QA OUTSOURCING

Whitepaper
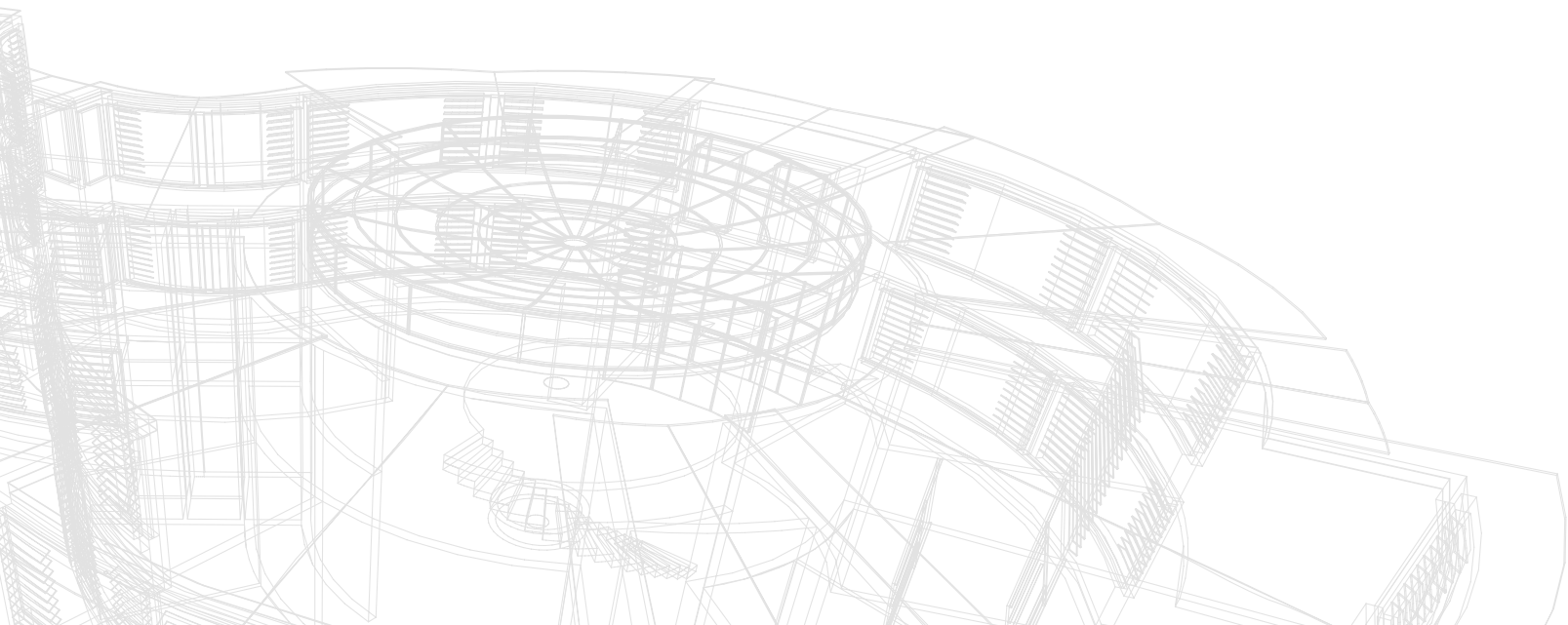
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Executive summary

According to the Russia Quality Report, organizations almost never have a dedicated test department and they lack the corresponding expertise and ability to involve a sufficient number of specialists in the testing process

Most organizations are requiring their IT directors to cut operating expenses. However, requirements on the quality of IT services remain high and are even growing with the competition on the market. Over time, a business's IT landscape becomes populated with more and more new IT systems that integrate with one another, creating new risks of failures and outages. And these are risks that cannot be mitigated without increasing the volume of testing.

Thus it seems that testing, as a necessary stage before IT products are deployed, does not fit well into a cost-cutting paradigm, since it is quite expensive. In this situation, ensuring the required quality for IT services while simultaneously lowering costs seems like an impossible task.

According to the Russia Quality Report, organizations almost never have a dedicated test department and they lack the corresponding expertise and ability to involve a sufficient number of specialists in the testing process. IT department employees and business users participate in testing to the detriment of their own immediate activities. If companies have a test department, then it almost always suffers from a shortage of employees and expertise due to the growing size and complexity of the IT landscape.

The solution to this problem that yields the optimal ratio of price to test quality is QA outsourcing provided by professional QA companies. You transfer your standard regression tests to an external company, which then becomes responsible for performing them, freeing your specialists from non-core activities. Under an outsourcing arrangement, the service provider performed the agreed upon manual and automated test, creates new test cases, and increases the amount of automation.

Without QA outsourcing, organizations have to solve the following problems on their own:

1. Increased testing costs
2. Low software quality
3. Overworking IT department specialists with non-core testing tasks
4. No ability to reduce costs by applying industry practices and test automation
5. High indirect costs due to defects in the production environment

Another problem is the fact that organizations almost never see the cost of testing as a separate budget item if they do not use outsourcing. In other words, organizations are unable to effectively manage these costs. IT managers, of course, can count up the time that the organization's own employees allocate to testing, but they cannot calculate the real increased QA costs that result from bugs being found by end users when the product is live. This problem is solved by calculating the cost of outsourcing, which shows the overall picture, similarly to a TCO calculation.

A transition to QA outsourcing lets organizations avoid uncontrollable growth in the volume and cost of testing. Outsourcing can also halt a decline in the loyalty of employees involved in performing unpopular and non-core testing work. QA outsourcing makes it possible to reduce expenses by approximately 30%. Depending on the scope of the project and the customer's willingness to work with remote teams, these savings can grow to 50%. Additionally, the customer gains the ability to use the service provider's ready-made solutions that account for industry-specific requirements.

**Transitioning
to QA outsourcing
begins with
an assessment.
Test experts
determine how much
the organization's
costs could be cut**

Outsourcing generally provides a high previously-unachieved level of test automation. This makes it possible to also reduce the time required for testing by 30%-50%. If an organization previously spent at least a month performing regression tests, then now these tests will take no more than two weeks.

Advantages of QA outsourcing
- Expenses cut by 30%-50%
- Testing time cut by 50%
- Increased level of test automation
- IT department specialists no longer used for non-core work

QA outsourcing is provided by independent companies that specialize in testing software. They possess a broad range of skills as well as an understanding of industry-specific requirements and their customers' business. As a rule, they offer customers the ability to use remote testing centers to minimize the cost of the service.

Transitioning to QA outsourcing begins with an assessment. Test experts determine how much the organization's costs could be cut. These calculations are verified during a pilot project and become the basis for determining the price. In parallel, the customer's IT specialists are brought into the joint development of an ITSM (IT service management) model, since not all tasks and responsibilities can be transferred to the service provider. Certain managerial functions must remain with the organization. Methods to monitor the service provider, reporting formats, KPIs, and monitoring tools need to be worked out.

Prerequisites and advantages

Companies never see the complete picture when it comes to expenses on testing and quality assurance

With the IT infrastructure's increased complexity due to the number of integrated IT systems there comes a natural increase in the need for software testing. The quantity and complexity of tests is growing, and this in turn significantly delays product releases.

However, nearly all organizations are trying to reduce the time to market for software products, so they have a negative perception of the longer software life cycle that results from the growing volume of testing. Sometimes this turns into partial or even complete abandonment of testing and leads to a noticeable drop in the quality of IT services.

This problem is compounded by the pressure business puts on IT departments to lower costs on development and maintenance of information technologies. Ultimately, the IT director ends up at an impasse, being expect to lower expenses while simultaneously increasing the quality of IT services amid runaway growth in the required volume of testing.

This is why external QA service providers offer organizations a solution to this dilemma. Consultants should above all identify the optimal way to improve the ratio of cost to test quality. A thorough analysis of existing procedures makes it possible to calculate a realistic estimate of the potential savings that could result from switching to QA outsourcing. Consultants should perform a detailed examination of the customer's pain points.

It should be noted that it is not a solution for an external service provider to simply provide its own resources to perform the growing volume of tests. When it comes to quality assurance the quantity of tests is not necessarily proportional to the quality of the software product being tested. Testing is not an end in itself.
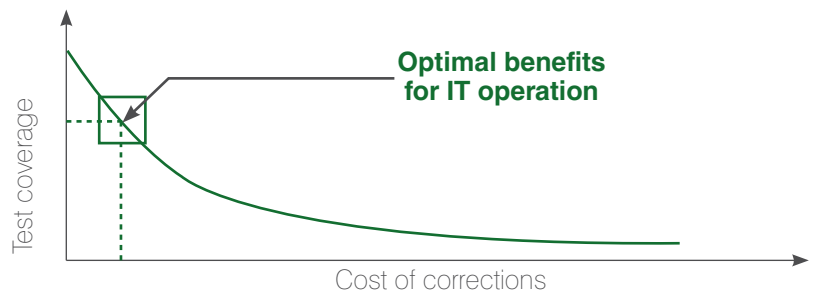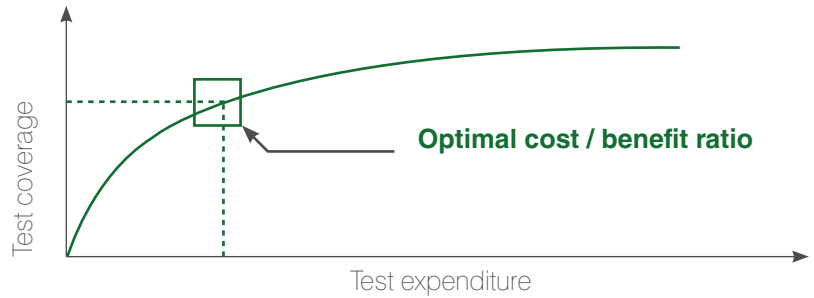
Risk factors

The main risks to organizations that do not employ QA outsourcing include increased direct costs on testing, lower software quality, reduced loyalty of employees involved in performing non-core testing work, and a rise in indirect quality assurance costs due to software defects emerging in the production environment.

Companies never see the complete picture when it comes to expenses on testing and quality assurance. For example, if a lack of testing causes a bug to sneak into the production environment and disrupt the work of end users, the cost to the organization will be far greater than what the cost of testing would have been. An estimate of a company's costs made before QA outsourcing is introduced should consider the complete picture (just as when calculating TCO) and include indirect costs related to fixing defects discovered in the later stages of the life cycle.

In the worst case, refusing QA outsourcing could lead to failures and outages in business processes

Testing substantially reduces indirect costs

OPTIMAL TEST COVERAGE

Test coverage

Optimal cost / benefit ratio

Test expenditure

Test coverage

Optimal benefits for IT operation

Cost of corrections

NON-OPTIMUM TEST COVERAGE
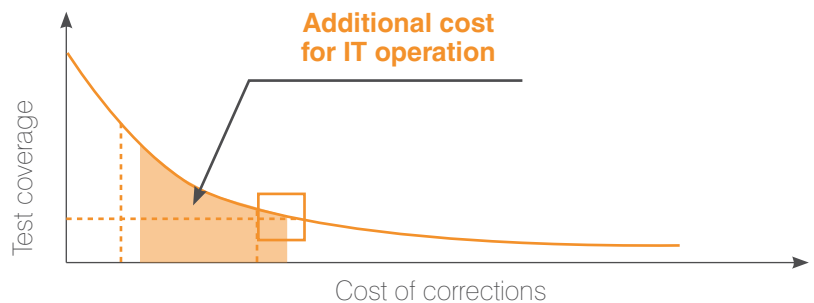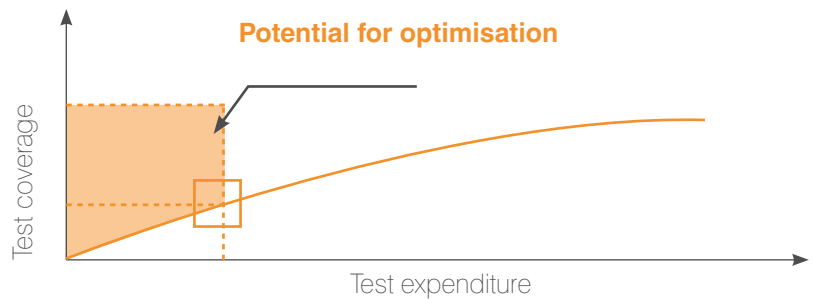
Test coverage

Potential for optimisation

Test expenditure

Test coverage

Additional cost for IT operation

Cost of corrections

In the worst case, refusing QA outsourcing could lead to failures and outages in business processes. There are well-known instances organizations' operations have been paralyzed because IT support specialists were unable on their own to fix a problem caused by software bugs.

Long-term contracts, typical for QA outsourcing, let the service provider more effectively plan and manage the team's load

Outsourcing QA to Performance Lab

Performance Lab is an experienced and professional testing services provider that reliably protects customers from the negative scenarios described in the previous section. Not only does Performance Lab have methodological and technological expertise in software products, it also understands its customers' business and consequently knows exactly what needs to be tested and why. This service provides more advantages, because it lets customers improve their own processes. QA outsourcing is usually based on long contracts of 3-5 years and contributes to a long-term increase in effectiveness.

To guarantee that they have methodological and technological expertise, service providers should comply with international standards. The de facto standard in the field of software testing is ISTQB (International Software Testing Qualifications Board) certification. Performance Lab's ISTQB certifications are recognized around the world. Unlike IT integrators that offer software testing as an additional service, Performance Lab is focused on software testing, which is its main business.

Another advantage of Performance Lab is the availability of remote resources. This lets customers achieve additional savings.
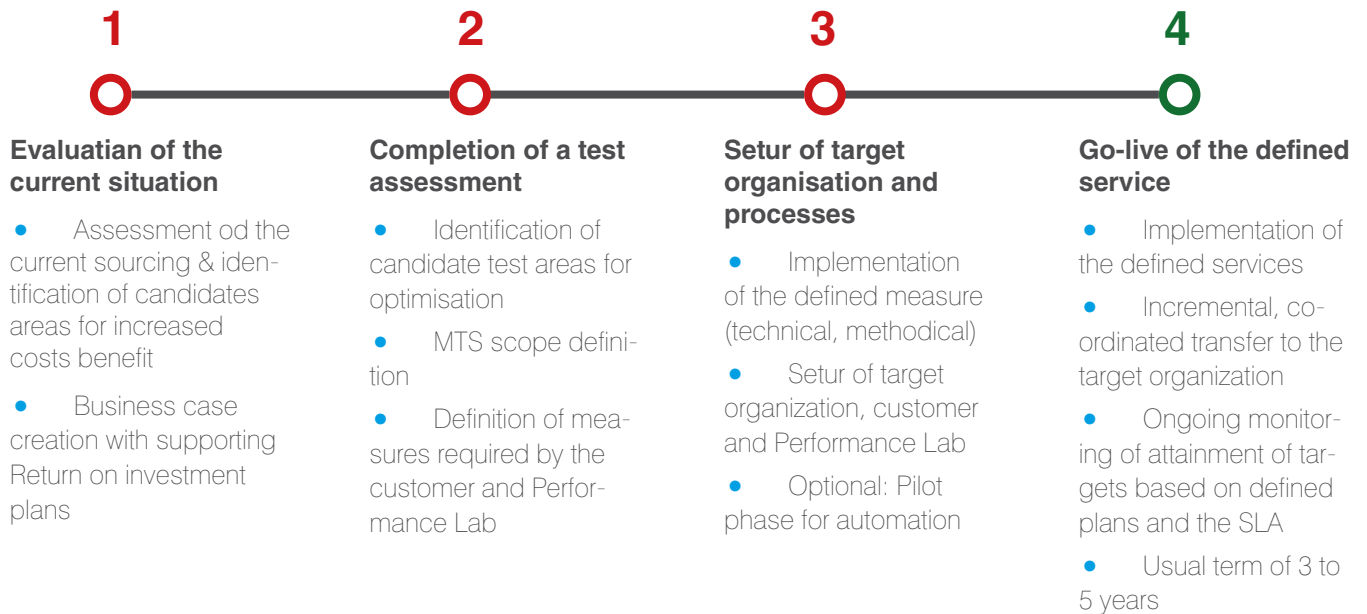
Success factors

After transitioning to QA outsourcing, organizations realize savings of at least 30%. Savings may reach 50% if remote testing centers are used. Besides the use of remote centers, testing costs are lowered thanks to the application of proven industry solutions, standards, and an increased amount of test automation. The time required to run tests can usually be cut by 30%-50%. At one major bank Performance Lab specialists managed to cut testing time from two days to two hours.

Long-term contracts, typical for QA outsourcing, let the service provider more effectively plan and manage the team's load. Using the same remote testing centers to serve different customers makes it possible to better utilize test specialists and avoid downtime. This is beneficial to all involved, since the basic testing tasks are identical, especially those that pertain to the same industry, such as banking or insurance.

Companies gain the ability to raise the effectiveness of internal business processes by transferring the work to an external service provider. In order to guarantee that all of the testing duties are performed, the responsibilities of each party need to be described in great detail. Additionally, what materials are to be provided by the customer to the service provider, when, and by whom should also be specified.

Standard approach to introducing QA outsourcing

1   **2**   **3**   **4**

Evaluatian of the current situation

- Assessment od the current sourcing & iden-tification of candidates areas for increased costs benefit

- Business case creation with supporting Return on investment plans

Completion of a test assessment

- Identification of candidate test areas for optimisation

- MTS scope defini-tion

- Definition of mea-sures required by the customer and Perfor-mance Lab

Setur of target organisation and processes

- Implementation of the defined measure (technical, methodical)

- Setur of target organization, customer and Performance Lab

- Optional: Pilot phase for automation

Go-live of the defined service

- Implementation of the defined services

- Incremental, co-ordinated transfer to the target organization

- Ongoing monitor-ing of attainment of tar-gets based on defined plans and the SLA

- Usual term of 3 to 5 years

Switching to QA outsourcing lets companies optimize a host of parameters: expenses, amount of testing, organizational structure, and employee utilization. The service makes it possible for the customer's specialists who have been drawn into testing to return to performing their core duties.

Using remote testing centers

The ability to use remote testing centers depends on many factors, such as the amount of testing, the complexity of the software to be tested, requirements imposed by the security department, and the frequency and type of interactions between the customer and the service provider. All of these factors should be thoroughly examined. The greatest difficulty when involv-ing remote centers is usually their availability of the required level of domain knowledge and experience testing specific software products. Therefore, to avoid such problems, it is desirable to use the optimal balance of local and remote re-sources.

Performance Lab offers customers several of its own remote testing centers, employing a total of more than 100 specialists, in various Russian cities.

Distinctive features of the service

To supervise the achievement of the desired results, Key milestones and quality criteria must be determined in advance for each stage of the transition to outsourcing

MANAGEMENT AND CONTROL

The model for managing outsourcing should give the customer transparency and oversight of the work being performed. Persons responsible for oversight and monitoring of the testing work must be identified, and the format and frequency of reports should also be specified. Such questions are best settled when transferring testing to the service provider, during the "Introducing the target process" stage.

Key milestones and quality criteria

To supervise the achievement of the desired results, Key milestones and quality criteria must be determined in advance for each stage of the transition to outsourcing. The quality criteria must absolutely be agreed upon and described in the process documentation before testing work is transferred to the external service provider.

Monitoring

Nearly all modern test management systems include monitoring tools that the customer can use to supervise the service provider's work. The monitoring system should display the current values of the agreed upon KPIs (key performance indicators).

Moreover, the service provider should inform the customer about the status of the work in regular reports sent via email.

Effective verification methods should include regular talks between the customer's specialists and the service provider. Employees involved in operations may meet weekly or even daily. The project committee may plan to meet once every two weeks. The organization's top management should be informed of the project's status at least once per quarter.

Level of service

An important point when concluding a contract is a service level agreement (SLA). Such an agreement is necessary in order to minimize the risk that defects will surface during all of the stages of the software life cycle following testing, including in commercial use. There are several ways for the customer to verify that the SLA is being fulfilled, for example, analysis of the number of bugs missed based on feedback from users or operations department employees. If a company performs its own quality control after the external testing (e.g. during integration testing), then the SLA may be priced based on the results of these tests. SLAs should also be concluded which define requirements on testing time frames and the service provider's time to respond to customer requests.

The service provider should also be sure that the SLA will allow it to reliably fulfill its obligations to the customer. For example, SLAs must precisely describe exactly when a system will be available for testing.

Paying for results

Paying for results is most transparent arrangement for the customer. If enabling the service involved setting up monitoring of the service provider's work, then the customer can promptly supervise the results and the costs associated with them.

In practice, this might look like paying for a test case or for running a test case. If the customer decides that fewer tests are sufficient for a particular release, then the customer will pay less. Besides paying for results, it is also possible to pay per line of code analyzed by the service provider as part of work for early detection of defects (EED). This model can serve as a con-

If the customer decides that fewer tests are sufficient for a particular release, then the customer will pay less

venient alternative to a fixed-price model, since it includes options that let customers save.

SCOPE

Types of testing

QA outsourcing is most suitable for organizations that perform regular test cycles, running a fixed set of tests scenarios (**regression testing**) for specific IT systems requiring constant quality control in the face of changes due to new releases or updates.

QA outsourcing can also be applied at the next phase, **integration testing**, the purpose of which is to verify that the environment is operational after the altered IT system is integrated with it.

QA outsourcing can also be applied in software development projects but only in cases when there are clearly defined technical requirements and the volume of testing is understood.

Industries

Active users of QA outsourcing are major banks, insurance companies, telecommunications companies, retailers, and government organizations. There is some demand for such services in certain sectors of industry, such as manufacturing.

QA outsourcing also find application in the small and medium business segment. For example, banks and insurance companies in this segment, as well as major banks, are governed by changes in law. Thus, their IT systems change and also require testing.

PERFORMING TESTS

Creating testing requirements requires pushing away from a detailed test coverage model. It does not make much sense to create

isolated test cases. Accordingly, customers' IT department employees and managers should be involved in the work to define the requirements. The use of standards, such as ISTQB guidelines, is recommended to improve the effectiveness of the requirements specification. If necessary, a company that provides testing services should conduct brief training on these standards for the customer's specialists.

At organizations that have an in-house test department, the service provider should involve three groups in the creation of testing requirements: testers, IT department specialists, and managers. Besides its own tools and methodologies, a service provider should consider the customer's practical experience.

Involving all of the necessary parties in the preparation of testing requirements is a very important factor of success. Accordingly, the rules for interaction among the parties, including a description of roles and areas of responsibility, must be clearly specified in the contract.

Test coverage and depth

Test coverage and depth should be determined and agreed upon in advance. This requires building a criticality-complexity matrix. This matrix classifies the software product's features in terms of testing complexity and how critical they are to the business. A1 is the highest criticality-complexity rank, while C3 is the lowest.

This rank is used to determine the optimal test coverage of the features by test cases. The goal is to achieve the most coverage with the lowest costs. The criticality-complexity matrix also helps customers solve the problem of lowering testing costs with minimal negative consequences for software quality.

Test coverage and depth should be determined and agreed upon in advance. This requires building a criticality-complexity matrix

A3	A2	A1
B3	B2	B1
C3	C2	C1

Criticality ↑
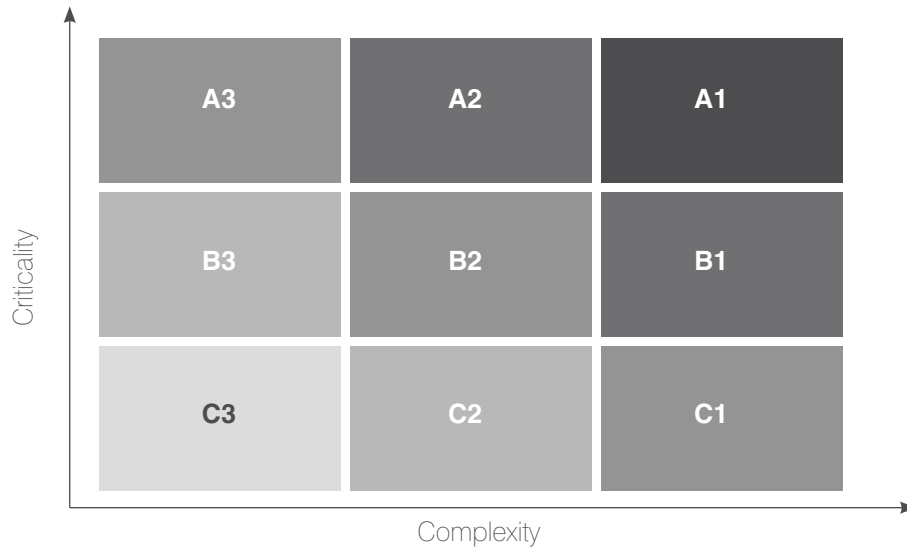
Complexity →

- The **CMM** allocates test procedures to test objects in a manner commensurate with risk

- The second dimension (complexity) dictates the expence required to perform the test procedure in question

- The test procedures determines factors such as depth of testing in the test case design

- Provenen in practice

The result: Test object lists with the expenditure required for upcoming test activites

Requirements for the service provider

The service provider should be a testing professional and have a mastery of all the necessary methodologies, such as the criticality-complexity matrix. Moreover, the service provider must have expertise in areas such as:

1. Providing the full spectrum of testing services
2. Documenting test cases and test requirements
3. Test automation tools and techniques
4. Test management
5. Reporting test results

In addition to technical compliance, a service provider should ensure that the team of specialists does not change during the duration of the project. Specialists should undergo regular training to stay abreast of new developments. The customer should also take note as to whether the service provider's specialists have any test certifications.

TEST AUTOMATION

If a software product is sufficiently stable and has features that do not change or rarely change, then it can be tested using automated tests. This is possible after a detailed determination of the scope and depth of the tests. Then the appropriate test automation tools

are identified. It must be noted here that choosing the right tool is one of the deciding factors for the success of test automation projects. Once a tool has been selected and automated tests have been developed, these tests must be demonstrated to the customer so the customer can agree that they are running correctly and learn how to interpret the automated test results provided in the reports. As a rule, a QA service provider is responsible for overall testing and the customer's role in the process is limited to accepting the test results. However, in certain situations it may be acceptable to transfer the automated tests to specialists from the customer's test department or IT department, along with the responsibility for running and maintaining them.

CONDUCTING TESTING

From a testing perspective, it doesn't matter if the IT system is an off-the-shelf solution, such as SAP, or a customer's own in-house development. In both cases, standard test procedures that can determine whether the software is functioning properly are performed. A service provider's domain knowledge is more important than the system's technical particulars. Unlike standard software products, in-house developments usually require more intense testing.
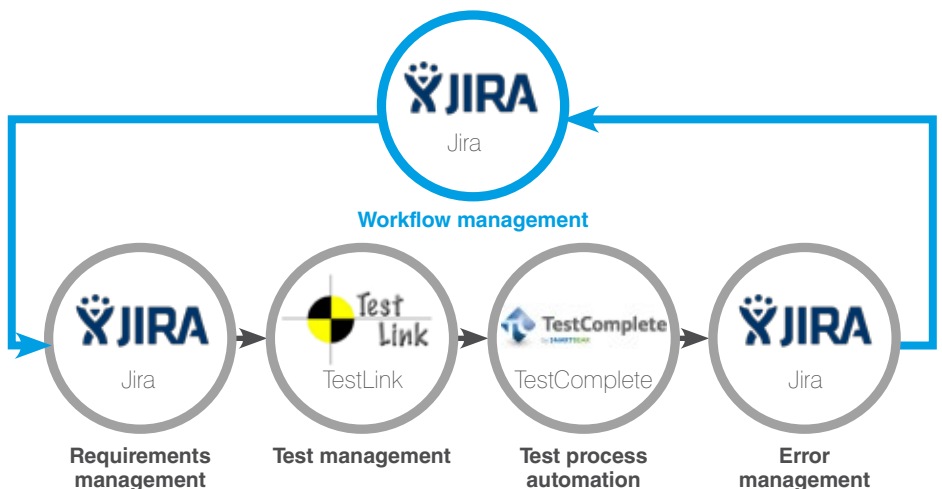
![Performance Lab - Software testing company]

| Preparatory stage | Repeated iterations | |
	Running tests	Updating the test model
• Initialization and planning of testing • Analysis and documentation of test cases • Creation of testing instructions • Description of requirements for test data	• Allocation of tests among testers • Receipt or generation of test data • Manual tests • Documentation of test results, logging of bugs, additional tests • Monitoring and tracking of progress. Participation in meetings to report status.	• Work on errors and optimization of the process together with the customer • Modification of existing test cases and instructions
Test Automation	Conducting automated tests	Increasing level of test automation

The service provider works in a test environment provided by the customer, either located on-site at the customer's facilities or remotely using a remote access tool (e.g. a Citrix terminal server). Test environments can also be deployed at the service provider's facilities. Customers usually prefer to use their own test environments, since doing so makes the service provider's work more transparent.

Test documentation

To document the results, the service provider's specialists should use special tools to record every step and action performed during the testing process. The documentation should preferably include information about the previous iterations of testing and be included in a revision control system.

Tools used by the test team (example)

Jira

Workflow management

Jira — **Requirements management**

TestLink — **Test management**

TestComplete — **Test process automation**

Jira — **Error management**

Testing centers offered by external service providers should comply with international security standards such as ISO/EC 27001

INFORMATION SECURITY

Roughly the same information security requirements that apply to data centers also apply to remote testing centers. They include data encryption, backups, crash recovery, a specified level of uptime for business processes, employees' access to IT resources, and employees' physical access to the testing center facility.

Testing centers offered by external service providers should comply with international security standards such as ISO/EC 27001. This certification puts requirements on the information security management system to demonstrate the organization's ability to protect its information resources. A service provider who possesses such certification has deployed an information security process, protected access to data and infrastructure, and set up monitoring. The certification also means that the organization's personnel have been trained and possess the skills necessary to comply with information security requirements.

Security requirements at a number of organizations, especially banks, do not allow employees of external organizations to be granted access to data stored on their IT systems. An external QA service provider should know how to conduct manual and automated testing with synthesized and anonymized data, without access to actual customer data. The service provider should also know how to operate on anonymized data using in-house or commercial solutions.

HUMAN RESOURCES MANAGEMENT

In terms of managing people, when switching to QA outsourcing, nothing changes for the customer. The managers who were responsible for testing continue to be responsible for it. Now they simply expect the tests to be performed by the external service provider rather than the in-house IT department.

After QA outsourcing is implemented, the load on the customer's employees becomes significantly smaller. This lets them perform their main work instead of testing, which notably improves employee efficiency.

To make the teamwork more effective, it is recommend that basic ISTQB Foundation Level training be conducted for the customer's specialists. This will help team members from both parties better understand one another.

Conclusion

QA outsourcing makes it possible to address growing testing needs and is an effective and economically justified alternative to in-house testing

QA outsourcing makes it possible to raise the quality of software products while simultaneously lowering costs. IT managers freed from testing can return to their core duties and focus on achieving business results. Thanks to the fact that QA outsourcing is paid for in proportion to the results obtained, costs become much more transparent and manageable.

Organizations' growing demand for new IT products is leading to increasingly complex IT infrastructure consisting of a huge number of integrated components. If making changes to separate IT systems did not previously have a big impact on business processes, then now, when systems are integrated in a complex infrastructure, changing an individual system affects a large number of other systems and may create risks for critical processes.

The large number of connections in a complex infrastructure inevitably leads to the need for more intense testing. Unfortunately, many organizations only realize this after problems arise in their operations. The scope and complexity of testing are growing. Testing is becoming work that must be performed regularly and begin in early stages of the application life cycle in order to manage to be ready to deploy new releases and updates.

This situation is creating opportunities for companies that provide professional software testing and QA services. QA outsourcing makes it possible to address growing testing needs and is an effective and economically justified alternative to in-house testing. The use of industry standards and state-of-the-art automation technologies lets customers cut testing time in half, and using remote testing centers can help reduce expenses by 50%.

Checklist for managers

☐ **Management**
Allocate roles and areas of responsibility between the customer and the service provider. Prepare a service level agreement (SLA).

☐ **Monitoring**
Introduce key performance indicators (KPIs) and specify the format for regular reporting.

☐ **Requirements management**
Determine the scope and depth of testing, the methodology, and the tools.

☐ **Transfer responsibility for testing to the external testing provider**
Determine the conditions necessary to transfer responsibility for testing and record them in formal documents.

☐ **Test Automation**
Automate manual tests and prepare detailed documentation that includes instructions for the customer on how to interpret the results of automated tests. Coordinate all automated tests with the customer.

☐ **Test documentation**
Be sure that the test documentation is complete and understandable, and that version control is set up to allow changes in the documentation to be tracked..

☐ **Tools and methodology**
Use a comprehensive approach that allows full use of the capabilities of tools and processes.

☐ **Personnel**
Involve specialists from the IT and business departments in planning the transition to QA outsourcing.

☐ **Employee qualifications**
Measure qualifications using international standards such as ISTQB.