



Adding value to your business



QA & Testing Services

Introduction

In today's extremely competitive and changing business environment it is critical to offer a brand new, exclusive, and functional service to the market in order to keep or even expand the market share. To be ahead of competitors, a new application should be deployed as soon as possible to get the return of investment and win in a competitive race. On the other hand, a solution should be reliable, correspond to the business needs, has low response time, be flexible by scaling up and scaling down, work with variety of configurations, and be ready for possible high load.

When a company orders a solution development to an external provider, it's vital to ensure that the quality of the developed system corresponds to the initial requirements, and is reliable by the acceptance testing.

For appropriate performing of acceptance testing, the following actions should be completed: reproduction of real working environment, real system workload and possible high load; analysis of business area to identify most of possible system usage scenarios (test cases); running all test cases; identifying test coverage; checking different use cases chains, etc. All that quality assurance and testing activities require qualified QA specialists

onboard, investments in establishing QA infrastructures and QA processes, time for problem area analysis, test automation specialists, system administrators and many other factors depending on the particular case.

To resolve that task, a company usually outsources QA & Testing processes to the third-party provider, qualified enough to deal with the required complexity, and able to perform all necessary test procedures within the limited time-frame.

This white paper explores QA & Testing services provided by Arkuda Solutions.

In "**Business challenges**" section we list main actions that should be done for successful testing implementation.

In "**Our QA & Test services**" section we describe full range of Arkuda's services in QA & Testing area.

In "**Organization approach**" section we describe our main principles of test activities organization and implementation.

In "**Business values**" section we review advantages of Arkuda Solutions' services for partners from business point of view.

Business Challenge

Before the final decision about how to perform QA and testing is made, it is important to take into consideration the following aspects listed below.

Test Engineers

To be able to plan, organize, build infrastructure, run tests, gather and measure results, company should have appropriate highly qualified specialists. It requires additional investments in team hiring, training, and releasing.

Possible gaps between testing sessions

In case of long intervals between delivery/releases, for example each 3-6 months, there are gaps between test sessions when workload of onshore test team is low. This situation has an influence on cost efficiency.

Test design

Before the start of the actual testing the business area should be analyzed from the points of view of end user, system engineer, system administrator. After that, it

becomes possible to create requirements to test infrastructures, test cases, test scenarios, test plan, input combinations, etc. This kind of activities requires experienced specialists with high qualification.

Test environment organization

For sufficient system testing the real working environment should be emulated. Depending on each particular business case, it may include network topology, servers, work-places, predicted number of end-users connections, different versions of operational systems and software installed, and different hardware platforms.

Time for testing

In many cases, the results of QA & testing should be gained as quickly as possible; sometimes it means that there is not enough time for the necessary testing scope, for example, to build acceptance test of new functionality and regression test for entire system after daily build.

Our QA & Testing Services

Test planning and Design

To achieve the desirable result, test scope should be identified and all activities should be planned. As a result of feasibility study, the set of artifacts will be obtained. The scope of artifacts depends on the particular project and could include Test Plan, set of Use Cases, set of Specifications, Test Data sets, Test Scenarios.

Embedded and Real-Time Systems testing

End-to-end testing for embedded software and hardware across gadgets/devices, Real Time Operating System, development platforms.

Functional testing / Black box testing

Testing of the system from the end-user point of view. The main goal is to check functionality of software according to the initial requirements. Performed both manually and automatically on the basis of the Test Plan, Test Cases, and Scenarios.

White box testing

Testing with access to internal data structures and algorithms including the source code of the system. This approach provides immense possibility to identify errors and the source of the errors, and requires higher qualification from the Test Engineer comparing to Black Box testing. Evaluates the test coverage of the system using various metrics.

Regression testing

When some part of software has been changed or implemented, there is a possibility that it would collide with previously developed parts. Due to this, all the possible collisions should be checked.

Integration testing

As a rule, the system consists of many modules. In rare situations, modules integrated into one system create collisions and errors, even if they worked fine in stand-alone mode. Therefore, this integration should be tested before actual system use.

Performance testing

Aims at evaluating the system performance. This testing is performed on close-to-real usage configuration, by automatically emulating real-life activities. The result is a set of measurements, such as business transactions per minute, number of simultaneous connections, GBs per second, response time, etc.

Stability testing

Evaluates reliability of the system. Usually the usage of the system is automatically simulated for a long period according to Test Cases and Test Scenarios.

Usability testing

Identifies the convenience of the system usage by the end users. Evaluates the system's usability against requirements, common standards, and regulations.

Stress and Load testing

Allows to check the system behavior under high load. It also helps to find the bottlenecks in the system's performance.

Unit Testing

Testing conducted to verify the implementation of the design for a software element (e.g. unit, module) or a collection of software elements. The purpose is to ensure that the program logic is complete and correct and that the component works as designed.

Compatibility testing

Before use of newly developed or changed system with other systems, compatibility should be checked with different operational systems, installed applications, etc.

Migration Testing

Testing to ensure that all data elements and historical data are correctly converted from an old system format to the new system format.

Acceptance Testing

Testing conducted to determine whether the system satisfies the acceptance criteria, and to enable the customer to determine whether to accept the system. Acceptance testing ensures that the customer's requirements and objectives are met and that all components are correctly included in the customer package.

Recovery Testing

Testing done to ensure that application restart, backup and recovery facilities operate as designed.

Reports preparation

After completing all QA & test activities, it is very important to summarize all the results gained in the form of test reports, recommendations, and statistical data. Some of these artifacts are created automatically, for example, by the Bug Tracking System, some are generated manually. These documents are the basis for future decision making and further reference, such as "Does the system correspond to the initial specification?" or "Is the system reliable enough for every day usage?" etc.

Organization Approach

Test automation

We use automation testing to maximize the test coverage of the testing system. For test automation we use different tools available from the third party providers as well as develop custom solutions for each particular case. Arkuda has its own in-house implemented cross-platform extendable Test Automation Frameworks.

Metrics for measuring

We can use a wide range of metrics to get tangible results in QA & Testing activities. The scope of metrics varies from project to project and from one problem area to another. Metrics helps to draw a picture of the real product status, actual progress, and to answer business-related questions. It is very helpful, especially when the system does not possess a user interface, such as embedded systems.

The QA/Test team has defined specific metrics used within the testing process to evaluate bug statistics and testing effectiveness and to track our performance.

We use metrics to report to our partners on a regular basis.

The most common tracked measurements are listed below:

- Number of test cases run
- Test cases passed/failed distribution for each build
- Number of defects identified per person
- Defect detection time
- Numbers of rejected (invalid) defects
- Numbers of reopened defects
- Defects distribution by status, severity, type, location etc.
- Defects fixed as % of total defects found
- Numbers of test cases per person
- Test coverage
- Bug fix rate
- Test effort performance

Range of Tools

For performing Quality Assurance and Testing Arkuda's team use wide range of tools for process organization, test automation, status reporting, configuration management, bug tracking, etc.

Particular set of tools depends on the project, partner's demands, and business area.

We use the following most common QA & Testing tools:

- Segue SilkTest
- Mercury QuickTest Professional
- Mercury WinRunner
- Mercury LoadRunner
- Automated QA Test Complete
- Jakarta jMeter
- Quick Test Professional
- Rational Application Performance Analyzer
- Rational AppScan
- Rational Functional Tester Plus
- Rational Performance Tester
- Rational PurifyPlus
- Rational Quality Manager
- Rational Robot
- Rational Test Real Time
- Rational Test Manager
- Selenium IDE
- JIRA
- Rational Service Tester for SOA Quality
- Rational ClearQuest and Functional Testing

Business Values

Let's have a look at main advantages of using Arkuda's QA & Testing services for independent testing.

Integrity

Arkuda Solutions creates seamless workflow integration with our partners; as a result you don't need to make any significant changes in the existing processes. It allows us to exchange knowledge and expertise in a natural way, without additional efforts, and to act as a part of our partner's team.

Time to market

There is no necessity to spent time hiring, building, and finally releasing your own QA team. Arkuda provides experienced team ready to start as soon as needed.

Flexibility

We can increase or decrease team size according to your business needs. You do not have to spend resources on headcount changes.

Costs saving

You don't have to pay a full salary to specialists not requiring full-time utilization. You cover only time spent on the project.

Lower Risks

We provide the predictable result within the agreed plan and budget which fits your business plans.

Transparency

We provide a complete picture of the project status. All activities are tracked on the daily basis. You will be able to see the real progress and have a possibility to check it against planned.

Contact Information

Telephone [+1.415.692.5417](tel:+14156925417)

Skype: arkuda.solutions

Sales sales@arkudasolutions.com

General info@arkudasolutions.com

RFP rfp@arkudasolutions.com

Location:

Antonova Aviakonstruktora st.,15-A, of. 52

Kyiv 03186, Ukraine

If you are interested in our services or any product by Arkuda Solutions, please contact us for further queries.