Three New Technologies That Will Disrupt Your Test Organization

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New technologies such as Cloud, SOA, and multi-tenant systems boost ASP and BSP sourcing models. This fundamentally changes the task portfolio and staffing needs of test organizations. CIOs prevent quality and cost problems by initiating the change process early.

Test centers are at the end of a chain. They provide services to the IT department, which supports the company's core business. Any change at the beginning of the chain (i.e., the business model or processes or the modus operandi of the IT department) can affect the test center. Thus, the first of our four theses focuses on the IT department and the business in general.

Thesis 1: Three new technologies boost new sourcing models.

The combination of three new technologies eases fine-granular outsourcing. First, there are **Web services and service-oriented architecture (SOA)**. They allow one to outsource single process steps. This does *not* affect straight-through-processing. In a bank, the property valuation in a mortgages process would be a single step. In an SOA landscape, the mortgage process calls a Web service for the property valuation. An external IT service provider (ITSP) runs the service on its servers. The process itself and all other steps run in the bank. This is outsourcing that is much more fine-granular than in the past. In the past, outsourcing took place on the scope of the complete mortgage process or even all credit applications.

The second game-changing technology is **multi-tenancy**. Multi-tenant systems are important for ITSPs. An ITSP can host many clients on one installation. For example, Swisscom hosts a core-banking installation shared by many independent banks. Their data are strictly separated. This brings costs down per bank much more than other cost-cutting approaches such as laying off staff or improving processes.

The third game-changing technology is the **cloud**. New service providers for B2B or B2C services can enter the market without big IT investments. Purchasing servers and managing data centers are left to global cloud providers such as Amazon or regional ones such as Swisscom. B2B or B2C service providers "rent" storage, computing capacity, etc., on demand. They benefit from IT costs and businesses growing at the same pace.

Web services/SOA, cloud, and multi-tenant systems together ease market entry for new B2B/B2C services and service providers. At the same time, service consumers such as banks can integrate them easily into their IT landscapes and processes. This is a self-reinforcing effect.

It is crucial to understand how "buying standard software" and "integrating a service" differ. A service is software *plus* operations. The ITSP manages everything: employees, hardware, and software from development to maintenance to deployment. The ITSP ensures that the service is up and running. This is often called "application service provisioning" (ASP). One step further is that the ITSP takes over the business processes, e.g., scanning checks or typing in orders into the

systems (business service provisioning, BSP). No matter whether ASP or BSP is used, both affect the test organization.

Thesis 2: A change from custom to standard software impacts the test organization less than a change from standard software to ASP or BSP.

This thesis might be surprising. Internal software development needs much testing. The point is that the test *organization* does not perform all tests. It depends on the kind of test:
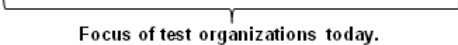
- *development-near tests (unit and unit integration tests).* Developers perform these tests. Sometimes, the test organization provides infrastructure such as test automation or bug tracking tools;
- *application-as-a-whole tests (system and system integration tests).* These are the core work of testing organizations. They look at the complete system and its interaction with other systems. System tests are needed for custom software and also for complex standard software that is error-prone to configure. System integration tests are needed in any case;
- *business-near tests (user acceptance tests and after-deployment checks on production systems).* The tests check whether the system meets the daily needs of the users. The business and business users are in the lead. The test organization supports in planning, tooling, or methodology, if it supports at all.

If IT departments move **from custom to standard software**, development-near tests vanish. This is work (mainly) done by developers. The impact on the test organization is limited. Standard software is tested by the vendor. There is no need for the classic system test, which are replaced by testing customer-specific parameterizations. This is quite some work for complex systems such as core-banking and ERP systems. When looking at the other tests– system integration tests and business-near tests – moving from custom to standard software has no effect. To conclude: Standard software reduces the workload of the test center. It does *not* threaten its existence. Also, many companies already run a lot of standard software. Thus, their test center staffing is adjusted.

Moving forward to **ASP and BSP sourcing models** impacts the test organization more. ASP eliminates all system tests. The system is "ready to use." If it is coupled with other systems (e.g., via Web services), system integration tests remain. Some companies go even one step further by outsourcing IT completely ("full ASP"). No IT means no testing. This is a typical scenario in, for instance, small and medium-size Swiss banks. If a company moves to BSP, this also heavily affects the test organization. All tests of the *particular* area (e.g., payment processes) vanish, although the test organization itself is not in question. Figure 1 summarizes this discussion.

Both ASP and BSP have severe impacts on testing. No matter how quickly they spread in an IT department, the test organization must plan ahead.

	Unit Tests	Unit Integration Tests	System Tests	System Integration Tests	User Acceptance Tests	Readiness Check in Production
Custom Software	✓ Tests needed	✓ Tests needed	✓ Tests needed	✓ Tests needed	✓ Tests needed	✓ Tests/checks needed
Standard Software	✗ Obsolete	✗ Obsolete	(✓) Configuration tests needed	✓ Tests needed	(✓) Configuration tests needed	✓ Tests/checks needed
Application Service Provisioning	✗ Obsolete	✗ Obsolete	✗ Obsolete	✓ Tests needed	(✗) Mainly an evaluation task	✓ Tests/checks needed
Business Service Provisioning	✗ Obsolete	✗ Obsolete	✗ Obsolete	✗ Obsolete	(✗) Mainly an evaluation task	✓ Tests/checks needed
Full Application Service Provisioning	✗ Obsolete	✗ Obsolete	✗ Obsolete	✗ Obsolete	(✗) Mainly an evaluation task	✓ Tests/checks needed

Focus of test organizations today.

Figure 1: Sourcing Types and Remaining Tasks for the Test stages and Test Organization (red: tasks becoming obsolete, yellow: reduced work, green: remaining tasks, grey: tasks with limited relevance for test centres)

Thesis 3: Test organizations will shrink. They should focus their investments on testing strategic applications.

The trend toward ASP and BSP and less "traditional" testing is a low-key process. This demands planning ahead. In some areas, the test organization must keep or improve its competence. In other areas, "downsizing" might make sense. A CIO close to the business knows the applications that are at risk for ASP/BSP. Often, an old question by Nicholas Carr helps, although IT departments were often offended by it: "Does IT Matter?" In our context, it could be adapted to, "Does the application matter?" An application "matters" if it helps the company to differentiate from its competitors. If it does, the application remains in-house and investing in its testing is desirable. Various ways to invest can make sense: maintaining test cases proactively, improving the test process, or securing know-how by retaining internal testers.

When applications are at risk for ASP and BSP, the test organization is in a dilemma. On the one hand, tasks might vanish. On the other hand, good quality is a must until the application is really replaced. Three approaches help in dealing with the dilemma:

- reactive instead of proactive investments;
- contractors who leave if tasks vanish; and
- managed services, which unlock internal management capacity currently occupied by the daily business to work on the problems of the future.

Figure 2 provides more details. Sourcing decisions are driven by two questions: First, does the application allows the company to differentiate in the market? Second, how long will this application remain in use?

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Sure, some IT departments are still on their way to building up a test center. In such cases, the number of testers is going to grow. But mature test organizations should expect downsizing. Still, they have chances for further development *if* they are willing to change.

Thesis 4: Today, test organizations focus on functional tests at dedicated points in the development process. The future lies in holistic, continuous quality assurance.

Many IT departments follow a software development process. Such processes define stages with quality gates. Quality gates demand that certain tests be completed before moving on. The test organization helps with testing. Such tests remain, but their extent might decrease with the advent of ASP and BSP. However, IT departments and business need more support in three areas:

- evaluating and selecting ASP and BSP services and service providers;
- defining service-level agreements; and
- monitoring the actually provided service levels.

Such services are not in the focus of test organizations, but are crucial for a future quality assurance (QA) organization. Furthermore, the QA organization can unite various tasks scattered across the IT department or the entire company. This can lead to synergies and improve governance. Some ideas for such tasks are:

- performance monitoring. Load and performance tests belong to the service portfolio of test organizations. There are other teams in the IT department that monitor the load and performance continuously, e.g., response times of Web servers. There are clear synergies for unifying these teams in a QA organization;
- IT security teams often form their own organization within the IT organization. A QA organization could improve the governance; and
- compliance-related tests such as data privacy testing and data leakage prevention become more important. Today, they are often not in the IT department. A QA department could incorporate them.

These are ideas for how a test organization can transform itself instead of mourning about the coming decline. They all require that the CIO and the head of testing are willing to leave their comfort zones and implement real change.

		Application helps company to differentiate	
		Yes	No
Long-term perspective	Yes	In-house testing with internal staff	Outsourcing/ Testing as a Service
	No	In-house testing with internal staff and contractors	Mixture of internal staff and contractors *or* outsourcing

Figure 2: Strategic Testing Sourcing Matrix

To conclude: New technologies result in more ASP/BSP-sourcing models. This results in less testing as we know it today. Test organizations should plan how to downsize and where to focus. They have the chance to move in the direction of quality assurance organizations. This requires strategic foresight. Test organizations must continue to improve their tooling, their methodologies, and internal processes. However, a CIO or head of testing who focuses only on these topics risks much. The new technologies redefine the IT value chain. The CIO together with his or her head of testing must align the (test) organization accordingly.