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Original Software TestDrive v5.5, TestDrive-Assist v3.0

Original Software - TestDrive v5.5, TestDrive-Assist v3.0

By Michael Azoff

Abstract

TestDrive is a functional and regression testing solution for applications that use Graphical User Interfaces, including PC Client applications, browser-based Web applications, and legacy green-screen applications. Unlike conventional systems test tools, TestDrive automates the creation and maintenance of scripts thereby eliminating the considerable burden of writing and updating them. TestDrive features self-healing technology that evolves the auto-generated scripts as the application changes. A central repository of auto-scripts, data, and test plans creates a knowledge-base with collaborative benefits. Since users of the product do not need to be programmers it is open to business analysts and end-users involved in product testing and user-acceptance tests. TestDrive-Assist is designed to assist manual testers as they work, capturing the testing process and input data; these can be re-run as automated tests. TestDrive will be most suitable for medium-to-large enterprises committed to a high-quality software testing regime. TestDrive-Assist is likely to have a larger market appeal and provide an introduction to the potential of Original Software products.

Key Findings

Strength

- Automated system/load testing requires no programming, and helps reduce risk.
- Self-heal technology allows existing scripts to evolve with application changes.
- Suitable for most application front-ends, including Microsoft .NET, Java, and Ajax.
- Central resource repository creates a knowledge-base for easy user access.
- Variable Data input automatically runs input combinations through the application.
- Performs database roll-back after tests to return to same starting position.

Weakness

- Limited integration with other Lifecycle Management tools.
- Runs solely on a Windows platform.

Look Ahead

Enhancements to TestDrive will add features that are already available in TestDrive-Assist.

FUNCTIONALITY

Product Analysis

Problems with software that is bug ridden or fails to execute, continue to beset projects today. The statistics indicate that as projects scale up to millions of lines of code and many hundreds of programmers, the project success rate is less than 50%. Whilst 'mega-projects' are prone to politics as a cause of failure, the issue of quality is magnified. Lesser scale-projects are also prone to poor success rates, where failure may range from delivering a successfully running application that is useless for the needs of users and the business, to 'dead on arrival'.

It would be assumed that with all the current tools that are available today, project success rates would be much higher, but the quality issues continue to plague software development. The Internet has also exacerbated the problem, because for competitive reasons, businesses need to deliver new solutions faster than ever to the market before the competition does so and thereby gain an edge. The Internet has reduced product lifetimes, the churn on Web sites has increased, and the need to keep up with changes in technology are all putting great pressure on IT to deliver high-quality solutions within a shorter timeframe.

There are some indications that the application development world is fighting back. Development is one answer, especially with its emphasis on Test-Driven Development (TDD). This entails developers writing unit tests first, before coding requirements. In essence, the unit tests are requirements or specification tests at a micro-level. The practice of continual integration ensures that immediate feedback is available to project managers, who can build up track records of defect density, coverage, and code churn. However, it is in the next stage of testing, namely in system and load testing that progress has been limited. It is at this stage that the whole application is being tested – and at deep levels so that testing of complete transactions that branch deep into the application logic takes place.

Original Software has set out to tackle the reasons that system testing is failing to deal with the quality issues outlined above. Its solution is to introduce a greater degree of automation into the practice. A large measure of the problem is that the traditional approach requires scripts to be written and their code to be maintained, which adds its own management problem. Scripts need to be updated and maintained to remain useful and for complex projects this is a significant undertaking. Quality Assurance (QA) staff turnover and lack of documentation add to the burden of maintenance. Adopting an automated approach removes the need for scripts, so Original Software's TestDrive removes in one stroke, a major handicap of code-based tools. Automation also frees QA staff to deal with the more important focus of their task, namely devising tests, rather than having to become experts in scripting languages.

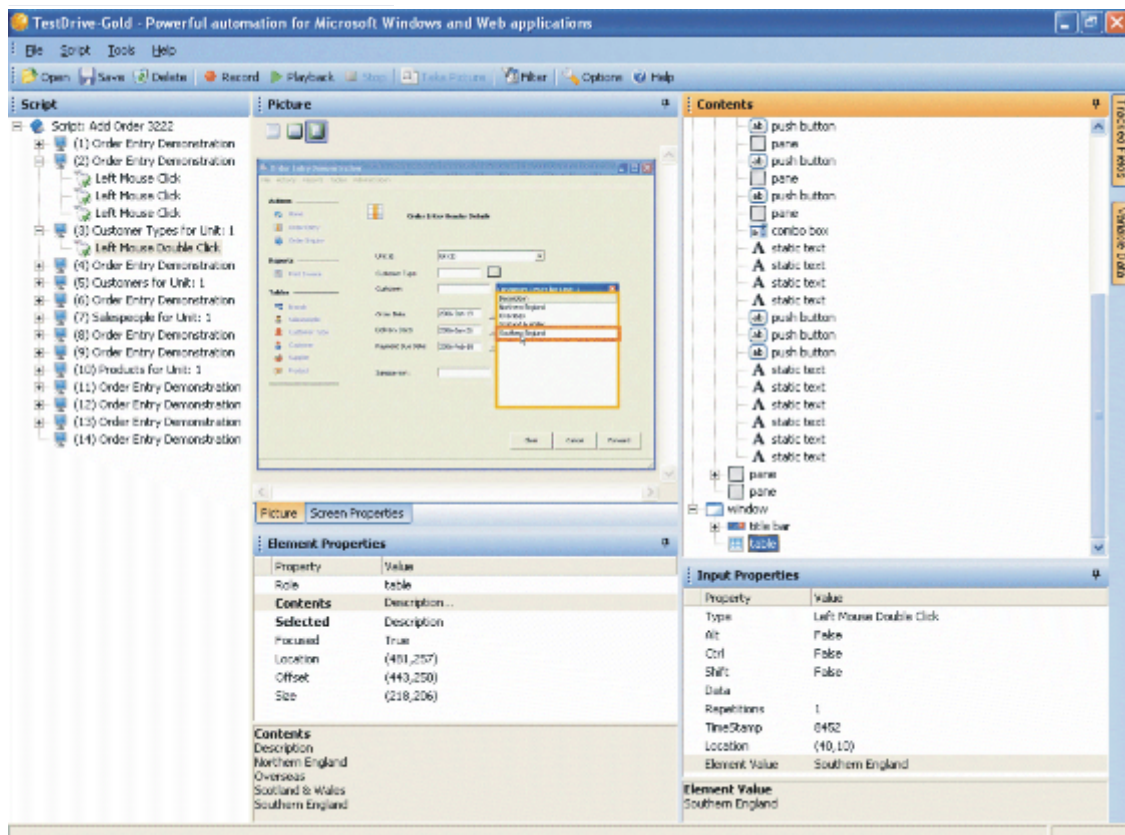
Original Software also addresses manual testing with its product TestDrive-Assist, currently in version 3.0. The vendor's research shows that over 80% of testers use manual methods and therefore providing a tool that will take from manual to greater automation is desirable. Further, Original Software's survey indicates that of those testers using automation, only 5%-10% are achieving success using automation. Automation is ideally applied in the parts of a development project that have relatively few changes, and therefore pose a low risk and are fairly stable. The medium to high change category corresponds to high risk and is also better tested using manual methods. Thus TestDrive-Assist works in the background as screen interfaces are being tested or worked by end-users manually, and all the data input as well as screens are captured and

saved for later retrieval. For and DB2 databases, TestDrive-Assist will also extract from the database log tables, the relevant information about what was happening at the back-end during the end-user presentation layer activity.

All this information is stored in TestDrive's database and a developer can then rerun and step through the sequence as performed by the end-user and have a wealth of data displayed to assist in diagnosing problems. For example response times are automatically captured and provide hard data against subjective experiences related by end-users. This information can be output in pdf format for developers to inspect. The reports show what actually changed in database tables, so for example, if the developer was not expecting a certain table to be updated, then TestDrive-Assist will pick this up.

TestDrive-Assist provides traceability, auditing capability, and visibility into testing. It captures screens, objects, input steps, and database changes (both before and after information). Manual tests captured in this way can be saved for automated running as part of an automated-testing practice. In doing so it is possible to increase the range of input data values used and create a test set.

Fig 1: TestDrive User Interface



Source: Original Software© Original Software

Product Operation

TestDrive offers ease-of-use and an intuitive interface to enable automated testing to be readily applied, cutting time-to-market development cycles, and reducing application errors and failure. TestDrive combines several innovative software testing technologies:

- **Code-free Testing:** The user interacts with a GUI interface; no scripting language of any kind is needed. This frees the user from learning a new programming language, and the need to write, and maintain complex scripts. The Busy Sense feature enables automatic application timing. Fields are tracked and data is captured for later re-running.
- **Self Healing Scripts (SHS) Technology:** As applications change throughout the development lifecycle users no longer need to recreate scripts, SHS allows the existing auto-generated scripts to automatically re-generate, improving the productivity and efficiency whilst ensuring existing scripts remain usable and valid.
- **Advanced Script Controls:** Variable Data controls enable one script to simulate multiple business transactions without having to re-launch individual scripts. There is block matching for automatic identification of block and grid data.
- **Action Maps:** This feature enables users to combine and integrate test components for regression and system tests, across platforms and technologies. Action maps that link auto-generated scripts enable business processes to be tested.
- **Validation Rules:** VB Script can be used to validate test results during processing steps.

TestDrive-Assist provides manual process capture, test tracking, and instant diagnostics for error reproduction. It supports database effects for supported platforms and can be used as the basis for automated scripts.

TestDrive is built on and Java assistive technology enablers, including Windows messages, and Document Object Model. The product automatically takes a picture of every screen being tested, and analyses it at the object level. Screen contents, object properties, and any input or output is automatically captured and displayed in a fully-interactive GUI. This completely negates the need for any coding knowledge whatsoever by the user, and is, according to Original Software, the only tool that truly does so (see Figure 1).

TestDrive has the facility to rollback database changes made during tests so that it is possible to exactly reproduce the same test data set during testing and against exactly the same database state, that way any changes to the code or process can be tested accurately.

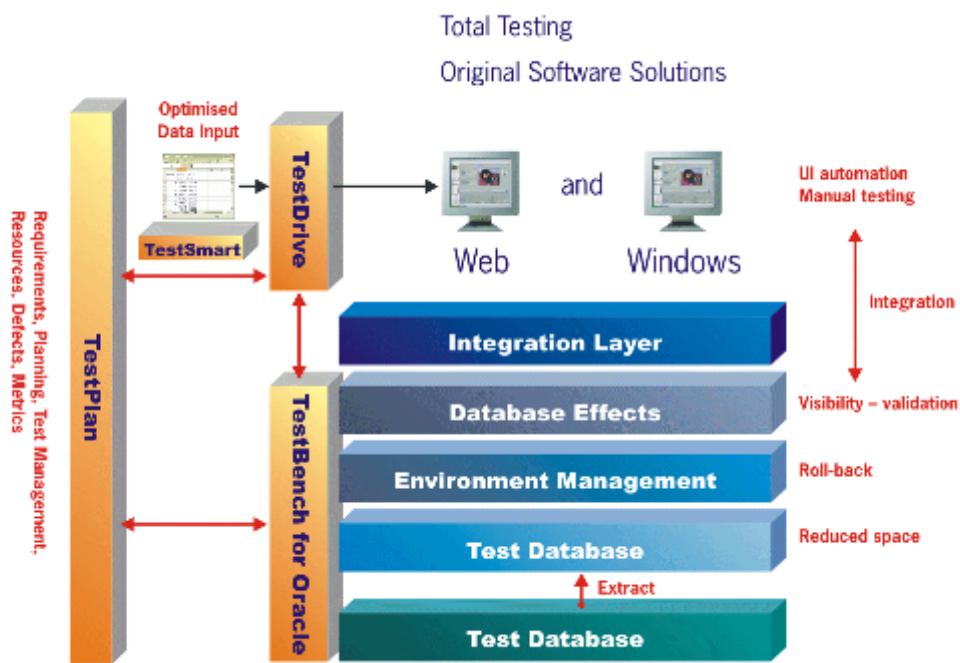
In order to extract information from the application screen, TestDrive exploits accessibility classes designed for compliance with disability laws, which enable people with disabilities to interact with software applications. The company exploits these same classes, enabling its testing tools

to also interact with applications. .NET includes assistive technology as standard therefore making .NET applications amenable to TestDrive. This is also the case with Java using the Java Accessibility Grid. Other application platforms that TestDrive extracts from include Lotus Notes, and any output that appears in a browser, including Java applets and HTML.

TestDrive will in addition work with Asynchronous JavaScript And XML (Ajax) applications, also known as Rich Internet Applications (RIAs). Support is available for a number of Web development languages: Java, Java Server Pages (JSPs), Perl, Python, PHP, etc, as well as all major development languages. The product is designed to test any GUI or browser application out-of-the-box, as well as green-screen application testing. The user interacts with TestDrive through an intuitive point-and-click interface and this auto-generates internal test scripts.

One of the problems with traditional scripts is that they very quickly become out-dated as the application changes during development. Original Software's answer to this is SHS: this technology allows the existing auto-generated scripts to be run on changed applications. These scripts are then automatically updated, following criteria that the users can pre-set. With minimal maintenance users can evolve their existing scripts without needing to generate new ones.

Fig 2: TestDrive Architecture



Source: Original Software© Original Software

SHS uses an algorithm that detects where changes have been made to a screen, including altogether new screens and Web pages. The changes can be automatically allowed to update

the existing auto-test scripts or the user can manually vet changes. Screen controls that have been simply displaced from their previous position are remapped to their new position. Thus SHS allows existing scripts to run without failure, speeding up the QA process through all the development iterations.

Advanced features include auto-script controls that provide for variable data so that one auto-script can simulate multiple business transactions. A file of pre-defined data is created and assigned to the auto-script so that, during playback, different data will be presented with each run. Original Software has an additional module, TestSmart, that will automatically create optimised variable data. The Tracked Fields feature enables data created during the running of an application (e.g. purchase reference numbers) to be captured and used throughout test playback.

Most software defects are the results of a bug activated by a single instance of bad data or a combination of two pieces of data where the presence of both is necessary to trip the bug. An effective test strategy is therefore pairwise testing where tests are conducted with tests of pairs of data variables. This is more efficient than an exhaustive strategy of testing all combinations. TestDrive Variable Data feature makes it easy to set up pair-wise testing: as the number of independent input variables in an application can be enormous the dimensionality of exhaustive testing makes it impractical to test every permutation. Pair-wise goes one step better than testing one variable at a time, by testing two variables at a time – from a statistical viewpoint most bugs are captured in single and pair tests.

The Action Maps feature enables a business process to be tested by logically linking different test elements into a sequence. The Action Plans module then enables the script sequences to change automatically during test playback, according to the variable data presented during the run. Action Plans can reflect a whole range of possible scenarios and outcomes with a single script sequence.

TestDrive has a BusySense feature that detects when a screen or Web page has loaded properly before progressing to the next stage of an auto-script.

TestDrive will also test the server side through integration with other Original Software products: TestBench for and TestBench for iSeries. The TestBench testing engine works on the server, capturing and analysing all of the server activity related to Web, GUI, or 'green-screen' applications.

Centralised storage of test resources is possible on SQL Server, , and DB2 databases. Thus all test scripts, results, and data can be accessed and shared by the entire QA/testing team, becoming a central testing knowledge repository.

In Butler Group's opinion, TestDrive can help reduce risk in application development through its innovative automation, speeding up the testing phase. There could be better support for Requirements Management systems as testing is strongly tied to requirements.

Product Emphasis

TestDrive offers three key advantages: earlier detection of errors; central storage of resources which, for example, aids reusability of test scripts; and more efficient technology. Automation

speeds up the test process, allowing products to reach the market faster, and this results in indirect Return On Investment (ROI) benefits, such as gaining early market share, as well lower support costs through improved product quality.

TestDrive-Assist fits in easily with existing test practices by working alongside testers, capturing the exact steps performed in the test and removing the need to repeat a test to document errors – the documentation already exists through the product reports. This is an important time saver, as problem cause and analysis may involve distributed team members and documenting the problem accurately is crucial.

DEPLOYMENT

TestDrive runs on the Microsoft Windows platform, implementation usually takes two weeks for product installation, training, and setting up resources such as test data, test scripts, and testing packs. However, training can be completed in hours so that test teams can become productive quickly. The product can be implemented out-of-the-box for testing of any GUI, or Web browser-based application. Original Software has a suite of products that integrate modularly with each other, so TestDrive can be integrated seamlessly with the test planning module, TestPlan, the server-side solution set, TestBench, and TestSmart (this helps create data sets for feeding into TestDrive), or it can run stand-alone. The TestDrive-Assist sub-component of TestDrive, is also available independently.

TestDrive is designed to be used by anyone in the development team, from programmers to QA, to the user acceptance testing team. Initial training is provided on site by an Original Software product specialist, with the objective of providing product training and leaving the client with a set of resources for testing their applications.

Ongoing technical support is provided through classroom training, telephone support, online support, Web-based conferences, annual user conferences, and individual testing consultancy.

TestDrive works with many applications on the Windows platform, including any combination of .NET, Java, Java Server Pages, Perl, Python, PHP, and Ajax. Supported databases include DB2/400, , and Sybase.

The basic pricing structure for TestDrive is an upfront payment of US\$9,500 per concurrent licence, including TestDrive-Assist. TestDrive-Assist on its own is US\$3,000. The licence can be added/transferred/removed as required. Multiple-licence discounts may apply in certain cases. TestDrive also integrates with other Original Software modules, and these have separate pricing structures. Maintenance and support is available at 20% of the list price per-annum. This includes telephone support, online support, free product upgrades, and access to customer resources on the product Web site.

The average customer engagement lies between US\$100,000 – US\$200,000, of which 75% is product licensing and maintenance costs, and 25% covers installation and initial training/consultancy costs.

PRODUCT STRATEGY

The target market for TestDrive is any software development workshop needing to invest in testing tools. These will range from software houses, integrators, and consultants, to organisations with custom development departments. TestDrive-Assist is particularly attractive to organisations that are not yet ready for full automation practices delivered with TestDrive. However, manual practices have limitations and customers, once acquainted with the company's products, can evolve to full automation. In Butler Group's opinion, the introduction of TestDrive-Assist is a wise move by Original Software, providing a stepping point between manual and automated-testing processes.

Original Software finds that compliance is the big driver for more efficient software testing, particularly in the financial and healthcare industries where regulations such as Sarbanes-Oxley, HIPAA, and Basel II, place burdens of proof on the integrity of systems and data. In these situations test automation has a strong role to play and are good markets for the products.

ROI results from savings on time and money by accelerating the development process in the testing phase. Reducing the bug-rate in products delivered to the market reduces patch and update costs as well as improving the product brand. Original Software has example case studies on its Web site that cite ongoing annual resource savings of between 60%-90% for a standard installation. In dollar terms this varies widely but equates to an average annual saving of around US\$300,000, according to the company.

Original Software aims the product at companies of any size, but finds that customers favouring the solution tend to be the more mature, 500+ employee enterprises.

The key market opportunity for TestDrive is overcoming the existing time-consuming and inefficient-current testing practice. Manually written test scripts need a high degree of maintenance and specialist programmers to produce them, whereas TestDrive is aimed at testers who do not need to become programmers. TestDrive is accessible to anybody, including non-technical end-users. Additionally, major standards bodies are mandating testing for certain applications within many industries.

The competitive pressure of the markets is also driving companies to develop and release more products faster. TestDrive enables these companies to achieve their demanding schedules without having to sacrifice on adequate testing.

TestDrive is sold direct in North America, the UK, and Benelux, and through selected channel partners, complementary technology vendors, and testing services providers, located globally. The key business partnerships that support the product include Aldon, Examiner (Sosy Group), and Inventest. Key technology partnerships include , , , and selected testing service providers and tactical software distribution companies.

The product release strategy is a two-part approach. First, the product is available as an off-the-shelf purchase, either direct from Original Software or through partners and resellers. Second, customers using Original Software's previous GUI and Web-testing products have an opportunity to upgrade to TestDrive for free.

In the pipeline are enhancements to TestDrive, such as spell-checking, link-checking, and mark-up/annotation, which are already available in TestDrive-Assist, as well as increasing automation capability under varying application configurations.

COMPANY PROFILE

Original Software is a privately-owned company, headquartered in Basingstoke, UK, and with a US office in Westmont, Illinois. The company was founded in the UK in 1997, and expanded to North America in 2001, and specialises in software test automation.

Original Software currently has 15 employees located in the US and 30 at corporate headquarters in the UK. Head office resources are roughly 40% research and development, 20% support, 25% Sales and Marketing, and 15% Administration. The company expects employee growth in the next 12 months to be approximately 30%.

Key clients include: **Capital One** – used TestDrive to test its key finance applications during a major middleware upgrade; **Circuit City** – used Original Software to test a key new -based point-of-sale application set; and **Cargill Global Financial Solutions** – applied Original Software products to automate, improve, and accelerate the testing of its key global financial applications. Other customers include: , , , Fedex, DHL, and CostCo.

The TestDrive suite is used by almost 250 companies globally, and the total customer base is more than 400 customers, worldwide.

SUMMARY

Original Software's automated, programming-free approach to system and load testing promises to re-shape the testing landscape. The shortcomings of existing technology are evident in the often poor quality software that is being delivered today. Manual scripting places a large burden on maintaining the scripts, from the need to hire specialist programmers to managing updates. TestDrive offers a GUI for building auto-scripts that can then self heal as the application changes through the development lifecycle. This approach frees IT and QA staff to focus on testing strategies, rather than on the writing of scripts. The product will work with most application front-ends, including .NET, Java, and green-screens.

The application development community is undergoing a renaissance in testing, largely through the influence of Development and its emphasis on TDD. TestDrive fits neatly into this movement by strengthening the remaining weak link: system and load testing. Butler Group believes that organisations, which are serious about their testing strategies, should consider TestDrive.

TestDrive-Assist, the latest addition to the Original Software portfolio, offers assistance to manual testing practices and provides a useful mid-way point to full automation. Butler Group believes that the use of this product provides a good introduction to the automation capabilities that are offered by Original Software.

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DATAMONITOR

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