EXECUTIVE SUMMARY

Proactive, consistent quality management for business-critical applications is increasingly a key goal of most organizations. Given the visceral impact of downtime and performance degradations in a difficult economy and the agility enabled by software such as SAP's enterprise resource planning (ERP) solutions, the demand for effective testing has never been greater. The cost savings of finding software problems early in the life cycle and effective infrastructure management for quality can be geometric in scale. In the wake of cuts to staff who work in quality over the past 12–18 months, automation (along with improved organizational and process strategies) can help increase efficiency and augment remaining resources.

This IDC White Paper demonstrates how enterprise customers can achieve significant return on investment (ROI) for their SAP software quality management strategies by implementing effective automated testing solutions. To validate and quantify the business benefits of quality management using testing solutions for SAP, IDC interviewed IT executives at a sampling of 10 SAP customer sites in North America and Western Europe. IDC asked a series of questions about SAP test management processes associated with SAP applications and the impact of testing products for SAP on capital expenditures and operating costs, IT staff time requirements, and application user productivity. See Table 1 for an overview of results.

### TABLE 1

Three-Year ROI Analysis per 100 Users

<table>
<thead>
<tr>
<th>Benefit (discounted) $56,439</th>
<th>Investment (discounted) $10,627</th>
<th>Net present value $45,812</th>
<th>Return on investment 431%</th>
<th>Payback 3.9 months</th>
<th>Discount rate 12%</th>
</tr>
</thead>
</table>

Source: IDC, November 2009

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SAP customers interviewed for this study reported benefits from SAP testing solutions in four primary areas: IT staff efficiency, increased SAP software availability for user productivity, reduced costs in a range of areas, and business benefits. The average annual value (per 100 users) of these benefits was $23,516.
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IN THIS WHITE PAPER

This ROI study identifies the quantitative and qualitative benefits of SAP testing automation. Organizations invest significant amounts in their core applications for implementation and customization. Businesses depend on applications for adaptability and survival now more than ever. Given the current challenges and seismic shifts in our global economy, reliance on effective software and enterprise applications has never been more obvious or more impactful. As organizations strive to succeed with increasingly constrained business and IT resources, it becomes vital to focus on effective software quality. This paper lays out the benefit and ROI that application quality organizations and SAP testing play in establishing effective businesses and cutting costs. We also consider leveraging an automated testing strategy in the context of resource and financial demand management for enterprise applications and changes to quality management of SAP-centric solutions as a driver for test activities.

NEED FOR SAP TESTING SOLUTION

As organizations struggle with fewer resources and as they rely on their SAP applications to run their business, quality management for SAP deployments (including customizations) becomes all the more important. SAP offers a series of products and services related to quality and coordinates as well with a number of third-party testing partners to augment core offerings.

SAP offers two primary options for users seeking to coordinate an approach to the testing life cycle, from management and process planning to test automation:

- **Option 1** includes SAP Solution Manager, with functionality, to help set up the business process catalog and business requirements (referred to as “business blueprint”) and a business process change analyzer, which helps identify processes affected by code changes and customization changes. Additional software in Option 1 includes a test workbench for test planning and SAP Test Data Migration Server (TDMS) software to set up current and leaner test data content and management. For many customers, it is expensive and challenging to have current and appropriate data available for testing — SAP TDMS helps address and manage that process. Option 1 also includes SAP Solution Manager integration with SAP’s test workbench to help manage manual tests. For automated tests, SAP Solution Manager integrates with its own extended computer-aided test tool (eCATT) as well as third-party UI-based testing products such as HP QuickTest Professional and TestPartner from Compuware Corporation (TestPartner was acquired by Micro Focus in 2Q09).
Option 2

BENEFITS

Since deploying SAP testing solutions, customers interviewed for this study had established a systematic approach to testing and built a structured methodology around their testing practices. As one customer said, “When you are using SAP testing tools, it is important to create a process design. The main point is to build something that is consistent across all of your users, especially if that is a large number of people.”

With testing solutions for SAP, users can gain a better and faster understanding of how the test procedures are working as well as helping to eliminate errors that would otherwise make it into production. As one customer said, “Before [bringing in] SAP testing tools, our preliminary testing was all just paperwork and ideas. Getting through these tests with a systematic approach helps us to correct misunderstandings up front, and that is a real boost for the project because there is less confusion.” It was also mentioned, “Users see what they have to do, and they perform those tasks in the correct order. Since we deployed SAP testing tools across our staff, we saved about 20% of their time.”

Customers mentioned that using SAP test automation was essential because of the number of people performing tests and the complexity of those tests. As one customer mentioned, “We tried doing the tests on several projects without SAP testing tools and had quite bad results [for software] quality when we went to production.”
Customers in this study reported benefits from SAP testing solutions in four areas: IT staff efficiency, increased availability (user productivity), reduced costs, and business benefits. The average annual value (per 100 users) of these benefits and their proportions are shown in Figure 1. IDC calculated these values in terms of per 100 users so that organizations can roll the values up to the size of their company.

**FIGURE 1**

Average Annual Benefits of SAP Testing per 100 Users

<table>
<thead>
<tr>
<th>Benefit Area</th>
<th>Average Annual Benefit per 100 Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business benefit</td>
<td>$677</td>
</tr>
<tr>
<td>Cost reduction</td>
<td>$3,084</td>
</tr>
<tr>
<td>Downtime/ user productivity</td>
<td>$6,901</td>
</tr>
<tr>
<td>IT staff efficiency</td>
<td>$12,854</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$23,516</strong></td>
</tr>
</tbody>
</table>

Source: IDC, November 2009

**Specific Benefit Areas**

*IT Staff Efficiency: $12,854 Average Annual Benefit per 100 Users*
test cycle time has been reduced by 54% on average, from 1.7 weeks to three-quarters of one week.
As an IT manager said in the interview, “It is likely that users in two of our key departments used to suffer downtime from typical bugs in production. Each outage would have been about eight hours of downtime, but their performance would have suffered for days or even weeks. On the whole, their productivity has been improved by at least 25%.”

Cost Reduction: $3,084 Average Annual Benefit per 100 Users

Cost reductions were found in the following areas: avoided spending on infrastructure (reduced spend on disk space in the test environment), hardware savings/avoided hardware purchases, and savings on travel.

The majority of the cost reduction benefit stems from savings that customers experience regarding testing infrastructure. In the past, SAP customers tried to manually enter data for testing, using physical machines and actual users for performance testing, or attempted to create and mirror full copies of the production databases. The costs that either of these methods adds to infrastructure spending are significant. One customer’s company houses a production database over 2 terabytes (TB) in size. As a manager at that company said, “The cost requirement to create a 2TB test environment, the additional space involved alone, would not allow us to continue down that path.”

Another customer estimated that mimicking the organization’s production infrastructure would cost over $1 million. But by using SAP testing tools, the organization can use 25% of the data in production, reduce the cost of the test environment, and save disk space. This company estimates that it will save nearly $2 million in infrastructure costs because of the SAP testing deployment.

The ability to perform tasks remotely offers value to SAP customers. As one manager said, “There is definitely an impact on travel. For debugging, we can do everything remotely. We avoid people having to go out to remote locations to facilitate tests. With this tool, we just send them a box and they make sure that it gets plugged in.” In this study, customers are saving an average of $10,100 per year in travel expenses.

Customers have also avoided adding new staff and can more efficiently deploy existing teams. Automated testing for SAP allows customers to avoid administrative overhead, and users no longer have to work with rigid and fragile reporting systems such as spreadsheets. As mentioned in one interview, “Right now, we have two people per year doing testing. But if we did it manually, we would need much more time because of the coordination involved, and we would need six to eight more people.”

Business Benefit: $677 Average Annual Benefit per 100 Users

Allowing fewer errors into production has an impact on users and the business overall. While the extent of this impact is dependent on the size of the error prevented, related code dependencies, and business criticality and visibility of the impacted software (along with the length of downtime), business agility and survival is linked to the software on which it depends. It always benefits a business when its users have access to systems that allow them to generate revenue and run the organization. The costs of downtime for customer-facing applications can be...
Astronomic. As one IT manager said, "If we have bugs that harm the system, our users will not be able to execute queries. This means they cannot access our inventory and are then unsure if they can make that sale. If our users lose that ability, we're losing money." For customer-facing software, the potential revenue loss, customer loss, and cost to company brand are real in an economic environment where the competition is a click and a screen away for disgruntled users. For critical internal-facing applications such as financial management, the costs of downtime impact company agility and success in other key ways. The bottom line is that because businesses are dependent on SAP software for their internal functioning and external outreach to clients, effective quality, functionality, and optimized performance are necessities for core applications.

**CASH FLOW OVER TIME**

Figure 2 illustrates the annual benefit, annual investment, and cumulative cash flow over three years. Benefits increase slightly over time as IT professionals tend to become more familiar with what the testing solution can offer. Investments are highest in the first year. New software purchases require both IT time for deployment and consultants to assist in the implementation. Once the initial costs are accounted for, investment in the following years declines and levels off over time. Ongoing investment is based on standard hardware turnover rates and the IT time required to maintain the hardware.

**FIGURE 2**

Benefit, Investment, and Cash Flow per 100 Users

Source: IDC, November 2009
The three-year IDC ROI analysis is based on initial and annual investments compared with the benefits over the three years. Based on the data gathered from customers, the SAP testing solution offers an ROI of 431% and payback occurs in 3.9 months.

IDC conducted in-depth interviews with 10 companies using automated testing solutions for SAP. The IDC ROI methodology is based on gathering data from current customers. IDC performs a three-step process to calculate the ROI and payback period:

1. Measure the financial benefits from reduced costs, increased IT staff productivity, and reduced downtime.
2. Ascertain the investment made in the SAP testing solution and the associated training and ongoing support costs.
3. Estimate the costs and savings over a three-year period and calculate the ROI and payback for the deployed testing solution.

Because the full benefits of the SAP testing solution are not available during the deployment period, IDC prorates the benefits on a monthly basis and subtracts the appropriate amount for the deployment time from the first-year savings.

IDC uses a discounted cash flow methodology to calculate the ROI and payback period. ROI is the ratio of the net present value (NPV) and discounted investment. Payback period is the point at which cumulative benefits equal the initial investment. IDC uses a standard 12% discount factor, which allows for risk and the missed opportunity cost that could have been realized using that capital.

Profile of Respondents

IDC interviewed 10 companies that have deployed and used solutions for SAP testing for at least one year. These companies ranged in size from 350 employees to 18,000 employees, and all are located in North America and Western Europe. The demographics for the customers are presented in Table 2.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Demographics</th>
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CHALLENGES AND OPPORTUNITIES

SAP’s evolving road map combined with partnerships can facilitate this evolution.

CONCLUSION

Drive Business Agility and Manage Complexity as the Economy Shifts
Companies must evaluate current approaches and gaps to establish appropriate strategies for testing organizational structures, with staffing roles and responsibilities as well as center of excellence (COE) creation — including its relationship to distinct testing groups. Some companies will require tactical organizational strategies where no separate QA group or COE is possible due to human and/or financial resource constraints. Context is key. Where are the pain points highest for quality initiatives? Where are the greatest problems, and where should the focus be first?

Against that landscape, organizations should evaluate the alternatives available for automated software quality (ASQ) products, services, and best practices as part of an overall life-cycle approach. Tool adoption must be accompanied by appropriate practices, methodologies, and organizational structures. Where enterprise applications are key to corporate strategy, tools must specifically address current software functionality and closely align with the evolution of emerging strategies for companies such as SAP.

CASE STUDY

Global Food Processing Organization

IDC was able to share the experiences of a global food processing organization under the condition of anonymity. Headquartered in North America and marketing in over 90 countries, the organization operates in a demanding and competitive industry. The organization had been using SAP for around two years when it evaluated and then brought in SAP TDMS as an automated system to help refresh its test landscape and test infrastructure environment. The organization implemented TDMS to augment its existing ASQ solutions from HP (Test Director, LoadRunner, and QuickTest Professional). It also uses SAP's eCATT for limited security script creation.

With over 10,000 SAP users — the organization runs its core business on SAP — overall, the IT staff numbered 1,300 with around 30 supporting SAP applications. The combined use of automated testing tools has enabled the organization to increase its testing efficiency in a variety of ways.

Prior to bringing in SAP TDMS, the organization had a significant project testing backlog. Typically, it took about two weeks for the staff to do test landscape refreshes with six full-time equivalents (FTEs). Now, it requires merely five to seven days and essentially one person using TDMS. The tool has also reduced disk utilization considerably. Before bringing in TDMS, the organization's staff would copy a production system. Now they don't need to; they merely refresh TDMS with a subset of data. Therefore, they currently have multiterabyte systems that can be segmented and brought down to just 0.5TB or 1TB. Because they perform testing refreshes for each system at least twice a year, and there are nine systems in a landscape, the savings are significant.
As a result, staff have more time to focus on other areas, such as debugging code. The organization also described reductions in the amount of general downtime. For nonproduction systems, there tends to be a negative impact initially as quality assurance sorts through early issues and problems. But on the production systems, they are now previewing, testing, and using real data for work in the nonproduction systems. Therefore, there is increased reliability for production systems as better code and better code deployment configurations are established. As was discussed earlier, cost savings result from nonproduction systems being smaller than they would be normally without TDMS.

With downtime prior to automated testing deployment along with TDMS, users did some things manually and were around 40% less productive. (Additional problems in deployment resulting from poor quality assurance also resulted in cost increases.) The implementation went fairly smoothly, with a combination of SAP consultants, 5 FTEs, and 100 people testing and validating the product, which was deployed and in use after six months. Now that a single TDMS user does the test landscape refreshes, the staffing efficiencies are significant, with ROI building over time. The organization repurposed existing servers to run the product and is finding that support and maintenance is only around 20 hours per year (primarily to complete patching cycles).

While there were initial problems with user acceptance, the issues were more emotional than technical and centered around transitioning away from what had been done previously. After using the tool in the production landscape for the first time, the teams finally realized that they had to adopt a new approach to testing, and they made the transition. Now there aren't acceptance problems. The teams are used to contributing within the testing landscape framework they've put in place. After they finish using the tool, it resets their environment and copies data back to them; it's a "test data migration service." Then users have a period of time when they have to identify issues and make sure that their platform is functional and will meet the demands of the project for the particular time frame. Thus, TDMS, in combination with test automation, gives users the ability to open up visibility into defects. And there's what they call a "warranty period" during which they accept all blame for code problems — until they can prove that it wasn't their problem.

From an organizational perspective, they are more conscious of the actual quality of the work they are doing now. There is visibility into a shift in the testing process from the point at which testing the data works to the point at which there are data changes or other changes and the test no longer "works." The tests are usually set up to be predictable to support the way in which the software was coded. However, this process introduces change that recreates what may be unpredictably experienced in production — a small dose of potential reality because the system looks like production. Users become a little more conscious about making their configurations and their code actually work with "real" data environments.

The development teams are both more efficient and more confident about their deliverables because they know that the code will work in production because they've actually had the opportunity to test "in production."
It took a little while to get to that productivity point, however. About four months after production, there was a point of disruption as users initially lost 10–12% productivity while they learned by experience how to use and benefit from quality automation and the TDMS system. Since then, they are more productive simply because they aren't spending as much time troubleshooting production issues. They have realized commensurate productivity gains now of around 10–12%, and support staff have also seen significant productivity improvements.

The bottom line for the organization for its investment in and use of these combined test automation products is that the quality of its SAP applications has improved, but the number of staff has not increased. The teams at the organization believe this is a direct reflection on the amount of effort that it takes from an automation perspective to deliver these applications. It has given them the ability to get more accurate results. They spend more time retesting, but they have not gotten to the point where they are comfortable reducing that time. They are finding more problems 20–25% earlier.

While a typical software project would previously experience 200–300 errors getting into production, there has been a nearly 30% reduction in those errors because they're being found at quality assurance time. This reduces resolution time and work required to repair defects and lessens the negative impact of code problems for over 10,000 SAP users.