

Risk-Based Test Automation from a Business Process Perspective

Automating the testing of critical business processes enables you to manage change more effectively.



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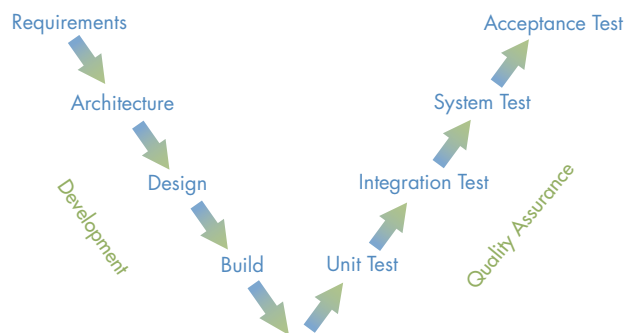
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Executive Summary

In a highly competitive business environment, information technology (IT) can provide significant advantages—enabling companies to work more efficiently and effectively, speeding time to market for products and services, and improving customer care.

With IT delivering such key benefits, organizations must be able to rely on their enterprise solutions without fail. Having systems break or business processes be disrupted because of the rapid pace of change can be very costly both in terms of lost revenue as well as lost customers. Change can be caused by business factors, compliance requirements or technology updates—or a combination of the three. But regardless of why change occurs, it's essential that you be able to remove the guesswork and have a reliable way to assess the impact of potential changes on your enterprise systems before you put them into production.

Test cases should be focused on verifying that end-to-end business processes work correctly and not merely on evaluating whether the software meets its functional requirements. Your tests should be automated, so they can run with a minimum of human intervention in a “lights out” mode. And automated analysis techniques should be used to identify the impact of system changes on critical business processes.



Traditional software testing (V-Model) does not focus on highest risk to business or lowering TCO

This white paper examines how you can improve your risk-based testing without automating thousands of existing manual test cases, how finding the right automated testing tool can help you match your frequently used business processes against pre-built test content to save time and money, and why validating critical business processes will enable you to better accommodate change for greater success as well as reduce the ongoing operational costs associated with running your enterprise systems.

Change Drives Business Innovation

Change is a constant in business. Sometimes it's caused by a major event—a merger or acquisition, or by threats such as a competitor's introduction of a new or improved product that jeopardizes your market position. Other times, change may be something you initiate to capitalize on a business opportunity. Regardless of why change occurs, effectively managing and implementing it is essential to your ability to innovate—and innovation is key to business success.

There are three critical drivers for change events that typically exist in most business environments where packaged enterprise applications such as SAP are used:

- ▶ **Business drivers**—New or revised business processes, acquisitions or reorganizations, agreements with vendors, product development, and so on
- ▶ **Compliance drivers**—Changes to industry-specific standards, risk-management mandates, compliance rules and regulations such as Sarbanes-Oxley, SEC or FDA regulations, or other laws requiring your action
- ▶ **Technology drivers**—Software service packs, upgrades or new releases from your vendor that add functionality, provide new capabilities, improve maintenance, or are rolled out from one region to another

If your company currently runs SAP or other enterprise solutions, you know that change will have a significant impact on your computing environment. It's essential that you're able to quickly and efficiently manage change so that your platforms will support you without the risk of catastrophic breakdowns that can have a devastating impact on your business.

Riding the roulette wheel

Too often, companies adopt an ad-hoc approach to managing change. Developers tend to focus testing efforts primarily on the product features being added or code that will be changed. They then guess at what other functional or business areas the software upgrades might impact. Finally, ad-hoc tests are run to test the changes to business processes that are deemed to be impacted. But basically, it's still a spin of the wheel approach to managing change. And that can be an enormous gamble—one in which you'd literally be betting the future of your company.

The Need for Impact Analysis-Based Testing

Most traditional software testing is designed around how the software is built. Basically, you define a set of functional requirements and then specify manual test cases that are based on those requirements. Over time, companies often create thousands of different test cases—each testing some aspect of the functional requirements defined for the software to be built. Functional tests are typically done in silos and do not cross functional boundaries where problems are most likely to arise.

This is perfectly acceptable—if you're in the software development business. But assuming you're in some other business—manufacturing, finance or health care, for example—and your focus is on using software to run your business more effectively, you need a better, more cost-efficient way of ensuring that your business processes will continue to operate properly when you implement software changes.

Mindlessly Automating All Manual Functional Tests Is Not the Answer

Many people approach automated testing by simply trying to convert thousands of existing manual functional tests into automated tests.

Errors that can disrupt business processes typically tend to occur at handoffs or breakpoints between functional areas. Corporate IT environments are becoming increasingly complex. Simply automating your existing manual test cases based on functional/departmental scenarios tests whether specific SAP or enterprise software functionality is operating the way it should—not whether your end-to-end configuration, including all the connections between your SAP platform and your other systems, is working properly. In the meantime, you will have invested a substantial amount of your finite staff time and limited budget into the effort to automate these tests.

Your goal, then, is not traditional quality assurance (QA) focused on whether SAP or any other enterprise software works. The vendor that supplies you the software should be doing this, and by all measures is better equipped to do so. Your objective, rather, is to verify your end-to-end business processes, and to ensure that your critical business processes will run as required once changes have been implemented within your enterprise applications.

End-to-end business process testing has the following primary characteristics:

- Designed around how your software is really used
- Focused on the areas of greatest risk to the business
- Has the ability to rate defects by their overall operational impact
- Provides a more efficient and cost-effective path to testing your business processes

It's important that the testing you implement can run in "lights out" mode—that is recurring, automated and unattended. But it must also be focused on this broader perspective of business processes.

Comparing Traditional QA to Business Process Testing

The following table provides a comparison of traditional QA approaches to testing designed for end-to-end business processes:

	Q/A	BPV
What assets are built?	Test Cases ➤ Based on system design, requirements, issues	Business Processes ➤ Based on business processes, risk to the business
What is the scope?	Functional Areas	End-to-End Processes
What is measured?	Software Defects ➤ System failures	Operational Issues ➤ Process failures
What is the objective?	Find Software Bugs	Protect Business Processes
Who is the customer?	Development	Business
What is the value?	Software Quality	Operations Assurance

Once you recognize that your goal is to ensure that the end-to-end configuration of your IT environment—especially the connections between your various systems and your SAP solution—is working correctly, you're in a position to truly help the business.

Now you need to identify precisely what these most critical business processes are. When analyzing any typical company, the first thing that becomes apparent is that there aren't nearly as many critical processes as one might have imagined. Few, if any, companies have thousands of these processes. Most large companies might have between 200 to 300 critical end-to-end business processes. So, that gives you a much more manageable situation to deal with.

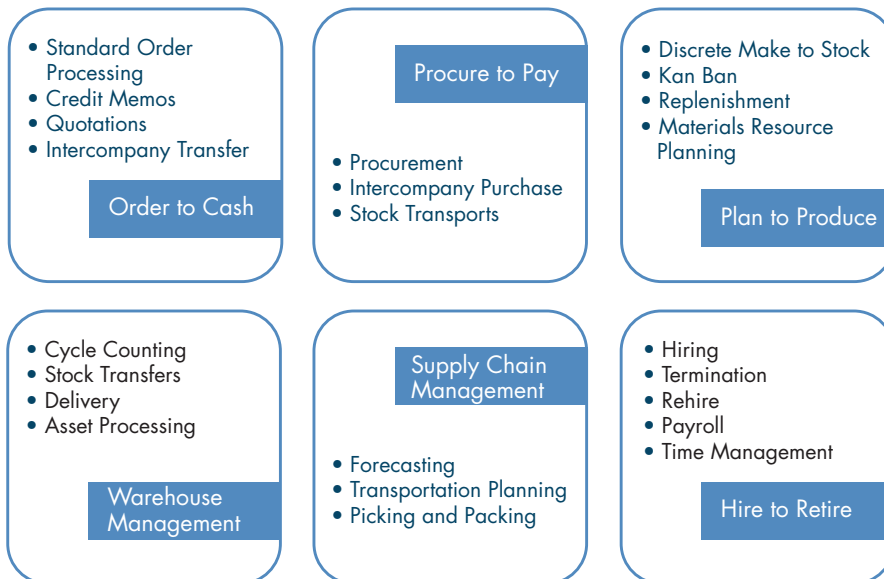
Breaking Down Business Processes

Let's take a real-world example: In an analysis done for a large semiconductor company, it was found that around 24 SAP transactions (TCODEs) covered 80% of the company's most critical business processes in its sales and marketing area. Most variations in the business processes were just different sequences of these 24 transactions. So, if automated tests could be constructed for these transactions and then sequenced together in multiple flows, the company realized that 80% of their core processes could be effectively tested in that business area.

Extending this to other areas of the company, one would see similar efficiencies. Clearly, this is a much more manageable challenge than having to wade through hundreds or thousands of manual test cases that perhaps you've been using in the past, and try to automate them all. And remember, even if you did have the time and human resources to accomplish this, you would still not be addressing end-to-end business processes.

Finding the Right Automated Testing Tool

Once you have successfully identified and analyzed your critical business processes, you need a tool that can help you create automated test cases. One such solution is Worksoft Certify, which enables you to automate testing without having to write code to do so.



Identify critical business processes to achieve testing efficiencies

One of the biggest benefits of relying on a data-based—rather than a script-based—model is that you can leverage the power of a relational database to simplify the development and maintenance of test processes. By maintaining relationships among your test assets, a change to any element can be traced to related items, so you can quickly identify potential issues and analyze the impact of changes to an application on all affected test assets. This allows you to automate a larger percentage of your business processes and do so earlier in the project cycle, saving time and resources

In addition, because Worksoft Certify is a leading automated testing solution for cross-platform business process testing that includes SAP-based environments, Worksoft has amassed a vast library of pre-built test content for standard SAP business processes that apply to businesses like yours. These pre-built test cases may have to be modified somewhat, but in most cases, 60% to 70% of the work required has already been completed.

Aligning Pre-Built Tests Against Your Existing Business Processes

ST03 data from SAP can be used to identify frequently used transactions. Worksoft provides all the tools you need to map this data against the pre-built library of SAP test content to see which tests already exist and which you will need to build. A color-coded illustration lays out the matched business processes and sub-processes, helping simplify the identification of these tests and making it easier to scope the effort required to complete your entire automated test bed.

Once you have finished building the automated tests, you're ready to run them against your system. And of course, because these tests are automated, they will run in a small fraction of the time it would take to run them manually. In the past, you may have had to gather four or five people with various expertise to manually go through test after test. With "lights out" automated testing, you simply push a button and the tests run without any human intervention. Within a few hours, you can be confident that if planned software changes within one or more transports have passed the tests, your critical business processes will not be adversely impacted when you put the changes into production. You can run automated tests as often as you like, where previously this was a cost-prohibitive and therefore less frequent activity.

Leveraging Test Content for Risk-Based Testing

Because the testing is so fast, one strategy for using the scriptless automated testing in Worksoft Certify is to run the tests weekly for 80% to 90% of your core business processes. This provides you the assurance that those business processes will continue to perform as expected, even with constant changes being implemented within the company's SAP environment.

But what many companies do is efficiently leverage the tests to improve the quality of their change management effort. Any time a change is planned, you can apply automated impact analysis to determine how objects inside your SAP transport are likely to impact your core business processes and then filter the automated tests you need to run based on this analysis.

Impact Analysis Techniques

Impact-analysis testing can be applied in two ways: using static analysis or dynamic analysis.

STATIC ANALYSIS—Static analysis is used to analyze the objects in your transport to determine where they are used in your SAP system, most notably which programs and transactions use the objects being changed. With the help of intelligent filters, the software can then construct a reverse tree to roll up to transactions and programs that are using specific objects, in order to determine which business processes could be impacted. This analysis is straightforward, with the software handling everything for you. However, certain dynamic behavior can be missed by the analysis so it is not completely foolproof.

DYNAMIC ANALYSIS—In dynamic analysis, business processes are run in a special trace mode within your SAP application. SAP collects a list of all objects that are used when a particular business process is run. This list is known as a technical bill of materials (TBOM)—this is how SAP's Business Process Change Analyzer (BPCA) works. If an object in the transport matches one from the TBOM, then that business process will be impacted by the change. Dynamic analysis is more difficult to implement, in part because you must keep the object list or TBOMs for each business process up to date over time. But this is a much more accurate way to analyze the potential for change-related issues with your business processes.

Bringing It All Together

With all of these tools at your disposal, what's the best way to bring everything together? Worksoft Certify Impact is a web-based application that wraps everything up by enabling you to quickly and efficiently identify potential changes, assess their impact on your business processes, identify the end-to-end tests that need to run and finally, run the automated tests against your SAP system to test the affected business processes prior to promoting the changes into production.

Worksoft Certify Impact allows you to select one or more transports based upon any criteria—for example, those that you may be responsible for, key words in the description, a date range, and so on. You can then choose to run either a static analysis or trigger a full BPCA analysis. This analysis specifies which programs and transactions are likely to be impacted and then automatically identifies the appropriate tests that need to be run. Once these tests have been run, you receive an e-mail listing which processes passed and which failed.

These analyses can be run whenever you desire, and the person responsible does not need any programming expertise to run them. All he or she needs is to open the program in a browser, identify the transports, and push a button to run the tests.

Conclusion

Knowing that change is inevitable, the only question is how your company can accommodate change more effectively without major disruptions of your business caused by system breakdowns. Traditional QA tests provide little value—proving primarily that the software functions as it should, but not providing any meaningful information about whether changes that you may be considering will create significant issues for the critical business processes you rely on to serve your customers.

The costs of guesswork can be enormous—and with the right data-based, automated testing solution, the time and expense of running “lights out,” process-focused, dynamic test cases can be quite manageable. Worksoft Certify provides businesses running SAP and other enterprise applications the ability to manage risks and costs, while ensuring that essential business processes will remain available and reliable for daily operations.

About Worksoft

Worksoft® is an innovative, global provider of automated testing solutions for packaged enterprise applications. Companies utilize our solutions to help to cut project timelines and reduce operational costs by automating functional testing, performance testing and change management. Headquartered in Dallas, Texas, Worksoft customers include blue-chip companies across manufacturing, financial services, government, healthcare, retail and transportation. For more information, contact Worksoft at 1-866-836-1773 or visit www.worksoft.com

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