorex.com](http://www.ranorex.com)
[info@ranorex.com](mailto:info@ranorex.com)

 telephone  
trial available  
training available  
address

 43.316.28.13.28  
Yes  
Yes  
Strassgangerstr. 289  
Graz, Steiermark  
8054 Austria
**REQUIREMENTS CENTER**

Blueprint

Blueprint aligns business and IT teams by delivering the industry's first comprehensive workbench designed specifically for the busi-

ness analyst. Blueprint Requirements Center empowers analyst teams to eliminate requirements misunderstanding by capturing, validating, and delivering precise business requirements to local or distributed IT application project teams. Blueprint's product line functions as a collaborative system for the requirements lifecycle, including requirements elicitation, elaboration, validation, and acceptance.

[www.blueprintsys.com](http://www.blueprintsys.com)
[nada.tiberio@blueprintsys.com](mailto:nada.tiberio@blueprintsys.com)

 telephone  
trial available  
training available  
address

 647.288.0732  
Yes  
Yes  
372 Bay St.  
Ste. 1600  
Toronto, Ontario  
M5H 2W9 Canada
**SILKCENTRAL TEST MANAGER**

Borland USA

Borland SilkCentral Test Manager is the only solution you need to manage all aspects of the application testing process—from establishing testing

requirements aligned with end-user needs and specifications to planning, scheduling, and executing tests in physical or virtual test labs to tracking and resolving issues. You can centrally manage all test types—from development stage unit tests to final user acceptance tests and provide role-based access to all application requirements, specifications, test plans, and quality metrics.

[www.borland.com/us/products/silk/silkcentral\\_test/index.html](http://www.borland.com/us/products/silk/silkcentral_test/index.html)
[sales@borland.com](mailto:sales@borland.com)

 telephone  
trial available  
training available  
address

 512.340.2200  
Yes  
Yes  
8310 N. Capital of  
Texas Hwy.  
Building 2, Ste. 100  
Austin, TX 78731
**SILKPERFORMER**

Borland USA

Borland SilkPerformer offers a cost-effective, enterprise-class tool for software application performance and load testing, delivering automated

software load, stress, and performance testing in an open and sharable model. With SilkPerformer, you can create powerful, realistic load tests for thousands of users running business scenarios across a broad range of enterprise application environments to identify bottlenecks and then apply powerful diagnostics to resolve performance issues.

[www.borland.com/us/products/silk/silkperformer/index.html](http://www.borland.com/us/products/silk/silkperformer/index.html)
[sales@borland.com](mailto:sales@borland.com)

 telephone  
trial available  
training available  
address

 512.340.2200  
Yes  
Yes  
8310 N. Capital of  
Texas Hwy.  
Building 2, Ste. 100  
Austin, TX 78731



## Borland®

SILKTEST

Borland USA

THE OPEN ALM COMPANY

Borland SilkTest is the proven choice of QA professionals for powerful functional and regression test automation. Intuitive GUI record-and-play capabilities—coupled with a stable, easy-to-use testing language—enable you to build functional and regression tests that do not break with minor changes to the application, a problem that makes most functional testing tools too costly to implement. SilkTest delivers time-tested stability and support for major enterprise environments in a cost-effective package.

[www.borland.com/us/products/silk/silktest/index.html](http://www.borland.com/us/products/silk/silktest/index.html)

[sales@borland.com](mailto:sales@borland.com)

telephone	512.340.2200
trial available	Yes
training available	Yes
address	8310 N. Capital of Texas Hwy. Building 2, Ste.100 Austin, TX 78731

## Skytap™

GO VIRTUAL

SKYTAP VIRTUAL LAB

Skytap, Inc.

Skytap Virtual Lab is a hosted, on-demand service for virtual lab automation and management. It enables QA professionals to rapidly build and configure test, training, and demo lab environments using pre-configured virtual machines in the Skytap Library; get access to hardware, storage, and networking resources on demand using just a browser; and collaborate with other team members in a virtual environment, wherever they are in the world.

[www.skytap.com/products/virtual-lab-overview](http://www.skytap.com/products/virtual-lab-overview)

[alexb@skytap.com](mailto:alexb@skytap.com)

telephone	888.SKYTAP8
trial available	Yes
training available	Yes
address	614 1st Ave. Ste. 200 Seattle, WA 98104

## SmarteLoad™

Test ▶ Automation ▶▶▶ Made Easy

SMARTELOAD

SmarteSoft Inc.

SmarteLoad is the industry's first true-automation load testing tool that does not require any programming. It tests applications and infrastructure to any desired load or performance level, so you can find out immediately where the limits of performance are. SmarteLoad lets you address bottlenecks, optimize performance, and set traffic limits that you know will work, before your software goes live.

[www.smartesoftware.com/products\\_smartescrpt.php](http://www.smartesoftware.com/products_smartescrpt.php)

[sales@smartesoftware.com](mailto:sales@smartesoftware.com)

telephone	512.782.9406
trial available	Yes
training available	Yes
address	400 W. 15th St. Ste. 225 Austin, TX 78701

## SmarteQM™

Test ▶ Automation ▶▶▶ Made Easy

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# *The Kanban Primer*

*A Cultural Evolution  
in Software*

*by David J. Anderson*





**K**anban, a Japanese word meaning “signal card,” introduces a new way to think about software development. A kanban system is a mechanism that uses signaling to indicate when to allow work to flow through a system to the next stage (aka pull.) Physical kanban systems, using a finite number of plastic cards as signaling tokens, are in wide use in manufacturing. However, the technique is not limited to manufacturing. Even crowd control at the Imperial Palace Gardens in Tokyo is controlled with a kanban system. Tourists are given a plastic card when entering through one of the two main gates to the gardens. On exiting, they return the card to a kiosk. Cards are recycled to guests waiting to enter the gardens. The number of cards in circulation is finite, limiting the number of people inside the palace grounds. But kanban signals do not need to be based on passing physical cards; any virtual signaling mechanism will do equally well.

The key elements of a kanban system are that there is a limit set on work in progress (WIP), signal tokens are created to represent that work, the number of tokens represents the limit, and the signals are used to pull work through the system. The result is a system that is never overloaded.

### Kanban on Software Projects

Kanban implements a value-stream-based, single-piece flow and a delivery cadence paradigm (see the Lean Terminology sidebar) that is very different from the traditional project-management paradigm of scope, schedule, dedicated resource pool, and delivery date. It does away with fixed-length iterations, estimation is discouraged or eliminated, and planning is minimal and undertaken only on individual items at the last responsible moment.

For example, figure 1 shows a white board mapping the value stream (left to right) for the software maintenance activity. Change requests are first analyzed by system analysts who develop a functional specification; this is handed off to developers who design, code, and unit test a solution. The new code is then integrated into the enterprise code base by a build engineer and the integrated code

is tested by a separate quality assurance team. Finally, the code is labeled for deployment, queued, and scheduled for a release. A cross-functional team coordinates and performs releases on a regular basis.

You don’t necessarily need to use a physical white board. On the Microsoft XIT project discussed in “Evolution of the Kanban Meme” in this issue’s Sticky-Notes, we used an electronic implementation for kanban signaling. However, there are benefits to using a physical white board—the most valuable being the visual control element that enables team members to self-organize.

### Lean Terminology

**Value stream:** This is a workflow that spans all the steps and activities from ideation through to delivery and realization of value.

**Single-piece flow:** Work moves through the value stream in single units rather than collected in batches.

**Delivery cadence (also known as Takt time):** This is the rate of delivery to the customer. In a manufacturing context it is usually measured in seconds (for example, a Toyota Corolla rolls off the assembly line every ninety-seven seconds). In a software engineering context, this could be every two weeks.



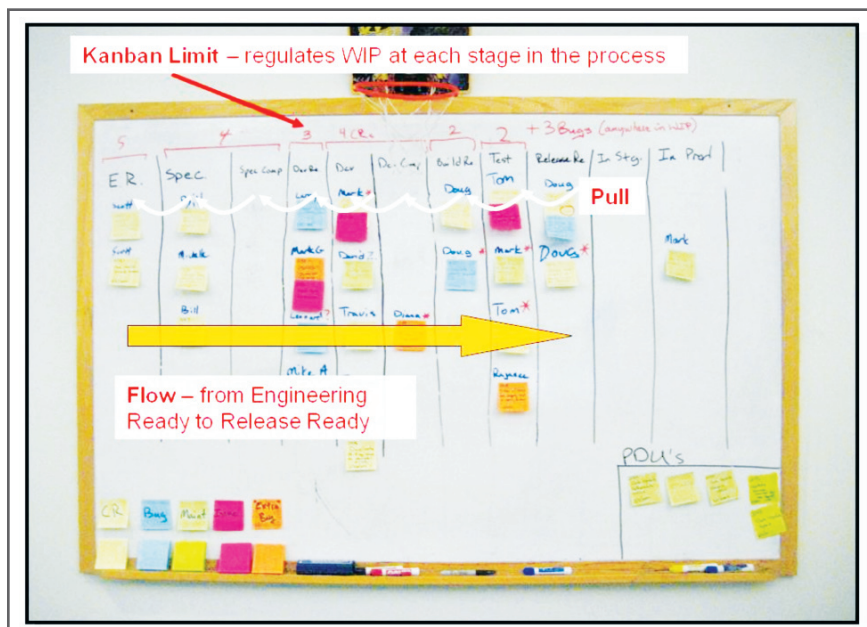


Figure 1: A kanban board showing work flow, WIP limits, and pull

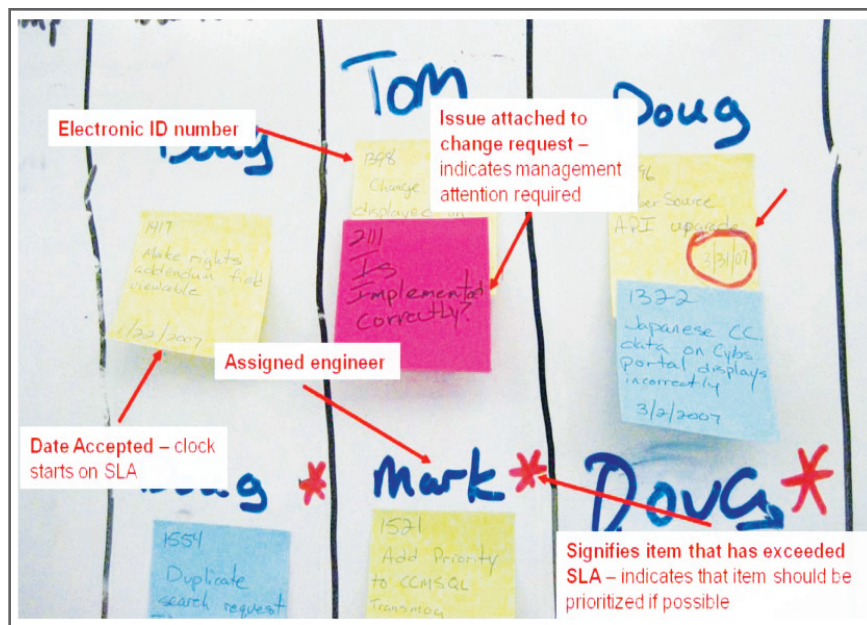


Figure 2: Anatomy of a kanban board showing details of work item tickets

## Some Common Misconceptions

In order for a process to be a true kanban system, there must be a WIP limit and the system must pull work on demand. Some have suggested that on a typical agile development project, any white board covered in sticky notes representing WIP is a kanban system [1,2]. However, the white board and its sticky notes are primarily a visual presentation mechanism. The sticky notes are actually not the kanban tokens. Figure 1 shows the kanban signal is derived from the

sticky notes sitting in each column subtracted from the WIP limit shown in red across the top of the columns.

In order to recognize or implement kanban, it's important to understand some of the key concepts behind it.

## ITERATIVE DEVELOPMENT WITHOUT "ITERATIONS"

Kanban innovates on traditional agile methods by freeing you from the tyranny of fitting work into timeboxed iterations. Many teams struggle to break work down to small enough chunks to

complete within a two-week timebox. The typical reaction to this is to increase the iteration length or totally abandon timeboxed iterations as a project management strategy. Both of these "solutions" are bad, because both increase the amount of WIP, reducing responsiveness and business agility and often adversely affect quality.

## THE CADENCE OF DELIVERY AND PRIORITIZATION ARE INDEPENDENT

Kanban decouples the prioritization (input to the system) from delivery (output). Work in a kanban system can take many weeks to process. For example, if the release cadence is set as every two weeks, then the important thing to realize is that this does not imply that work must be completed within two weeks. Only items queuing for release will be released. All other WIP will continue to work its way through the system for delivery in a future release. Think of this like a train schedule. The train is scheduled to leave the station every two weeks. Only completed items are allowed to queue on the station platform and board the train. Some statistical outliers I've seen took up to 160 days. However, releases continued to happen every two weeks.

There are proven relationships between quality and WIP. Observing teams I have run directly, the magic number for iteration length seems to be around two weeks. For example, with teams using the Feature-Driven Development method, I noticed that initial quality (measured as defects escaping into system test per feature) degraded non-linearly for batches of features that took longer than two weeks to complete. A 6.5 times growth in batch size (and iteration length) caused a greater than 30 times increase in initial defects.

## NO ESTIMATION

Through my years of experience managing software development teams, I've found that estimating the time for a task or the size of the work is not a particularly useful function. Rather than spend time estimating the level of effort involved and subsequently tracking the effort expended for comparison, it's better to have an analysis method that



helps to break down work into relatively similar-sized chunks, narrowing the variability in the cycle time for each item. I've found it more constructive to replace estimation and commitment against an estimate with a different kind of promise—a promise to the customer that resembles a service level agreement (SLA). Offer to complete work within a given time from acceptance to delivery. This SLA doesn't need to be a heavyweight contractual obligation; it's just a strong indication of the expected turnaround time for regular requests. Base the SLA period on a normal band of processing time for work items with a regular class of service. For example, if you believe that you can process most things in six weeks total, then make the cycle time promise forty-two days. Set achieving this cycle time as the goal for the team. Allow the team to self-manage its work by observing progress of work items against promised cycle time using visual control, as shown in figure 2, and pull items through the system as required to optimize the performance against the promised cycle time.

## Managing Policies, Expediting, and Fixed Delivery Dates

A good kanban system will allow for several classes of service. A class of service defines how something is treated while it is in progress. "Regular service" might imply First-In-First-out queuing, no fixed delivery date, commitment to a specific release to be deferred until five days prior to release, and that the item is pulled only when an earlier item is completed. However, it may be necessary to provide some alternative classes of service. In manufacturing it is normal to provide an expedite class of service for urgent customer requests that have a very high value.

In lean value trumps flow and flow trumps waste elimination [3]. Hence, it is desirable to accept a very valuable request and give it priority even if it affects flow through the system and increases waste (such as queue sizes). Expediting is known to increase WIP, affect flow, decrease throughput of items completed, and increase lead times. However, if the value of expedite requests is great

enough, we should accept them into the system. An expedite request would typically be hand carried by a project manager through the system. It will jump to the head of each queue. Other work may be shelved in order to process the expedite request immediately.

Many combinations of policies are possible, and a typical kanban system might offer five or six classes of service. In figures 1 and 2, different classes of service are represented by different colors of sticky note.

## Planning

Given that we have replaced task estimation with an analysis approach that reduces variability in terms of times, we can greatly simplify planning to focus on maximizing value delivered through the system. All that is required is an understanding of the value of items being scheduled and whether or not they have fixed delivery dates. Another way to think about value is captured in the lean concept of *cost of delay*.

For regular service items, there is almost no planning. Prioritization meetings happen regularly—for example, once per week. At the meeting, the product owners are told how many free slots there are in the input queue. They are then asked to answer a simple question: Which of the many things in the product backlog would they like to place into the queue this week? They may be given some additional information such as the current cycle time promise and recent performance against that goal, but that is all. The product owners then can choose the item that is likely to deliver the most value (and avoid the highest cost of delay) that number of days ahead. To elaborate, they think about which item will deliver the most value forty-two days from now or avoid the greatest cost. As a result of this prioritization scheme, kanban delays commitment until the last responsible moment, optimizing the value delivered or avoidance of cost, and virtually eliminates all overhead (or waste) from over planning. There is no prioritization in the traditional sense nor are there any plans that try to predict the future.

However, it is necessary to do some planning for items with different classes

of service. For example, if an item has a fixed delivery date for regulatory reasons and the business might be fined by the government in the event of late delivery, it will be necessary to plan the prioritization of the item based on current lead-time performance. We are creating a different class of service for an item with a significant cost of delay. In this example, there is an extremely high cost of delay but the value of early delivery is negligible. Therefore, a small amount of estimation and planning is required to ensure that the item is prioritized early enough to mitigate the risk of incurring that cost of delay but not so early as to displace other items that might generate earlier value.

## Implementing a Kanban System

### MAP THE VALUE STREAM

To implement a kanban system, you first must define the customer-valued work item types and map the value stream of those work items. For example, if you define your requirements as user stories, then user stories are one type of work item that you need to track. Map the value stream of the user story from creation to delivery in production as a series of states of knowledge discovery—e.g., analysis, development, test, and ready for deployment. Try to focus on the states the work goes through and not on the specializations of the workforce or the handoffs along the value chain. For example, if the story is fleshed out with modeling, map this activity even if it is performed by the same developers who do the coding.

Now draw this value stream from left to right as a series of columns across a white board as in figure 1. Name each column for the state of the work flow. To the far left, name the first column as an input queue—e.g., Engineering Ready. To the right of each activity state, place a column for a completion buffer—e.g., Development Complete. The next state—e.g., Test—will be able to pull from the Development Complete state. To the far right, provide a column for Release Ready. It will be from this column that items will be selected for release to production.



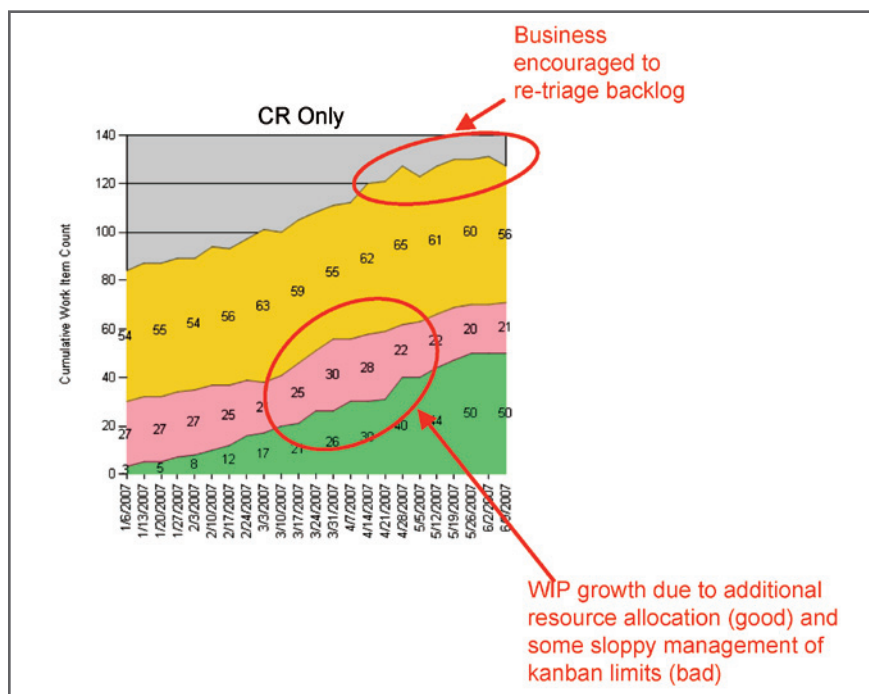


Figure 3: Cumulative Flow Diagram depicting backlog, WIP, and completed work

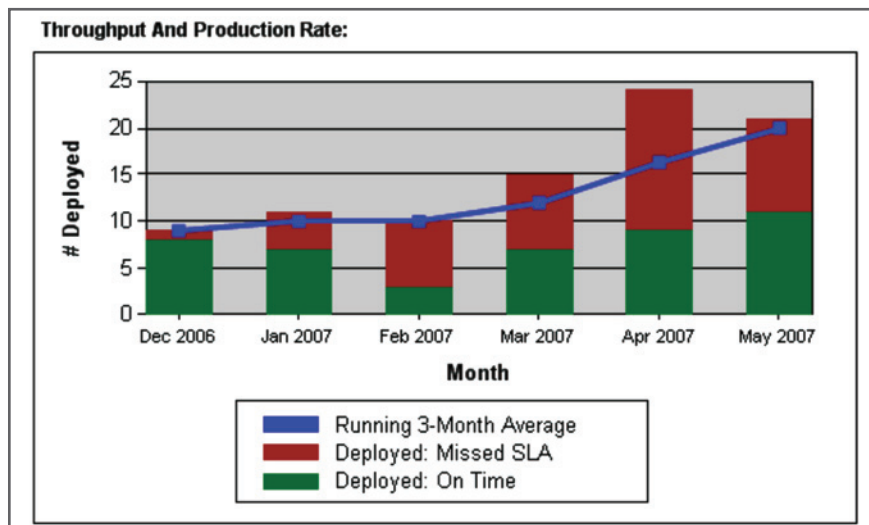


Figure 4: Throughput report showing due date performance

## DEFINE THE WIP LIMIT

Next, decide the WIP limit for each stage in the work flow and the total aggregate WIP limit for the system. Choosing WIP limits is perhaps the most difficult thing involved in setting up a kanban system. It is easy for teams to develop analysis paralysis over the WIP limits—a serious mistake. There is no need for WIP limits to be precise or perfectly correct initially. Kanban and lean systems in general are empirically adjusted to improve flow and value delivery (throughput) once in operation.

Pick some simple rules, such as “each person will only work on one thing at a time.” So, if we have five developers, the development WIP limit will be five. Then select queue sizes and work-complete buffer sizes. A good rule of thumb is to make these large enough so that there is enough work in the queue to last up to one week. For example, if your team produces three and a half user stories on average every week, make the queue size three or four. This should ensure that the team will always have new work to do throughout the week.

## DECIDE DELIVERY AND PRIORITIZATION CADENCE

The third step is to decide the cadence for delivery and prioritization. For example, if you believe you can hold a prioritization meeting with product owners or business stakeholders once per week, then you should agree on an input cadence of weekly and set queue and buffer sizes accordingly throughout the value stream. If you believe that the business can absorb new software releases every two weeks, and your configuration management and production support teams can support a release every two weeks, then agree on a bi-weekly output cadence. Only those items queuing in the Release Ready state will be labeled for release. It is very important that WIP is not allowed to escape into production. For example, at one organization, prioritization meetings were held every Monday morning at 10:00 and releases were scheduled for 1 p.m. every second Wednesday. Completed items ready at 9 a.m. on the prior Monday were configured for release that Wednesday afternoon.

## Reporting and Metrics

In a kanban system, it is important to report on the quantity (see figure 3) and age of WIP. These are the important leading indicators for day-to-day management.

For senior management reporting, use lagging indicators such as total throughput of items delivered in a given month (as shown in figure 4), actual average lead time achieved (as shown in figure 5), and spectrum and due date performance as the percentage of requests delivered into production on or before their SLA delivery date (as shown in figures 6 and 5 respectively).

## Satisfaction

At my former organization, we rarely exceed 70 percent due date performance against the SLA. However, releases were still happening every two weeks. The initial SLA of twenty-eight days was unrealistic and adjusted upwards. Forty-four days (six weeks plus two days) became the norm, but the performance only increased from 50 percent to 70 percent. This poor SLA performance indicated that better analysis was needed to break



Lead Time and Due Date Percentages		Lead Time (Average # of Days)			Due Date Performance (%)	
Interval		Target	May 2007	Dec 2006 to May 2007	May 2007	Dec 2006 to May 2007
Lead Time, Engineering Ready to Release (CRs & Bug Fixes)		30	32.5	31.1	52	50
Lead Time, Engineering Ready to Release (CRs Only)		30	32.6	40.4	50	30
Lead Time, Engineering Ready to Release (Bugs Only)		30	32.5	19.6	55	75

Figure 5: Lead time report showing due date performance

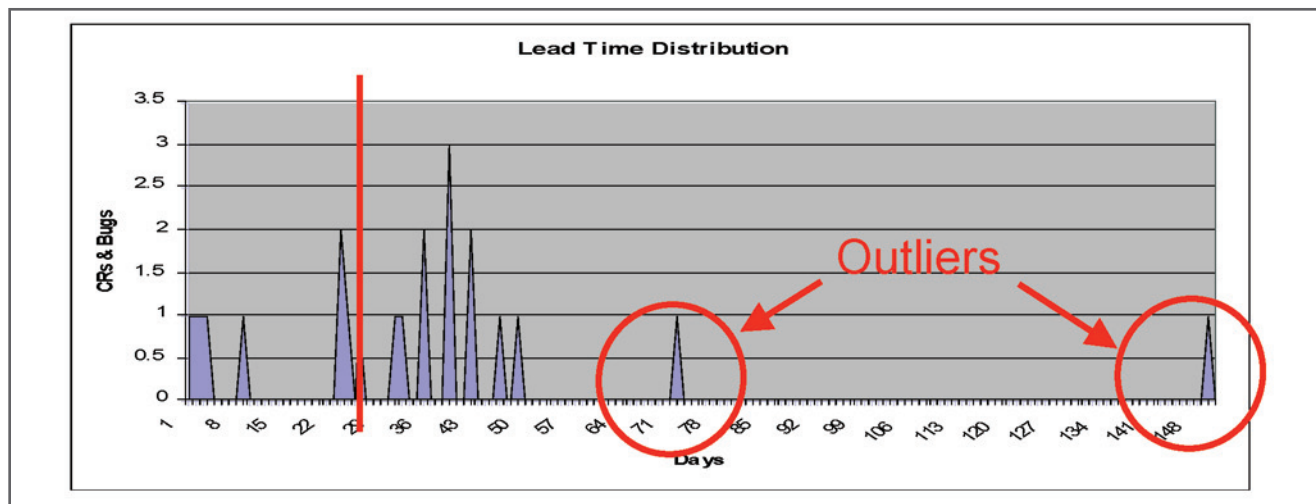


Figure 6: Lead time distribution for a given month showing SLA as a red vertical bar

work down to small enough chunks, together with better issue management and resolution to prevent impediments from blocking flow. Although 70 percent is not a strong performance, there was only one complaint in eighteen months. Why? It seems clear from experience that regular releases build customer trust and confidence. Couple this with the transparency that the kanban system provides both to WIP and flow through the value stream and you have a recipe for building strong, trusting relationships with business stakeholders. The system makes responsiveness proportional to urgency, and it seems evident that the cost of delay is relatively homogenous and linear for most items in the backlog. There is great confidence that urgent items will be delivered quickly (in fact, our items with a fixed delivery date were never late). Equally, there is full transparency on delayed items that presumably have a low cost of delay. As a result, complaints about late delivery were negligible.

## But Isn't Kanban Harder to Adopt?

One objection I hear managers raise against kanban is that it must be harder to adopt than established, iterative agile methods. The evidence does not seem to bear this out. I have observed significantly reduced resistance to change and better long-term institutionalized adoption with kanban. Others have anecdotally reported that teams adopted it more quickly by avoiding the analysis paralysis surrounding fitting work into convenient one-, two-, or four-week iterations or other behavioral changes required to learn new analysis, estimation, planning, or engineering techniques. Kanban allows you to start with what you are doing now and improve gradually.

As an example of how easy it is to adopt, in March 2008, I presented kanban at Extreme Tuesday Club in London. Within seventeen hours, one attendee had a kanban system up and running at his workplace—a major UK-based insurance company.

## Why Would I Use Kanban?

The first uses of kanban in IT work were on single-piece flow ticketing systems for software maintenance and related areas including IT service requests and business intelligence reporting. Kanban is a natural fit for such situations where projects and iterations would be a forced fit that introduces artificial bundling of items for delivery on an arbitrary date.

It first was thought that this was the natural territory for kanban and that it wouldn't be useful on larger software development projects. However, I've since found that this is not the case. Kanban has proven useful for teams that struggle to decompose and fit work into single iterations and teams that struggle with the definition of customer-valued work or that try to take the textbook definitions of agile too literally or dogmatically. The clean world of the textbook and its theory often does not fit the real world so well. Kanban helps us see the truths of the real world so that we can act on them.



## Evolution Rather than Revolution Reduces Resistance to Change

Kanban has proven to be a useful tool for cultural evolution and change management. Kanban exposes the mechanism of the development value stream. This enables the identification of bottlenecks and a better understanding of impediments to smooth flow. The result is a gradual, incremental approach to change that is empowering for everyone on the team. Kanban reduces the barriers to adoption of agile methods. It allows you to start with your process as it exists today—even if it is a waterfall process. Kanban embraces workforce specialization while exposing the effects that too many specialists introduce such as bottlenecks, queues between hand offs, and, consequently, greater WIP.

Kanban enables an evolutionary approach to agile transition. It delivers evolution based on lean principles rather than revolution based on the Agile Manifesto [4]. It has proven easy to adopt and lowers the resistance to change. Kanban eliminates wasteful coordina-

tion costs without sacrificing customer satisfaction. Many project management behaviors and artifacts we often take for granted really ought to be seen as waste in lean terms. Kanban reduces or eliminates the waste of coordination overhead that typical project management methods introduce. **{end}**

### REFERENCES:

- [1] Poppendieck, Mary and Tom Poppendieck. *Lean Software Development*. Addison Wesley, 2003.
- [2] Hiranabe, Kenji. *Visualizing Agile Projects Using Kanban Boards*. InfoQ. August 2007.
- [3] Mehta, Merwan and David J. Anderson, David Raffo. *Providing Value to Customers in Software Development through Lean Principles*. Software Process Improvement and Practice, Vol. 13, pp 101-109. Wiley Interscience, 2008.
- [4] Beck, Kent et al. *Manifesto for Agile Software Development*. 2001. [www.agilemanifesto.org](http://www.agilemanifesto.org)

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# BUILDING A FOUNDATION FOR STRUCTURED REQUIREMENTS

Aspect-oriented Requirements  
Engineering Explained  
Part 1

BY YURI CHERNAK



**D**espite much attention to the aspect-oriented requirements engineering (AORE) methodology in the academia circles, most practitioners in the software field today are unaware of this new methodology and its benefits. This two-part article is intended to fill this gap by explaining the AORE concepts and techniques from the practitioner's perspective and demonstrating their benefits by examples.

## Introduction

It is well understood that good software requirements are a critical factor for the success of software projects. The IEEE Std. 830-1998 "Recommended Practice for Software Requirements Specifications" defines characteristics of good software requirements and has become an industry standard. According to this standard, requirements should be:

- Correct
- Unambiguous
- Complete
- Consistent
- Ranked for importance
- Verifiable
- Modifiable
- Traceable

In practice, two of these characteristics—*complete* (meaning both a complete cumulative set and complete individual requirements) and *modifiable* (meaning requirements are maintainable)—prove to be the most challenging to implement. The AORE methodology specifically addresses these challenges and provides requirements analysis and specification techniques that I will explain and illustrate with examples in this article.

## Issues with Requirements Completeness

In the case of business applications, we implement functional features that can fall into one of two categories:

- *Core features* that provide basic functionality and allow the end-user to achieve specific business goals

- *Supplementary features* that provide necessary details for field validation, entitlements, connectivity, concurrency, system interface, etc.

Many of the supplementary features can be scattered across the application and tangled with core features; in this case they are called *crosscutting concerns*. By "tangled" I mean that these crosscutting concerns are invoked in the context of core features and are part of the affected core-feature functionality.

My data from four software projects (large-scale financial applications) show that each of the common crosscutting concerns—such as entitlements, field validation, and concurrency—can affect more than 50 percent of core features of a given application, as shown in figure 1. On the other hand, figure 2 shows that more than 50 percent of core features can be tangled with four to six crosscutting concerns and about 30 percent of core features can be tangled with seven or more crosscutting concerns. Hence,

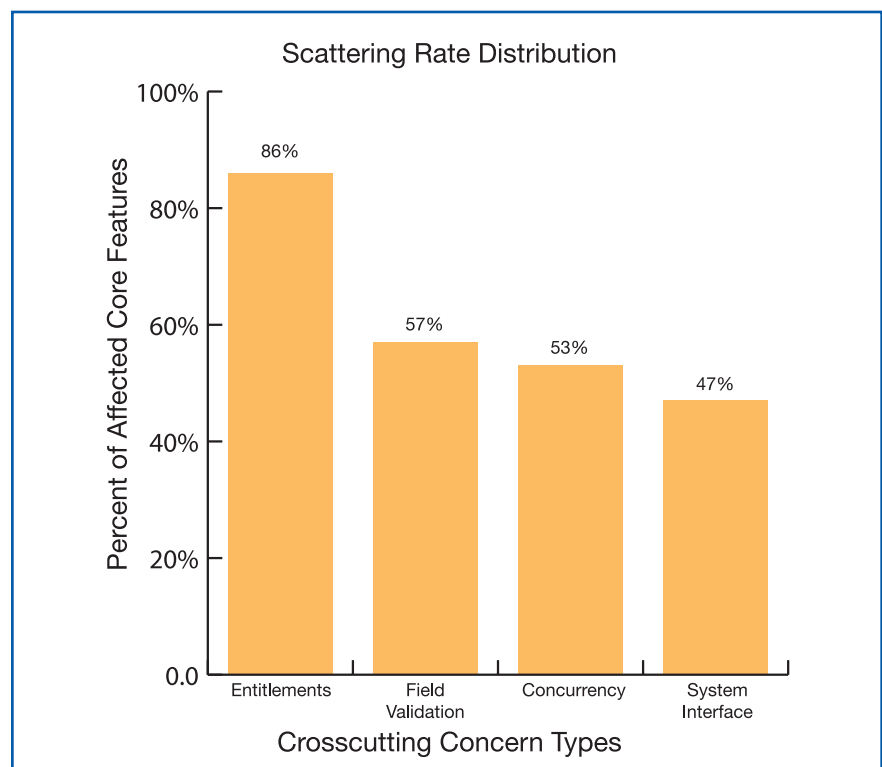


Figure 1: Scattering rate of common crosscutting concerns



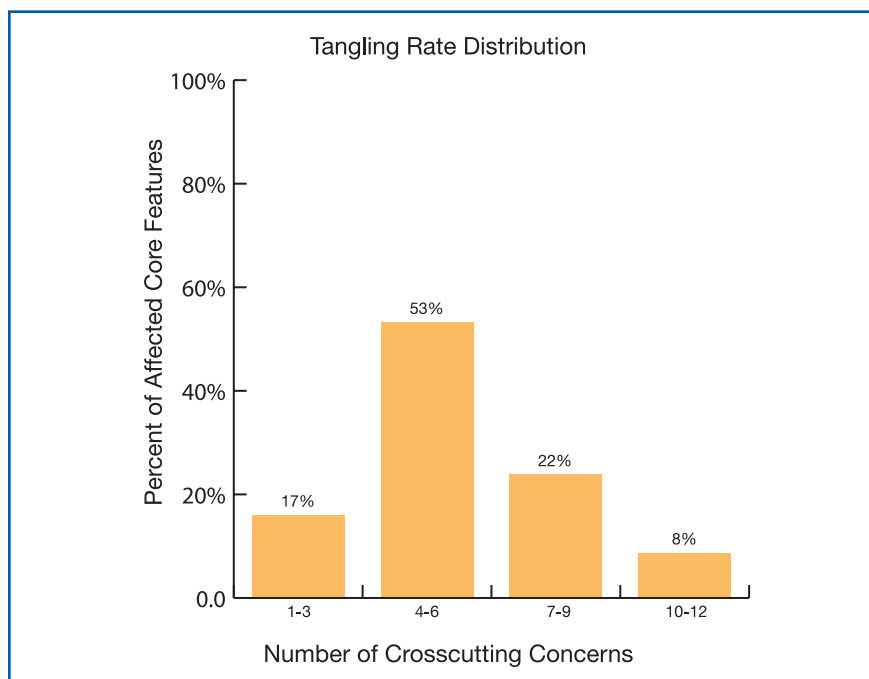


Figure 2: Tangling rate of core features

when we talk about the completeness of the individual requirements, the meaning of the term “complete” may vary depending on whether a requirement is qualified as a core feature or a crosscutting concern. In particular, a given core feature specification is not complete without analyzing and capturing details about how other scattered features are invoked and are affecting the core feature context. Correspondingly, a crosscutting concern specification is not complete without analyzing and specifying where it can be invoked and how it can affect related core features. These details are frequently missing in requirements specifications; and this kind of omission becomes a significant source of software defects, where up to 75 percent of defects can be allocated to crosscutting concerns whose impact has not been analyzed and documented.

## Issues with Requirements Maintainability

Requirements maintenance means that requirements artifacts produced in previous releases are updated for use in future releases. There are two main reasons for doing this:

- Effective impact analysis of change requests—Each new release of a production application

starts with selecting change requests (aka enhancements) to be implemented and analyzing their impact on the existing functionality. In turn, the results of impact analysis provide a basis for effort estimation and release planning. Commonly for business applications, most change requests—from 60 percent to 85 percent on average—relate to the existing functionality. Hence, to make the impact analysis of change requests effective, we need to have a complete and structured inventory of requirements accurately reflecting the current functionality.

- Lower cost of requirements development—To specify software requirements for a new release, it is much cheaper to maintain the existing documents than to create new ones when changes relate to the existing functionality. In addition, if requirements are well structured—e.g., each concern is encapsulated to remove redundancy—the cost of requirements maintenance can be further reduced.

However, in practice, project teams frequently do not maintain their specifications of software requirements devel-

oped in prior releases. Instead, they keep developing new specifications for each new release. This presents one more issue in addition to the higher cost of developing requirements. In this case, even if we combine all requirements specifications from all prior releases, still they cannot represent a complete view of the application functionality as requirements in later releases can overwrite requirements in the previous releases. Moreover, in this case we do not even know which requirements from previous releases are still valid and which are not.

When I analyzed the experience of such projects, I found that the main reason why software requirements are not maintained is the difficulty in performing impact analysis of change requests. This stems from two factors:

- Lack of requirements structure—e.g., the majority of such projects did not even define a high-level functional decomposition to structure their requirements
- Incomplete view of the existing functionality when requirements in later releases overlap and override requirements in prior releases

Thus, a good structure and modularization of requirements is critical for their maintainability and lower cost of development. Correspondingly, the fact that impact analysis of change requests is not performed and existing requirements are not maintained is a common symptom of poorly structured and incomplete requirements.

The need to improve requirements completeness, structure, and maintainability was recognized in the software industry long ago, and all existing methodologies provided techniques to resolve these issues with various degrees of success. In the following section we will discuss the major methodologies from this point of view.

## Overview of the Major Methodologies

Over the past thirty to forty years, a number of software methodologies emerged that addressed techniques to develop software requirements. Among



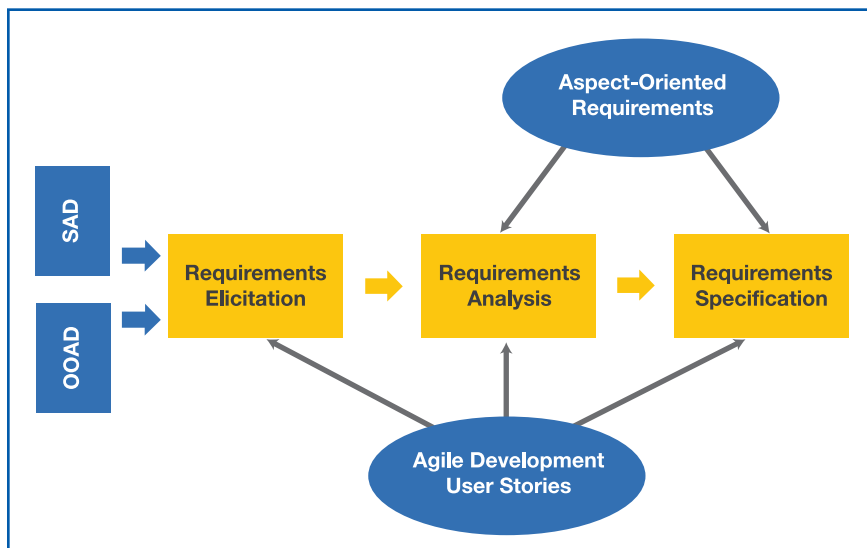


Figure 3: AORE vs. other methodologies

them the following four methodologies represent the most fundamental schools:

- Structured analysis and design (SAD)
- Object-oriented analysis and design (OOAD)
- Agile software development (ASD)
- Aspect-oriented software development (AOSD)

Even though these methodologies provide different techniques from the requirements perspective, all of them follow the same conventional requirements process, defined as three phases—requirements elicitation, requirements analysis, and requirements specification—as shown in figure 3. Another interesting point about these methodologies is that only SAD and OOAD are truly mutually exclusive. In contrast, the agile methodology offers a “light” way to develop requirements regardless of whether you follow SAD or OOAD. Likewise, the aspect-oriented methodology is not a replacement for any of the other methodologies. It offers specific techniques to analyze and specify requirements that can complement any of the existing methodologies, including the agile methodology. Below I discuss these methodologies in more detail.

### STRUCTURED ANALYSIS AND DESIGN

The SAD methodology emerged in the 1970s and introduced functional decomposition and data-flow-analysis techniques to model requirements. These

techniques enabled us to better structure requirements according to functional areas, which have in turn improved requirements analysis and maintainability.

On the other hand, while improving the requirements structure, the SAD techniques were not effective in dealing with redundancy in requirements, such as when the same requirements are present in different functional areas or when different requirements have common parts, etc. As a result, requirements models developed based on the SAD techniques were prone to redundancy that negatively affected their cost of development and maintenance.

### OBJECT-ORIENTED ANALYSIS AND DESIGN

The OOAD methodology emerged in the late 1980s and was widely adopted by the mid 1990s. It introduced use cases and the Unified Modeling Language (UML) to model requirements. UML defined specific relationships among use cases—for example, the *include* and *extend* relationships. As a result, we could encapsulate and remove parts of the application behavior common to different use cases and then present these parts as separate use cases having *include* or *extend* relationships with their respective base use cases. Thus, use case modeling can help us better structure requirements, in particular remove redundancy that resolves the main limitation of the SAD methodology.

However, conventional use case modeling still has a significant shortcoming.

In particular, use cases do not provide a complete view of the application’s functionality when supplementary requirements are scattered across the application and tangled with the context of many use cases. Moreover, if a few supplementary requirements affect the same step in a use case scenario, they can conflict with each other. In this situation, use case specifications are not complete without analyzing and capturing the impact of scattered requirements. Thus, the main limitation of use case modeling was that it did not provide techniques to analyze that impact and specify it in use case scenarios.

## AGILE SOFTWARE DEVELOPMENT

The ideas of ASD emerged at the end of the 1990s and rapidly gained popularity in the software industry after its concepts were defined in the Agile Manifesto in 2001. ASD introduced a light way to model requirements in the form of *user stories*, which are intended to capture customer needs and are used to plan releases and estimate effort. However, while developing user stories in a light way, we still cannot avoid the issue of requirements scattering and tangling. This means that scattered features can impact user stories, and without an understanding of this impact we cannot see the whole story. Thus, from the requirements process point of view ASD inherits the limitations of the SAD and OOAD methodologies. In particular, it lacks techniques to deal effectively with requirements scattering and tangling to produce a complete view of the application behavior in the context of user stories.

### ASPECT-ORIENTED SOFTWARE DEVELOPMENT

Finally, in the early 2000s, the AORE methodology emerged that, in contrast with the other methodologies, specifically addressed the issue of requirements scattering and tangling and provided techniques to improve requirements completeness and maintainability. AORE is a part of the aspect-oriented software development discipline, where the old software engineering principle “separation of concerns” (SoC) [1] is used to improve modularization of requirements and



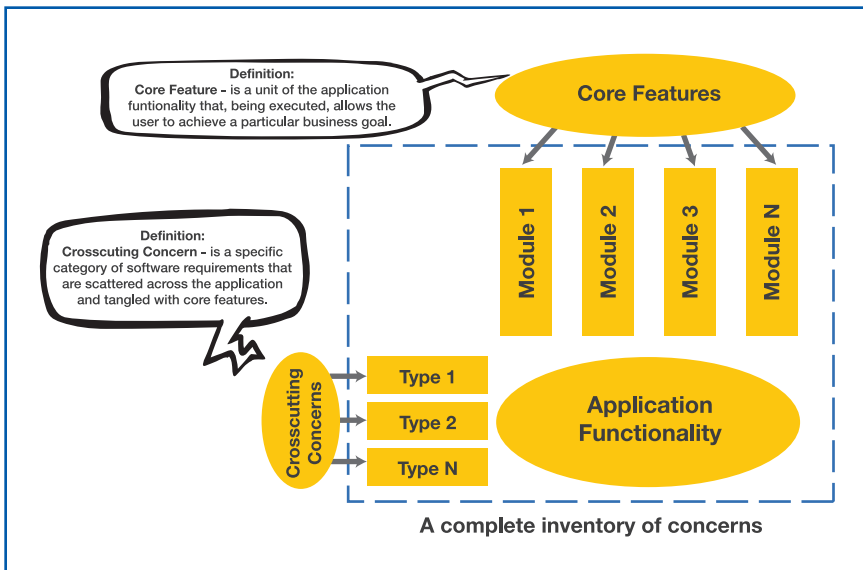


Figure 4: Separation of concerns in requirements analysis

Concern Type	Description
ET—Entitlements	This concern relates to defining various user entitlements and specifying which core features can be executed by a given entitlement.
AS—Account Setup	This concern relates to specifying attributes of client account setup and how they affect behavior of core features.
ST—Status	This concern specifies a lifecycle of a particular entity—for example, a reservation in the case of a hotel management application or a trade order in the case of trading applications. A lifecycle is commonly composed of various statuses that affect and constrain execution of core features. For example, if a reservation has a status “Canceled,” a user cannot check in or check out a guest. If a company status is “Inactive,” a user cannot add or update travel agency commissions for this company.
PT—Product Type	This concern is common to trading systems where a given application can be used for trading different financial products. For example, an equity-trading application can be used for trading stocks, options, and indices. Depending on a product type, some core features can behave differently.
FV—Field Validation	This concern is common to any business application and relates to validating individual data entry fields.
DDV—Data Dependency Validation	This concern is common to any business application and relates to validating a combination of related fields. For example, in the case of a hotel management system, a reservation's check-in date should be before a check-out date, the check-out date should be before a credit card expiration date, etc.
CN—Connectivity	This concern is common to any business application that is composed of different components communicating over a network. It relates to validating that the system's front end stays connected while the user completes a given transaction, and it defines the alternative behavior when the application goes into a disconnected state.
CC—Concurrency	This concern is common to any multi-user business application. It relates to handling concurrent manipulation of the same data by multiple users.
SI—System Interface	This concern is common to any business application that has interfaces to external systems. It relates to details of sending and receiving data to or from other systems (upstream or downstream). Such a concern can affect many core features that either use data from external systems, or produce and send data to external systems.
RGN—Region	This concern is common to global financial applications that are used in different regions around the globe. It relates to specifics of core feature behavior that depends on the different regions.

Table 1: List of common crosscutting concerns

source code. In brief, by following the SoC principle, we break a problem domain into specific aspects and then study each aspect “in isolation for the sake of its own consistency.” In the case of software requirements, we decompose an application’s functionality and separate requirements into two categories: core features and crosscutting concerns. Core features can be structured by application modules and crosscutting concerns can be structured by their specialized types, thereby improving requirements modularization. We then analyze and document the impact of crosscutting concerns on the context of core features by using defined composition rules to improve completeness of requirements specifications. Thus, AORE does not replace any of the existing methodologies but rather complements them with improved requirements analysis and specification techniques. As a result, we can produce better-structured requirements and more complete specifications that are easier to analyze and cheaper to maintain.

## AORE Analysis Techniques

Regardless of which methodology we follow, it is important in the analysis phase to define the application decomposition and identify the inventory of concerns that lay ground for modularization and structure of a future requirements model. We can identify core features, for example, by following SAD and performing top-down functional decomposition or by following OOAD and decomposing functionality into use case packages and use cases. In either case, the application functionality is partitioned along just one dimension—i.e., core features. By contrast, in AORE we perform two-dimensional decomposition and separate concerns by core features and crosscutting concerns (as shown in figure 4) thereby improving the overall modularization of our requirements model. In addition to two-dimensional decomposition, some researchers in the AORE field study the concept of multi-dimensional separation of concerns (MDSoc). Because of limited space, discussing MDSoc goes beyond the scope of this article.

Crosscutting concerns are those features that are scattered across the ap-



	Feature 1	Feature 2	Feature 3	....	....	Feature N
CCC 1	1	1	0	0	1	1
CCC 2	0	1	0	1	1	0
CCC 3	1	0	1	1	0	1
....	1	1	0	1	0	1
CCC N	0	1	1	0	1	0

Figure 5: Composing crosscutting concerns with core features

plication and do not fit the functional decomposition concept. Identification of crosscutting concerns can be based, first, on our prior experience with similar applications and our common sense. Second, when specifications of software requirements have been developed, we can analyze them by looking in the text for some recurring “themes”—i.e., repeatable and scattered chunks of requirements. Such chunks, being refined and encapsulated, can be added to the list of crosscutting concerns.

Thus, requirements that we can model as crosscutting concerns should fit the following characteristics:

- They need a context of a core feature in order to be invoked.
- They impact the context of core features—i.e., they can constrain, interrupt, or enhance (add detail to) a given core feature.
- They are sufficiently scattered—i.e., they affect more than one or two core features.

Examples of crosscutting concerns that are common to business applications include entitlements, field validation, data-dependency validation, connectivity, concurrency, system interface (to other systems), and so on. See table 1 for a more complete list and descriptions of common crosscutting concerns.

Note, in this article I discuss only functional crosscutting concerns; however, some non-functional requirements (aka quality attributes), for example, performance requirements can also be modeled as crosscutting concerns.

After we have identified a list of core features and a list of crosscutting concerns, we have a complete inventory of requirements. To complete our analysis, we now need to put them in a specific structure that reflects their mutual impact. This structure can be conveniently presented in the form of a requirements composition table (RCT). See the sidebar for a summary of RCT benefits.

Composing a requirements structure means that for each core feature context we indicate which crosscutting concerns impact this core feature and become a part of its context. To produce a composition table, we take one core feature at a time and, while going through the list of crosscutting concerns, we determine which concerns from the generic list should be applicable to that core feature context. When we determine that a given concern is applicable, we indicate it in the corresponding cell in the table by entering “1”; otherwise, we enter “0”, as illustrated in figure 5.

Let’s discuss in more detail an RCT example for an imaginary hotel management system. At a high level, the

## SUMMARY OF RCT BENEFITS

A requirements composition table (RCT) is a requirements-analysis artifact that has proven to be valuable on many of my projects. The most important benefits of an RCT for developers and testers are:

- Planning iterative and incremental development
- Supporting agile test-driven development—in particular, helping us more accurately measure story points to estimate velocity
- Supporting analysis, development, and maintenance of software requirements
- Planning functional testing
- Supporting test-coverage assessment
- Supporting exploratory testing
- Providing a framework for reverse engineering requirements (production systems)
- Supporting the impact analysis of change requests while planning new releases (production systems)
- Supporting knowledge transfer to offshore resources (offshore development or testing)

Discussing these RCT benefits in detail goes beyond the scope of this article. However, you can find a detailed discussion about how RCT can be used for test coverage assessments in my previous article, “Mind the Gap,” published in the March 2008 issue of *Better Software* magazine.



**“Composing a requirements structure means that for each core feature context we indicate which crosscutting concerns impact this core feature and become a part of its context.”**

"01. Front Desk" Module												
List of Concerns	01.01. Create Guest Reservation	01.02. Update Guest Reservation	01.03. Cancel Guest Reservation	01.04. Check-In Guest	01.05. Check-Out Guest	01.06. Post Charges to Guest's Folio	01.07. View, Update Folio Charges	01.08. Create Message for Guest	01.09. View, Cancel Message	01.10. Add Travel Agency Commissions	01.11. View, Update Travel Agency Commissions	01.12. Manage Rooming List
Core Functionality	1	1	1	1	1	1	1	1	1	1	1	1
GUI Features	1	1	1	1	1	1	1	1	1	1	1	1
Crosscutting Concerns												
ET - Entitlements	1	1	1	1	1	1	1	1	1	1	1	1
ST - Status	0	1	1	1	1	1	1	1	1	1	1	1
FV - Field Validation	1	1	0	1	0	1	1	0	0	1	1	1
DDV - Data Dependency Validation	1	1	0	1	0	1	1	0	0	0	0	0
CC - Concurrency	0	1	1	1	1	0	1	0	0	0	1	1
CN - Connectivity	1	1	1	1	1	1	1	1	1	1	1	1
SI - System Interface	1	1	1	1	1	0	0	0	0	0	0	0

Figure 6: RCT example for a hotel management system

whole application can be decomposed into a few modules including “01. Front Desk.” Figure 6 shows the RCT created for this module.

Columns in this table represent the inventory of core features that can be documented later—for example, as user stories structured by application modules or as use cases structured by use case packages. Each core feature identifies a particular business goal that the end-user can accomplish and provides a context to perform the impact analysis. Rows in the table represent a generic list of concerns composed of core functionality, GUI features, and crosscutting concerns. Crosscutting concerns can be documented later as supplementary requirements structured by the types of crosscutting concerns. In the simplified RCT example shown in figure 6, we have a list of seven crosscutting concerns; however, for complex applications, such a list can commonly include up to twenty crosscutting concerns.

By default, each core feature context has core functionality. Also in this module all core features have GUI; there-

fore, we enter “1” in all cells related to these two concerns. Then we analyze the impact of crosscutting concerns. We take one core feature at a time and go down the list of crosscutting concerns to identify which of them impact the core context. After we have completed this analysis, all the cells in the table are populated with either “1” or “0”, reflecting a complete inventory and composition of concerns.

Thus, by separating core features from crosscutting concerns and then identifying the impact of crosscutting concerns on the core functionality, we resolve the issue with requirements scattering and tangling. We capture such analysis results in an RCT that should not be confused with a requirements traceability matrix (RTM).

An RTM’s purpose is twofold:

- To identify and maintain the relationship between software requirements and their sources, which is known as *backward traceability*
- To identify and maintain the relationship between software requirements and other project artifacts

developed based on requirements, which is known as *forward traceability*

In contrast, the RCT is used to capture modularization and composition of requirements, thereby providing a holistic view of the application functionality. Such a structured view can be used as a frame of reference to effectively support various tasks and can provide multiple benefits discussed in the sidebar.

Thus, in this article I discuss that requirements scattering and tangling effects present challenges for producing complete and maintainable requirements. AORE is a new methodology that specifically addresses these challenges. Part 1 of this article gives an overview of the AORE analysis techniques that can help us develop a better-structured requirements model and present it in the form of an RCT. An effective structure of requirements is key to improving requirements maintainability and change impact analysis. AORE can also help us produce more complete requirements. It provides specification techniques that can help us better document the mutual impact of requirements. Such techniques I will discuss and illustrate with examples in part 2. **{end}**

#### REFERENCES:

- [1] Dijkstra, Edsger W. *A Discipline of Programming*. Englewood Cliffs, NJ: Prentice Hall, 1976.

#### Sticky Notes

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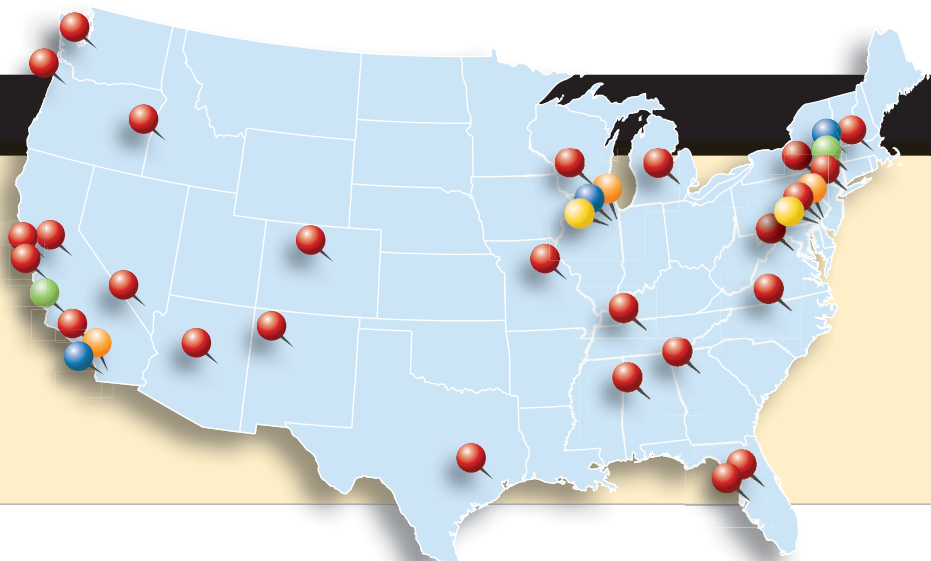
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## VectorCAST Version 5.0

NORTH KINGSTOWN, RI—Vector Software has announced the availability of VectorCAST version 5.0.

Features include:

- Complete test harness construction for unit and integration testing
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- Code-coverage analysis
- Push button regression testing
- Test execution on host, simulator, or embedded target
- Automatic tests based on decision paths
- User-defined tests for requirements-based testing
- Automated coding standards enforcement with C and C++
- Test execution playback to assist in debugging
- Integration with IBM/Telelogic's Rhapsody Modeling and DOORS Requirements Tools

Visit [www.vectorcast.com](http://www.vectorcast.com) for additional information.

## PureCM

CHESHIRE, UK—PureCM is a tool to facilitate day-to-day activities for both development managers and developers, no matter which process is used. And as software development is more than coding, the ability to collaborate closely with people working on documentation, image files, or other related content greatly enhances teamwork and productivity, offering revision control for any file type.

PureCM allows tracking changes throughout the development lifecycle and provides visibility across team boundaries for any process type. PureCM does not impose processes; it removes obstacles that inhibit the application of best practices.

Visit [www.purecm.com](http://www.purecm.com) for more information.

## Elementool Bug Tracking 6.0

NEW YORK, NY—Elementool, Inc. has launched Elementool Bug Tracking 6.0, the latest edition of its industry-leading project management tool to provide a fully-integrated software development

management solution that can save development teams hundreds of hours a month and thousands of dollars in project costs. With integrated, efficient communication tools and time-tracking features, Elementool Bug Tracking 6.0 enables project managers to readily identify bottlenecks, evaluate and adjust project priorities, and effectively meet deadlines with an easy-to-use, customizable, Web-based interface at an affordable price.

Bug Tracking 6.0 integrates Elementool's industry-leading bug-tracking solution with four other Elementools—Help Desk, Time Tracking, File Sharing, and Forums—into one affordable project management package. An integrated instant messaging feature provides efficient and secure communication between teams in different locations, enabling teams to chat simultaneously to discuss issues. The package also includes a robust and customizable reporting feature that makes generating status reports quick and easy.

Visit [www.elementool.com](http://www.elementool.com) for more information.

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# 10 Things You Might Not Know About

## Automation

by Linda Hayes

- 1 **THE DATA IS THE HARDEST PART.** Automation is all about repeatability, and if your data is unstable or unpredictable, then your tests can't be repeated. Consider using your automation tool to load data so you always know the state of your test environment.
- 2 **RECORD AND PLAY IS A MARKETING APPROACH, NOT AN IMPLEMENTATION STRATEGY.** Designed to make it look easy long enough for your check to clear, recorded scripts are nothing more than bad, fragile code. The mere mention of this term by a vendor should be grounds for expulsion from serious consideration, as it has been proven responsible for untold failed automation efforts. Don't be fooled.
- 3 **DON'T WRITE PROGRAMS TO TEST PROGRAMS.** Don't try to replicate application logic in your tests or you will end up with more code than the application itself has. Write your automated test to expect the expected and use logic only to recover from the unexpected.
- 4 **VOLUME IS NOT A VIRTUE.** Just because automation can run more tests than you can perform manually doesn't mean more is better. Every test takes time to design, develop, execute, and analyze. Worry about coverage, not quantity.
- 5 **MAKE MAINTENANCE A PRIORITY.** We test software because it changes. If it takes too long to update your tests, you can't keep up and you will have to revert to manual testing to meet schedules. If a vendor tells you it is easier to re-create the test than to maintain it, run for your life. Be sure that maintainability is a key quality of any test library design.
- 6 **DON'T RELEGATE AUTOMATION TO REGRESSION.** Anyone who says you can't automate until the application is complete and stable doesn't know how to design a proper test. Modern techniques allow tests to be automated before the code is even available, allowing automation to play a part in even the most agile of environments.
- 7 **DON'T EXCLUDE THE EXPERTS.** If an automation tool is so technical it can't be used by the people who know your application best, keep looking. Programming prowess is not a substitute for domain expertise. Testing is only as good as the tester.
- 8 **COLOR INSIDE THE LINES.** Establish and enforce naming conventions, design standards, and change control procedures. Without them, you will lose track of your test assets, resulting in duplication and omission. If you can't find a test, you can't use it, and if you can't make sense of it, you can't maintain it.
- 9 **DOCUMENT YOUR DESIGN.** The most elegant of all architectures has no value if you can't understand it. Many a genius has labored over an advanced approach only to leave confusion behind when he leaves. Insist on diagrams and documentation that describe the overall structure and the purpose of components.
- 10 **INVOLVE DEVELOPMENT.** Unless the developers cooperate by delivering testable code in the form of persistent object names, exposed methods and properties, and enough heads-up on changes for you to react, all of your efforts will be in vain. Make programmers your partners, educating them about what it takes to automate and supporting them with automated build tests and other time savers.



# Are Your Pants on Fire, or Do You Suffer from Split Focus?

by Johanna Rothman

Imagine you're working on a project. You're dealing with risks and making technical decisions—pretty much humming along. The project isn't easy, but you're making progress. One day, you arrive at work and your boss says, "Stop working on that project. Work on this one, instead." You do. A week later, the same thing happens. Welcome to the Pants on Fire schedule game.

Pants on Fire is bad enough, but some managers don't even let you work on just one project at a time. I had a boss who said, "I'd like you to spend 50 percent of your time on project A, 35 percent of your time on project B, and 15 percent of your time on project C." You and I both know there's no way you're making progress on projects B or C, but they do successfully split your focus off project A. The multitasking you're doing is the Split Focus schedule game.

Split Focus and Pants on Fire have similar causes: Your managers can't or won't decide which project is most important right now. Making those decisions is tough, and some managers don't know how to decide.

People who have been working in the software industry for more than three weeks have probably encountered these two schedule games. Both of these games cause context-switching for the project team members—including the project manager—and will slow your projects, sometimes to a crawl.

What should you do if you're a project manager or technical lead and you realize management is causing most of the problems on your project? Prayer might be helpful but is not enough. Here are some actions you can take.

## Start with an Agile Approach

If you're not already working in short (one- to two-week), timeboxed iterations, implementing by feature and integrating as you go, start that now. One of the reasons your managers might have

such a difficult time selecting the most important project and keeping people on it is that they don't know when you'll be done with your project. With timeboxed iterations, you can show them how far along you are at the end of the iteration, and you have a better chance of predicting when you'll be done.

Say your organization needs to release something in six months, but you won't be done for eighteen months. You might be able either to release something from this project in six months or to put this project on hold until you've completed another project in six months or fewer.

## Know What "Done" Means

Make sure you're doing the minimum required. Sometimes your managers will use Pants on Fire to move people off one project that they think is complete enough. If you haven't defined release criteria, make sure everyone understands what "done" means for this system.

## Estimate with Ranges

Sometimes managers invoke Pants on Fire or Split Focus because the team missed its estimate for project completion. Instead of only providing one date for project completion, try providing a range or a confidence level with different dates. Say to your manager, "I have a 70 percent confidence we can meet June 30, and a greater than 95 percent confidence we can meet September 15," and you'll have a different conversation about when to stop this project and start another one.

## Build a Project Portfolio

If you've already taken these steps and your management still wants to have your project team multitask or switch projects frequently, then it's time to show management what everyone is

“Making those decisions is tough, and some managers don't know how to decide.”

doing in a project portfolio. Once you have a portfolio, you can analyze it to see which projects are at which priority.

To build a portfolio, first collect the list of all the work for all the people who are being shuffled from one project to another. Remember, it's the list of project work, ongoing work, periodic work, ad

hoc work, and management work.

Organize all that work in a grid, with months across the top and the list of projects down the side. Use the estimated start and end dates for each piece of work, so it's easy to see when you think the work will start and end.

Once you've got the list, try to rank the projects. That means assigning a unique number—1, 2, 3, 4, and so on—to each project. The highest-ranked projects are the most valuable to the organization. Discussing a ranked list with your manager might help you have a more productive conversation than if you just discuss a list of projects.

## Qualitatively Evaluate Each Project

If you don't know the value of each piece of work, use these qualitative questions to evaluate them:

- How does this project fit in with all the others?
- What is the strategic reason for this project?
- Is there a tactical gain from completing this project?
- To make this project successful, are we ready to adequately fund it and staff it?
- Do we know what success looks like for this project?

Sometimes a qualitative evaluation isn't enough, so you might need to use numbers to evaluate the projects.



## Quantitatively Evaluate Each Project

If your managers can determine the strategic and tactical goals for this project, it's time to see if the money you'll spend on the project will gain the organization any return. The return you gain may not be in revenue; it could be in the ability to release products faster. But if there's no quantitative or qualitative return, you and your managers need to decide if this project is worthwhile.

- When will we see any monetary return?
- What's the expected revenue curve?
- What's the expected customer acquisition curve?
- When will we see retention of current customers?
- What's the expected customer growth curve?
- When will we see a reduction in operating costs?
- What's the expected operating cost curve?

Answering these questions isn't easy, but it is necessary.

## In Closing

When your project's problems aren't caused by something you and the team are doing, it's time to dig deeper. If you feel as if you've got whiplash from all the project changes, build a portfolio and discuss it with your management. What have you got to lose? **{end}**

**NOTE:** This article originally appeared on StickyMinds.com.

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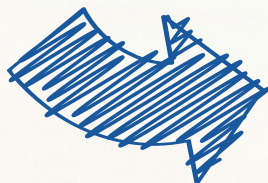
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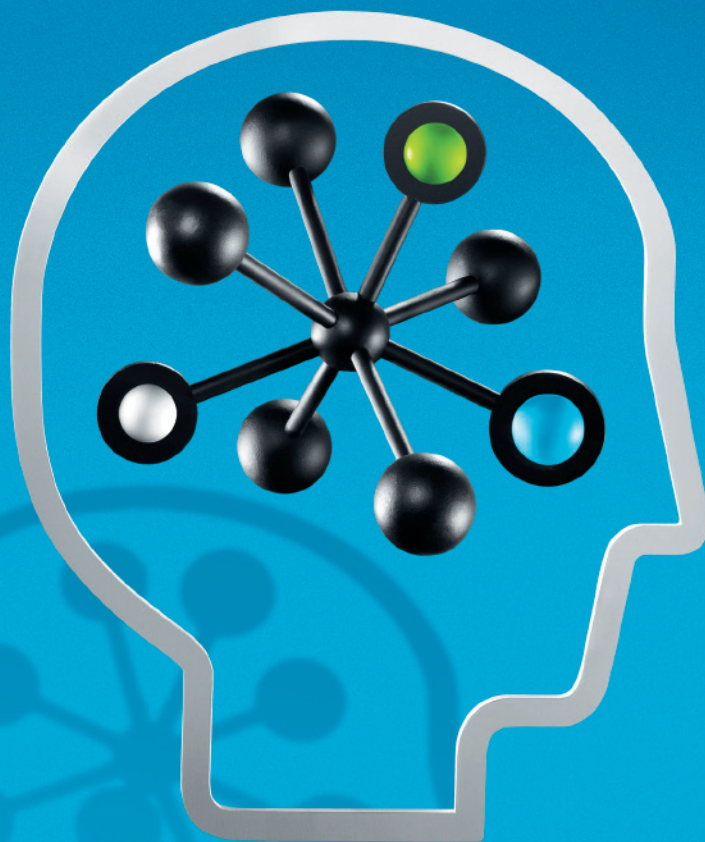


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