



Perfecto

Seek Perfection

Glossary

Mobile DevTest Dictionary:
Terminology from A to Z

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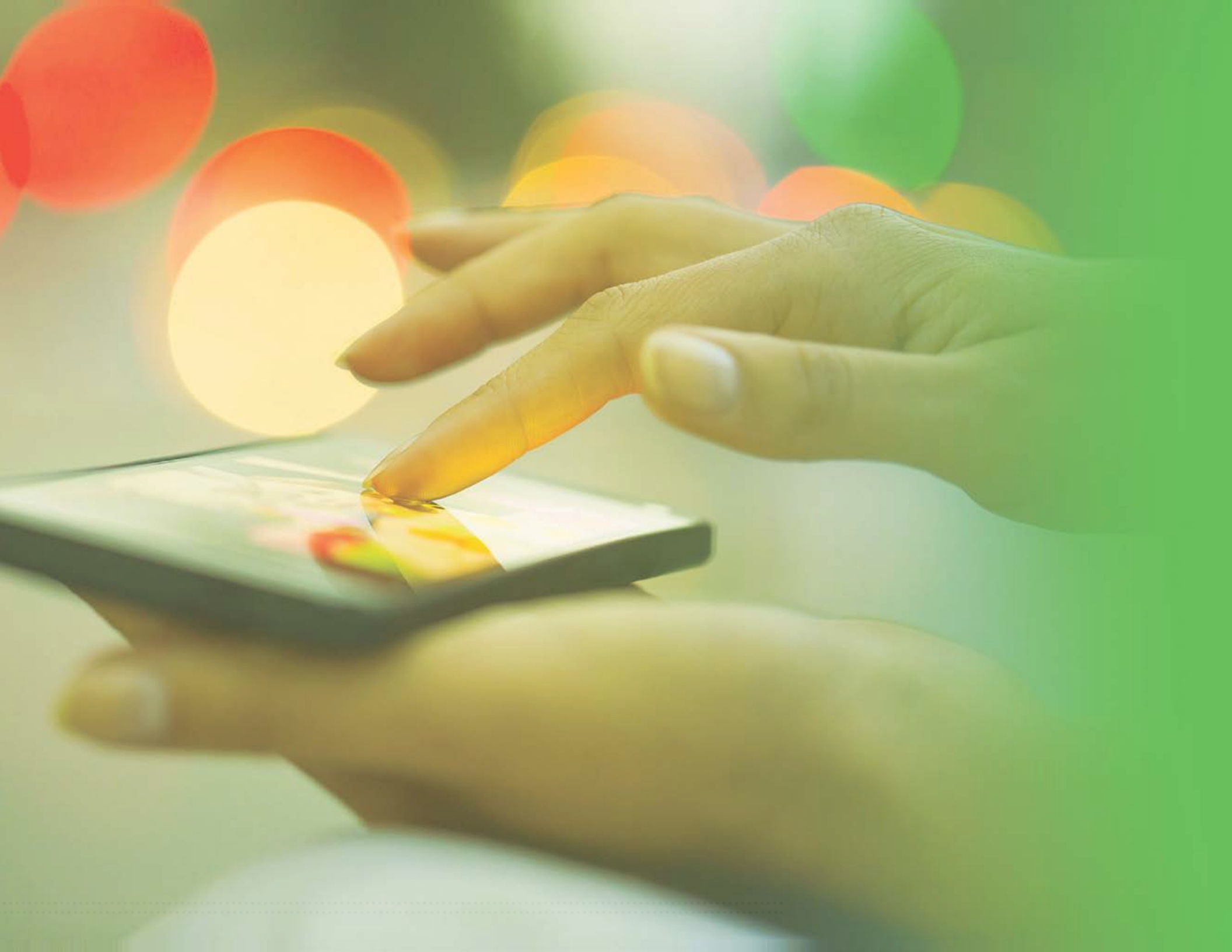










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Introduction

As a market-leader with experience spanning many industries and levels of mobile testing maturity, Perfecto has unique insights into the most critical tools and trends. We've used this inside information as the source for our "Mobile DevTest Dictionary: Terminology from A to Z," a go-to guide for developers, testers and practitioners to stay informed on the resources they need to excel at their jobs.

The DevTest Dictionary is divided into six categories with terms covering automation and CI tools, testing styles, agile best practices, and more that we'll be updating regularly. Happy reading!



Tools



Appium

Appium is an open source test automation framework for use with native and hybrid mobile apps. It drives iOS and Android apps using the WebDriver JSON wire protocol. All implementations of WebDriver that communicate with the browser, or RemoteWebDriver server use a common wire protocol. This wire protocol defines a RESTful web service using JSON over HTTP.

Perfecto supports Appium test execution and extends Appium capabilities inside the Perfecto Continuous Quality Lab with features such as visual object analysis and user condition testing (location, network coverage, etc).



Calabash

This software automation tool supported by Xamarin is based on the BDD concept and Cucumber tool. Calabash was extended by LessPainful (acquired by Xamarin) to mobile app testing based on the Ruby language. Calabash tests can be developed and executed on local devices or remotely using the Xamarin test cloud.

Perfecto supports Calabash test execution.



CI Tools

TeamCity, Bamboo, Gradle, Jenkins, TFS, BuildBot

Jenkins is supported by Perfecto. The plugin is in the public Maven repository and in the Jenkins official wiki page. Microsoft CI is also supported.

Development Languages

C#, Java, Objective-C, Swift, Ruby, Python – Most of these are supported by Selenium.

As part of Perfecto's Remote WebDriver implementation, Perfecto offers full support for the Selenium languages within Eclipse and Visual Studio IDEs.

Espresso

The Espresso testing framework, available in the [Android Testing Support Library](#), provides APIs for writing UI tests to simulate user interactions within a single app. Espresso tests can run on devices running Android 2.2 (API level 8) and higher. A key benefit of using Espresso is that it provides automatic synchronization of test actions with the UI of the app you are testing.

Perfecto supports the development and execution of Espresso Android UI tests on real devices in its CQ Lab.

Maven

Apache Maven is a software project management and comprehension tool. Based on the concept of a project object model (POM), Maven can manage a project's build, reporting and documentation from a central piece of information.

Remote WebDriver



RemoteWebDriver is a tool that helps execute Selenium and Appium tests. It is composed of two pieces: a client and a server. The client is your WebDriver test and the server is simply a Java servlet, which can be hosted in any modern JEE app server. The server will always run on the machine with the browser you want to test.

Perfecto supports Remote WebDriver to develop Selenium/Appium test code in any supported language.

Selenium

Selenium is a suite of tools that automates the testing of web browsers and mobile apps across various platforms. It has an add-on for the Firefox browser for web automation recording, and also mobile specific solutions such as MobileCloud WebDriver and Appium. The Selenium technology allows you to identify objects from applications using XPATH, CSS, Class Name and visual.

Perfecto supports the Selenium test framework for both mobile (iOS and Android) as well as desktop web testing.

WebDriver

Selenium WebDriver is the successor to Selenium RC (remote control). WebDriver accepts commands (sent in Selenese, or via a Client API) and sends them to a browser. This is implemented through a browser-specific driver (Android, Chrome, iOS), which sends commands to a browser and retrieves results. In mobile, there are specific WebDrivers for Android and iOS. For desktop, there are drivers for the relevant browsers (Chrome, Internet Explorer, FireFox, etc).

MobileCloud WebDriver is in phase out mode; we recommend customers use the Remote WebDriver solution.

Selenium Grid

Selenium Grid supports distributed test execution by allowing customers to run multiple tests at the same time on different machines against different browsers and devices.

Mobile App Styles



App Instrumentation

The method of bundling a source code library within an application, or changing its code to get native object support.

This test automation supporting technique allows dev and testers access to the app's native object properties. It's most commonly used in iOS platform test automation. Perfecto provides an app instrumentation solution to get fully native and DOM object identification for hybrid apps.

Hybrid Application

Hybrid apps run inside a native container, and leverage the device's browser engine (but not the browser) to render the HTML and process the JavaScript locally.

Web Application

A web app is an app written in HTML/JavaScript that runs within the platform browser (Chrome, Safari, Android Native Browser) and requires constant network connectivity to access the server and retrieve data. On the other hand, native apps run locally on the device platform and can be launched independently from the browser.

Responsive Web App

Responsive app design works on the principle that a single fluid website can look good on any device. Responsive websites use media queries, flexible grids, and responsive images to create a consistent user experience that adapts and changes across digital platforms such as mobile, web and IOT.

Perfecto enables customers to test RWD (responsive web design) through its Selenium Remote WebDriver solution. Customers can build a Selenium Grid and execute Selenium tests in parallel on desktop browsers and mobile devices.

Adaptive Web App

Like responsive, adaptive design attempts to optimize the experience across platforms. But instead of one flexible design, adaptive design detects the device and other features, and then provides the appropriate feature and layout based on a predefined set of viewport sizes and other characteristics.





Objects Defined

DOM Objects

The list of objects for a mobile web/hybrid application on which the test automation developer will perform actions (press the buttons, etc.).

The DOM is represented as a tree of objects where each object is related to the others, making the path from one to the other reasonable. Getting DOM objects analysis from the native browser (Safari) is not always easy. Perfecto is among only a few vendors providing such support for both web and hybrid apps.

Native Objects

These are mobile OS-specific objects that are identified by the unique properties that the app developer assigned to them. For example, XPATH retrieves and provides the native objects properties from a mobile/hybrid app.

Perfecto supports OS level native objects for both iOS and Android. Such objects can be identified through XPATH, CSS or other methods.

System Level Control

The ability to interact with the mobile operating system outside of the application under test (change device settings, press the Home button , etc).

This is essential for various use cases, better test coverage and continuous integration.

Visual Objects

Usually known as OCR (Optical Character Recognition) engines. OCR essentially uses a smart software engine that converts scanned images of handwritten, typewritten or printed text into machine-encoded text.

Perfecto supports visual object analysis as part of its test automation solution.

XPATH

XML Path Language is a query language for selecting nodes (i.e., locating data or objects) from an XML document.

As part of its Selenium support, Perfecto supports XPATH object identification in native, web and hybrid apps.





Software Testing Styles

Advanced functional testing

The practice of adding simulated real world conditions and out-of-application context events to functional test flows to ensure that the application functions in real world conditions.

Perfecto's Wind Tunnel enables advanced functional testing on real devices.

Availability

Measurement of the availability of key steps of the application.

ATDD

Acceptance Test-Driven Development is a technique used to bring customers into the test design process before coding begins. It is a collaborative practice where users, testers and developers define automated acceptance criteria. ATDD helps ensure that all project members understand precisely what needs to be done and implemented. Failing tests provide quick feedback that requirements are not being met. The tests

ATDD Cont.

are specified in business domain terms. Each feature must deliver real and measurable business value. If a feature doesn't trace back to at least one business goal, then it may not be necessary.

Integration Testing

The phase in software testing in which individual software modules are combined and tested as a group. It occurs after unit testing and before validation testing. Integration testing uses modules that have been unit tested, groups them in larger aggregates, applies tests defined in an integration test plan to those aggregates, and outputs the integrated system as ready for system testing.

Longevity Testing

The practice of testing the application behavior along specified user flows over an extended period of time and iterations to ensure application functionality over an extended period of usage. Typical aspects of such testing is memory leaks and battery drain.

As part of Perfecto's performance testing and Wind Tunnel capabilities, customers can get insights into app CPU, memory and other resource consumption.

Network Virtualization

This technology enables pre-production teams to model and simulate network conditions as accurately as possible. Network virtualization provides predictability of the user experience in real world conditions in production to optimize the application behavior in such conditions.

Perfecto offers NV capabilities as part of the manual, automation and performance products in its private hosted cloud deployments.

Performance Optimization

The practice of analyzing the application design and behavior (availability and responsiveness of KPIs), as well as underlying data (vitals, network analysis) to ensure availability of key steps in the application.

Performance Testing



The practice of measuring and optimizing the behavior of an application in terms of availability and responsiveness to ensure acceptable user experience in real-world conditions. Performance testing can come in two flavors: single user performance test and load/stress test.

Perfecto offers a full mobile performance testing solution that can be leveraged either through integration with Jmeter or HP LoadRunner.

RUM Monitoring

Real User Monitoring – A method of monitoring production apps by embedding a piece of software (SDK) within the application that communicates real-time analytics data about the app from the device running back to the monitoring server.

Using this method allows more use of analytics -based information. However, it's very hard to pinpoint and identify the root cause of the issues because the reports are sent from a user's private device where production teams do not have access.

Service Virtualization

A method to emulate the behavior of specific components in heterogeneous component-based applications such as API-driven applications, cloud-based applications and service-oriented architectures. It is used to provide software development and QA/testing teams access to dependent system components that are needed to exercise an application under test (AUT), but are unavailable or difficult-to-access for development and testing purposes.

Perfecto provides mobile SV through its partnership with CA and the CA Lisa for Mobile solution.

Single User Performance Testing

The practice of adding simulated real world conditions and out-of-application events to functional test flows to ensure the application's responsiveness and availability in real world conditions.

Single User Profiling

A set of tests performed as part of the early development stages, typically in-sprint, maybe nightly. Unlike load and stress testing, typically done out of the sprint, the single user profiling increases software reliability and usability by testing the software against various simulated real world conditions such as network conditions and application interruptions. The reporting includes measuring device vitals and memory leaks as well as responsiveness on different platforms. With this practice, development teams can reveal performance issues in advance and be more prepared for the performance testing phase.

Synthetic Monitoring

A monitoring method that's performed in a "clean room environment" (lab) to detect, analyze and fix production issues as soon as they are identified. No app changes are required to execute synthetic monitoring scripts.

Perfecto supports this method of monitoring through integrations with HP BSM and AlertSite (SmartBear).



System Testing

System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic.

Perfecto customers can develop system tests for any of their mobile app styles in the Perfecto CQ Lab in the cloud.

Smoke Testing

Preliminary testing to reveal simple failures severe enough to reject a prospective software release. A subset of test cases that cover the most important functionality of a component or system is selected and run to ascertain if crucial functions of a program work correctly.

Perfecto customers can develop smoke subset tests for any of their mobile app styles in the Perfecto CQ Lab in the cloud.

Sanity Testing

Basic test to quickly evaluate whether a claim or the result of a calculation can possibly be true. Sanity Testing is a simple check to see if the produced material is rational (that the material's creator was thinking rationally). The point of a sanity test is to rule out certain classes of obviously false results, not to catch every possible error. The advantage of a sanity test, over a complete or rigorous test, is speed.

Perfecto customers can develop and execute sanity tests for any of their mobile app styles in the Perfecto CQ Lab in the cloud.

Security Testing

Security testing is a process intended to reveal flaws in the security mechanisms of an information system that protects data and maintains functionality as intended. Due to the logical limitations of security testing, passing security testing is not an indication that flaws don't exist or that the system adequately satisfies the security requirements.

Typical security requirements may include specific elements of confidentiality, integrity, authentication, availability, authorization and non-repudiation. Actual security requirements depend on the security requirements implemented by the system.

Regression Testing

A type of software testing that seeks to uncover new software bugs, or regressions, in existing functional and non-functional areas of a system after changes such as enhancements, patches or configuration changes have been made to them.

The purpose of regression testing is to ensure that changes such as those mentioned above have not introduced new faults. One of the main reasons for regression testing is to determine whether a change in one part of the software affects other parts of the software.

Perfecto provides various test automation solutions to run regression tests on real devices and browsers.

Regression Testing Cont.

Common methods of regression testing include re-running previously completed tests and checking whether program behavior has changed and whether previously fixed faults have reemerged. Regression testing can be performed to test a system efficiently by systematically selecting the appropriate minimum set of tests needed to adequately cover a particular change.

Unit Tests

Unit testing is a software testing method by which individual units of source code and usage and operating procedures are tested to determine if they are fit for use.

Perfecto customers can integrate with various IDEs such as Eclipse and Visual Studio to develop JUnit, TestNG and other unit tests within the Perfecto CQ Lab in the cloud.

TestNG JUnit

User Condition Testing

The mimicking of an end-user environment using personas along with their environment and behavior traits such as

network conditions, devices and locations, and apps running in background. These conditions are all embedded into a test automation scenario to enhance test coverage and increase app quality.

Perfecto offers user condition testing in its CQ Lab through the automation capabilities of its Wind Tunnel™ product.

MAIN TRAITS:

- Traveler who's always connecting to new networks, Wi-Fi and carrier
- Loyal Apple customer, relies on multiple devices
- Big user of social, banking, and enterprise apps

TESTING REQUIREMENTS:

- Test for newest Apple smartphones, tablets, and smartwatches
- Prepare for apps conflicts, interruptions, alerts, and changing networks



Georgia, 47
Corporate Road Warrior

Vitals

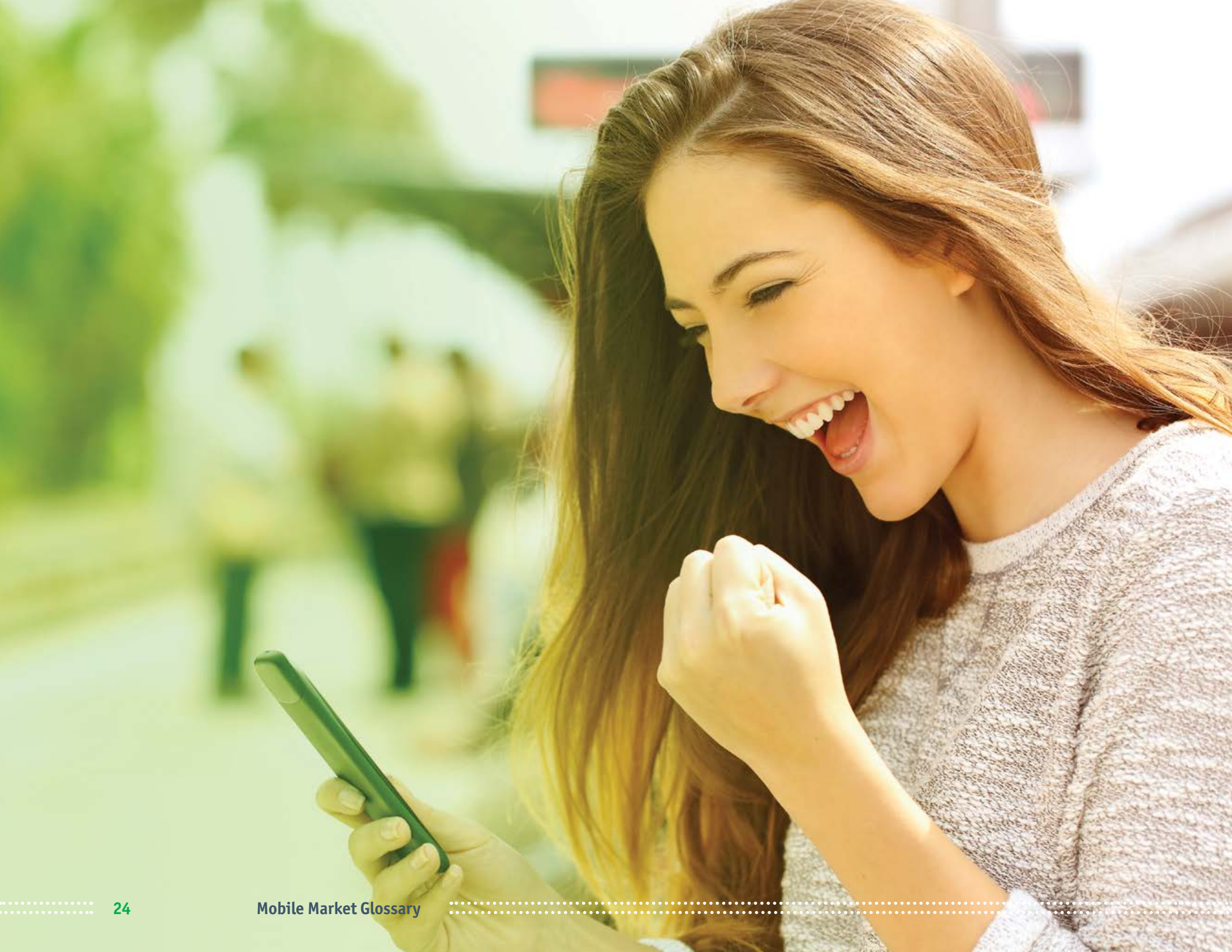
Metrics indicating the state of the client/hardware/OS, as well as the environment. Examples include CPU, memory, data throughout and HTTP errors. Vitals are used to help shed light on the cause of a delayed response in the application.

Perfecto provides device related vitals such as logs and CPU as well as app level vitals.

Production Insights

Tests performed post production release on a continuous basis to provide key insights around response time, app availability, regressions and other issues.

Can be performed through Perfecto's synthetic monitoring or test automation solutions.





Dev & Agile Related Terms

BDD

Behavior-Driven Development (BDD) is a software development process based on test-driven development. BDD allows DevTest teams to collaborate earlier in the SDLC around functional and user experience testing of an app. The advantage of BDD is it makes development easier because it describes the business logic and outcomes of specific use cases.

Cucumber and Calabash are desktop/mobile tools supporting this technique.

Perfecto provides basic support for Calabash, a BDD related tool used by developers and testers through the Ruby development language.

Continuous Integration (CI)

The software engineering practice of merging all code copies to a shared mainline several times a day.

When embarking on a change, a developer takes a copy of the current code base on which to work. As other developers submit changed code to the source code repository, this copy gradually ceases to reflect the repository code. Not only can the existing code base change, but new code can be added as well as new libraries and other resources that create dependencies and potential conflicts.

The longer a branch of code remains checked out, the greater the risk of multiple integration conflicts and failures when the developer branch is reintegrated into the main line.

Continuous integration involves integrating early and often to avoid the pitfalls of “integration hell.” The practice aims to reduce rework and thus reduce cost and time.

Perfecto customers can implement their continuous integration process in the cloud using Jenkins CI, Microsoft Visual Studio Team Services or TeamCity.

Continuous Delivery (CD)

Is a software engineering approach in which teams produce software in short cycles, ensuring that the software can be reliably released at any time. The CD process helps reduce the cost, time and risk of delivering changes and facilitates more incremental updates to applications in production.

Continuous Quality

Continuous Quality is a methodology for embedding quality activities into every step of the SDLC process, from design through build to production based on supporting processes, tools and lab infrastructure that's tailored for the intensity of the process.

Successful continuous quality accelerates time to market, drives faster and more frequent releases and helps reduce escaped defects to production by managing risk in an automated way as early as possible.

Perfecto enables Continuous Quality through its CQ Lab in the cloud.

Continuous Quality Lab

The Continuous Quality Lab (CQ Lab) is the required infrastructure and tools needed to conduct tests, measurements and analysis. It allows teams to be fully integrated into the Agile / DevOps process and replicate the end user conditions early in the life cycle. The CQ Lab supports 24/7 continuous operation with a production grade SLA, and consistency across the different phases of the DevTest lifecycle, minimizing the time it takes to resolve issues while speeding up time to market.

The CQ Lab is Perfecto's core offering.

Development Languages

C#, Java, Objective-C, Swift, Ruby, Python. Most of these are supported by Selenium.

As part of the Perfecto Remote WebDriver implementation, Perfecto offers full support for all the Selenium languages.

IDE

Integrated Development Environment, an environment used by software developers to develop, debug, build and deploy their application. The common IDEs in the mobile space are Xcode for iOS apps (MAC environment), Android Studio (Google Tool suite), Eclipse (main IDE for Android), TFS and IntelliJ.

Perfecto supports the Eclipse IDE and Microsoft Visual Studio for test code development as well as the Perfecto web-based proprietary IDE.

Kanban

Kanban is a method for managing knowledge work with an emphasis on just-in-time delivery while not overloading team members. With this approach, the process—from definition of a task to its delivery to the customer—is displayed for participants to see and for team members to pull work from a queue. Kanban in the context of software development can mean a visual process management system that tells developers what to produce, when to produce it and how much to produce.

SCM

Source configuration manager is the task of tracking and controlling changes in the software, part of the larger cross-discipline field of configuration management. SCM practices include revision control and the establishment of baselines. If something goes wrong, SCM can determine what was changed and who changed it. If a configuration is working well, SCM can determine how to replicate it across many hosts.

Shift Left

A trend where dev teams and testing teams collaborate as one to deliver better software faster through CI/Agile and early testing that utilizes efficient test automation, performance and unit testing.

Software Build

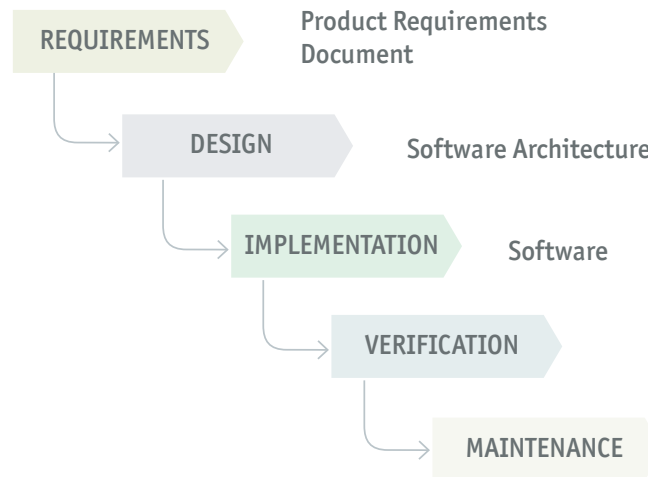
The result of a compilation of software code. In mobile, it can be an Android app (.APK) or iOS app (.IPA) that can be executed on the target platform. In other words, a software build is a binary artifact that can be deployed and executed on the target platform (device, browser).

TDD

Test-Driven Development (TDD) is a software development process that relies on the repetition of a very short development cycle. First, the developer writes an initially failing automated test case that defines a desired improvement or new function; then the developer produces the minimum amount of code to pass that test; and finally re-factors the new code to acceptable standards.

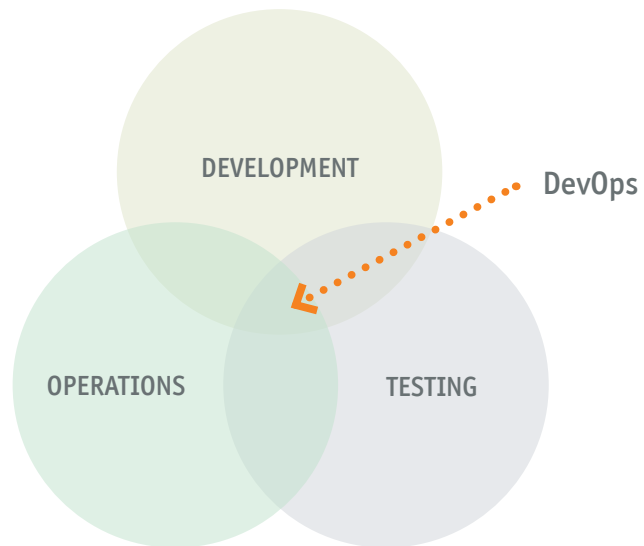
Waterfall

The waterfall model is a sequential design software development processes in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of conception, initiation, analysis, design, construction, testing, production/implementation and maintenance.



DevOps

A culture or practice that emphasizes the collaboration and communication of both software developers and other IT professionals to automate the process of software delivery and infrastructure changes. The purpose is to establish a culture and environment where building, testing and releasing software can happen rapidly, frequently and more reliably.





Common Testing Terms

GitHub

GitHub is a web-based Git repository hosting service. It offers all of the distributed revision control and source code management (SCM) functionality of Git as well as its own features. Unlike Git, which is strictly a command-line tool, GitHub provides a web-based graphical interface and desktop as well as mobile integration. It also provides access control and several collaboration features such as bug tracking, feature requests, task management and wikis for every project.

Developers use GitHub to get code samples and learn about community best practices (including Selenium, Appium or other technology-based shared code).

Key Performance Indicators (KPI)

Measurable metrics indicating the responsiveness and availability of key steps in the user flow, typically measured in a performance test.

MTTK

Mean Time to Know – This is a measurement of the time it takes a monitoring/ops/DevOps team to be notified about defects, performance degradation or outages.

Perfecto offers production monitoring 24x7 to reduce the MTTK. Because monitoring teams get immediate real-time alerts as issues are identified, faster MTTK helps decrease the MTTR (Mean time to resolution).

MTTR

Mean Time to Resolution is the time it takes from the moment an outage/production defect is identified until it gets resolved and fixed in production.

Perfecto offers production monitoring with debugging information, allowing teams to easily pinpoint the root cause of the issue and resolve it.

Persona

A detailed definition of an app user. Personas are defined by unique traits such as location, devices, networks, background apps, and more.

Perfecto's Wind Tunnel enables persona-based testing as part of its test automation solution.

Stack Trace

Programmers commonly use stack tracing during interactive and postmortem debugging. Users may see a stack trace displayed as part of an error message, which the user can then report to a programmer.

A stack trace allows tracking the sequence of nested functions called—up to the point where

Stack Trace Cont.

the stack trace is generated. In a postmortem scenario, this extends to the function where the failure occurred (but was not necessarily the cause). Sibling function calls do not appear in a stack trace.

Stack Overflow

A website that serves as a platform for programmers to become members and actively participate. Members ask, edit and rate questions and answers about programming topics in a fashion similar to a Wiki or Digg. Stack Overflow users can earn reputation points and “badges.”

About Perfecto:

Perfecto enables exceptional digital experiences. We help you transform your business and strengthen every digital interaction with a quality-first approach to creating web and native apps, through a cloud-based test environment called the Continuous Quality Lab. The CQ Lab is comprised of real devices and real end-user conditions, giving you the truest test environment available.

More than 1,500 customers, including 50% of the Fortune 500 across the banking, insurance, retail, telecommunications and media industries rely on Perfecto to deliver optimal mobile app functionality and end user experiences, ensuring their brand's reputation, establishing loyal customers, and continually attracting new users. For more information about Perfecto, visit www.perfectomobile.com, join our community at community.perfectomobile.com, and follow us on Twitter at [@PerfectoMobile](https://twitter.com/PerfectoMobile).



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