

HOW WE DELIVER

Celfocus Test Automation: Bringing Automation to Quality Assurance

Key Takeaways

Understanding the new challenges Quality Assurance faces in the Digital Age.

Learning more about the role of automated testing in ensuring Quality Assurance process consistency and efficiency.

Understanding Celfocus's approach to Test Automation.

All Eyes on Quality: A Paradigm Shift

In the quest to deliver quicker and better solutions to tackle customers' increasing needs and requirements, organisations are aligning their software development and Quality Assurance practices to achieve high-quality products that can be delivered in shorter cycle times.

Developing reliable products and solutions is any company's top priority. More than ever, having **a robust and effective Quality Assurance process is critical** to systematically assess software quality and detect defects in the development lifecycle. Only this way it is possible to sustain trust across the entire stakeholder ecosystem. In fact, in a digitally-led world, successful companies are those that bear high levels of quality when quickly turning an idea into a product or service, while also improving work processes and guaranteeing efficiency to better compete in an increasingly crowded market.

As part of a Quality Assurance process, testing is a crucial stage in a software development lifecycle to ensure that a good, accurate and reliable software is created. Beyond detecting and correcting defects, **testing helps organisations understand the actual versus the expected outcome on a given solution, so that they can improve the quality of their products**, either from a functional or non-functional perspective, to meet business and user goals.

Automation for the Win

As the adoption of Agile and DevOps practices increases, so does companies' willingness to embrace automation in software testing. It assures a continuous incremental pace for software creation and development, improves solutions' time-to-market advantage and increases efficiency. Agile methodologies promote continuous iteration of development and testing throughout the

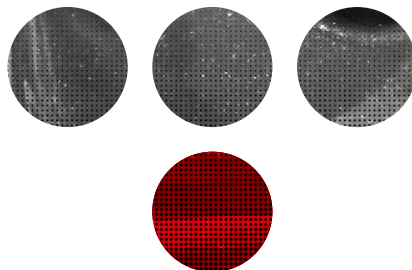
software development lifecycle, reducing the suitability of manual activities in keeping up with the pace of digital transformation. Moreover, synchronising development and operations, DevOps promises faster development and deployment of more reliable software because testing is embedded into each development cycle.

Besides leading to faster software releases, automated testing achieves continuous testing, optimised testing cycles and increased efficiency in the Quality Assurance process. **These quicker rollouts enable businesses to optimise their budget**, allowing to increase test coverage and accomplish continuous integration and delivery - all while being able to create and try out new features.

Celfocus has a dedicated Quality Assurance team that possesses skills and experience in supporting projects of different types and sizes, and in engaging with many different customers, cultures and quality approaches that require adapting a diverse and rich set of tools and practices.

“Making Celfocus and its customers’ brands renown by their software excellence” is the team’s mission statement.

Before introducing Celfocus’s approach to Test Automation, we’ll go through Celfocus delivery approach to understand how the company frames Quality Assurance and testing, according to different delivery methodologies.



Celfocus Delivery Framework

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Celfocus Project Management methodology uses a proprietary “Delivery Framework” and was designed to respond to the most demanding and fast-paced projects. This framework consists of a set of **processes, assets, and reusable components** laid out to respond to project failure risk and accelerate developments, allowing

Celfocus to address very dynamic and demanding businesses with very high success rates. The framework is ISO9001:2008 certified and comprises the Celfocus Project Management methodology, the Solution Framework, and Celfocus Agility Flow.

To determine the most suitable delivery methodology for each context beforehand, Celfocus focuses on understanding the nature of the customer and the challenge to tackle.



Waterfall

When definition, not speed, is key to success.



Agile

When focus on delivering business value on a constant pace is more important.



DevOps

When E2E cooperation and efficiency are a must.

Solution Framework

The Solution Framework is Celfocus's certified methodology for delivering Waterfall projects and professional services. Celfocus has defined and uses a set of methods, techniques and tools in each Quality Assurance team intervention. The testing methodology is based on the ISO/IEC/IEEE 29119 standard.

The testing team's tasks are themselves a sub-project and include planning, designing, documenting, executing and revising the flow shown above. Starting with the setup of the test automation infrastructure, integrated with CI/CD and test management tooling, automation candidates are established according to delivery and test strategies.



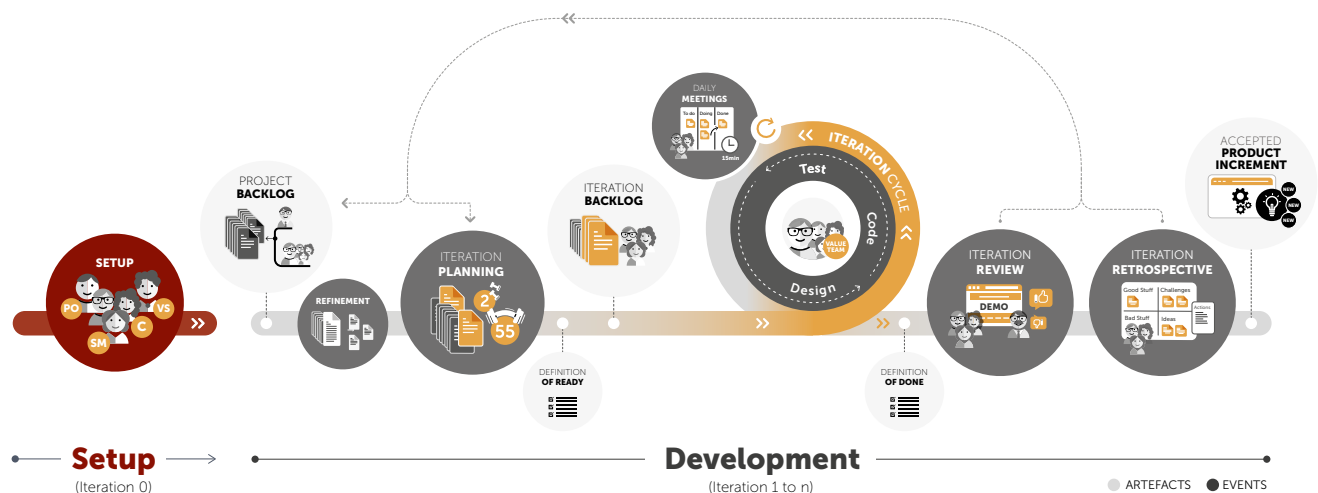
After a feasibility analysis, based on a cost-benefit assessment, to decide which tests will be automated, those test cases are detailed from an automation perspective, and their scripts are developed within

Celfocus Automated Testing Framework. Finally, automated test cases are deployed to the development pipeline to be triggered automatically, on-demand or according to a schedule.

Celfocus Agility Flow

Celfocus Agility Flow is Celfocus's certified methodology for delivering Agile products, projects, and services. It maximises business value by empowering teams with

greater flexibility on requirement introduction and prioritisation while providing quick and incremental system functionalities.



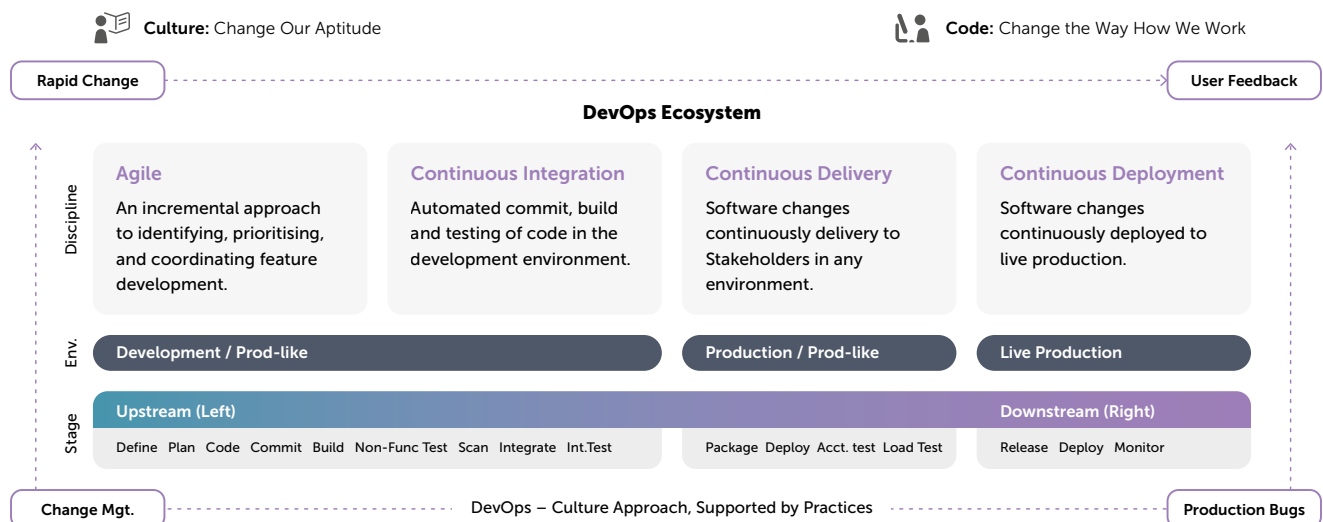
In an Agile project, the whole team gets involved and is closer to the quality process. In addition to the quality assurance responsibility all roles have, Quality Assurance team members promote collaborative ownership of the quality and testing aspects.

The specific Quality Assurance tasks mentioned above for Waterfall projects are fitted within the Agile delivery model, being the Setup performed on iteration 0 and the remaining activities on each sprint iteration throughout Development.

DevOps Delivery Approach

The DevOps approach seeks to combine application development and deployment into a more streamlined process, shifting some of the operation team's

responsibilities back to the development team to facilitate continuous development, integration, delivery and monitoring processes.



Being DevOps-enabled, Celfocus Automated Testing Framework is ready to deal with Agile and DevOps delivery methodologies, providing seamless CI/CD

integration and being able to setup and deliver the most relevant automated test cases in due time.

About Celfocus Test Automation

As quality becomes more and more critical to delivering high-quality software, test automation gains more relevance, stemming from the evolution of software and applications' technical and functional requirements and

businesses' ever-increasing dependency on technology. As a result, quality engineers and project teams are better equipped to mitigate quality issues more effectively.

As an independent team, Celfocus Quality Assurance engineers ensure that the delivered software fulfils its requirements and also provide delivery teams with accurate and useful quality-related risk management information on time.

Celfocus's knowledge and experience in testing, combined with great flexibility to adapt to different quality approaches by accommodating a set of practices and tools, puts the company in a unique position to bring automation to Quality Assurance processes.

Higher Frequency of Testing Execution

Tests are developed once and may be used as many times as required during project development and delivery.

Wider Testing Coverage

Performing tests in multiple browsers, devices and versions to prevent defects to reach Client's acceptance phases and production.

Reduced Execution Duration

Tests consume most of the effort in daily Quality Assurance activities.

Celfocus Test Automation Framework is cornerstone in bringing test automation to live and was developed to cope with common hurdles and to allow automation widespread adoption within our delivery projects.

Celfocus Automated Testing Framework

Celfocus Automated Testing Framework is a technology-agnostic framework suitable for complete and complex testing systems. It applies industry best practices and standards, enabling teams to design and implement rapid, **robust, scalable and easily configurable scenarios** for multiple testing environments, with low maintenance effort.

Test suites can be triggered to run automatically with every release, promoting continuous testing under continuous integration/continuous development (CI/CD) contexts, or on request to be executed at desired times and frequencies.

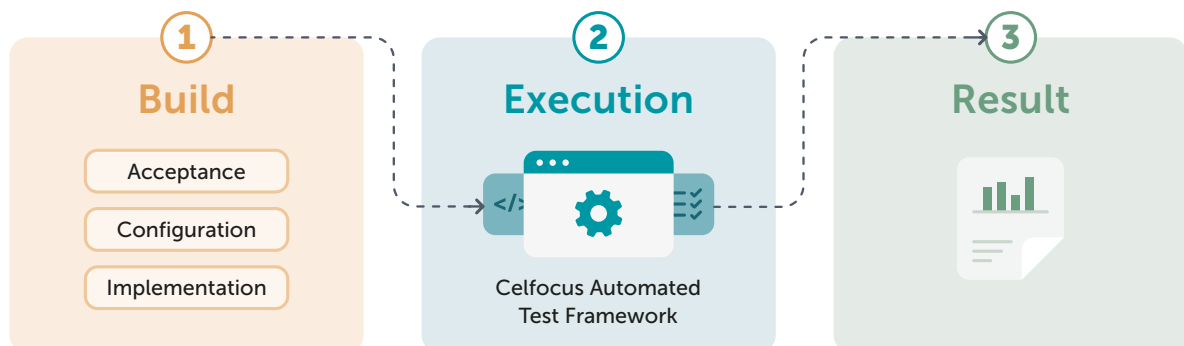
The framework abstracts the underlying technologies to support automated testing development. It allows to run tests against web, mobile native apps, database, services and open APIs, as well as performance tests, among others. It can be used to validate the applications

at different stages and over multiple iterations, mitigating the risk of human error and guaranteeing an efficient development lifecycle with all necessary checks.

Integrated into Celfocus Automated Testing Framework is a **codeless test automation tool**, which allows teams that do not have programming or in-depth technical knowledge to perform test automation effectively. The impact is significant as it enables scaling tests to run more often and include more systems while ensuring high levels of quality and confidence.

From Development to Results – How Celfocus Automated Testing Framework Works

Celfocus Automated Testing Framework decouples test design from execution, allowing the test to be implemented after its design, though only executed when required.



In the **Build** stage, tests are developed following three steps: **acceptance**, which involves a functional description of the test and some structural rules; **configuration**, through which test data is provided (e.g. web pages URLs, database addresses, services endpoints); and **implementation**, which defines the steps that have to be executed to meet the acceptance criteria.

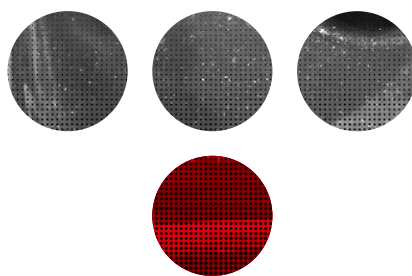
In the **Execution** stage, tests are implemented and a **Result** is produced in the form of automatically generated reports, providing a clear and real-time view of the project, displaying all executed tests and information on the detected glitches.

Benefits

Celfocus Test Automation approach is integrated into Celfocus delivery model, which improves the overall quality of software development while synchronising tools, people and processes, and reducing testing costs.

The key benefits include:

- **Intelligent test automation:** automation allows changes to be made to the application as required while increasing test coverage and reducing defects;
- **Continuous delivery:** in Agile and DevOps practices, the need for frequent testing can be overwhelming. Automated testing enables a safer approach to quality in these models;
- **Better time-to-market,** due to increased speed of test execution and reduced software development time by automating and orchestrating provisioning and test execution;
- **Simplified infrastructure,** avoiding significant up-front costs when establishing a testing infrastructure;
- **Customer satisfaction,** as end-users' needs will be met more consistently.



Optimising Release Testing Through Automation

CASE STUDY

Siebel is one of Vodafone Portugal's BSS core IT system. Its upgrade was a critical piece to continue unleashing the value of the digital transformation that the company is undergoing. Testing was an essential part of that update project, and there was a strong need to automate and streamline the entire process to achieve smaller release cycles while bearing well-defined quality standards in mind.

Predominantly manual testing activities were being performed on this system, resulting in thorough and time-consuming software releases, as well as unproductive human resources management.

The goal was to **decrease release approval time** for small and large releases and to reduce business teams' workload and effort on tasks that could be

automated. A collaborative team, composed by Vodafone Portugal and Celfocus, built an automated testing ecosystem and, following the Agile Scrum methodology, used **Celfocus Automated Testing Framework** to automate Siebel regression tests.

As a result, validation cycles were shortened and manual activities reduced to the essential.

"Test automation is key for Vodafone Portugal to increase development lifecycle efficiency and to provide customers with improved service and experience. Celfocus Automated Testing Framework is a powerful tool to achieve high standards of automation."

Miguel André

IT Governance & Quality Assurance Manager
at Vodafone Portugal

Key Milestones

Automation of 377 test cases of regression and sanity tests, covering several functional Siebel work areas.

30 continuous testing pipelines created for different scopes, including mandatory and non-mandatory regression tests, sanity tests and tests per work area.

TDM integration to feed complex test data requests.*

*TDM is a Vodafone Portugal's proprietary Test Data Management tool, covering different samples of test data.

About Celfocus

Celfocus is a fast growing, global high-tech company with a reputation for developing and implementing successful projects and solutions that drive business value.

By combining a deep business knowledge with the understanding of different technologies, while never losing sight of the customer experience, Celfocus built a reputation leveraged on an unexcelled track record.

Serving Clients in 25+ countries, Celfocus helps organisations transform their business in order to improve competitive positioning and ultimately their performance.

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