

DIGITAL INDUSTRIES SOFTWARE

Questa Verification IQ solution

Collaborative data driven verification powered by analytics

• Solution benefits

- Faster turnaround times
 - Accelerate root cause exploration
 - Automated debug preparation
 - Collaboration data management
- Accelerated verification closure
 - Find coverage holes quicker
 - Collaboration analysis
 - Analytical navigation
- Resource management
 - ML assisted test selection
 - Automated results-based actions
 - Compute efficiency

Summary

The growing complexity in the design and verification of ICs amplifies the challenges of getting to market on time with first-time success. Those challenges associated with turnaround times and verification closure require greater efficiency and acceleration of all verification tasks, which can be achieved only by becoming data driven. Preserving historical design and verification data allows experienced engineers to make judgements, but with modern high-performance computing and mass storage this data can be augmented with predictive and prescriptive analytics. This is known as big data.

Big data is transforming all industries, enabling them to innovate their products more rapidly and improve many aspects of our lives. EDA is powering these transformations. Verification needs to transform in step, so we can predict which test to run next, the root cause of a failure, and what stimulus is required. Questa™ Verification IQ is the Siemens EDA collaborative, data-driven verification solution that transforms the verification process using analytics, collaboration, and traceability.

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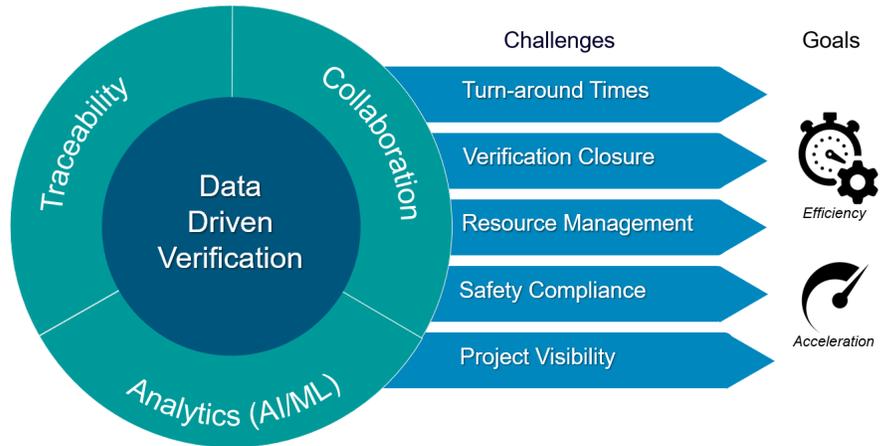
Questa Verification IQ solution

• Solution benefits (cont.)

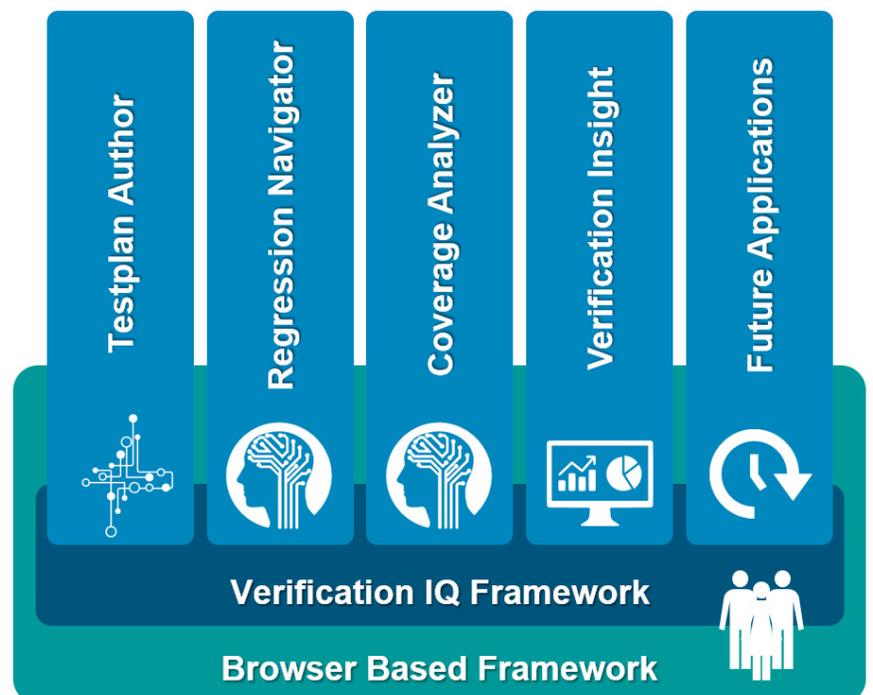
- Functional safety compliance
- Integration with lifecycle management
- Requirement traceability to verification and implementation
- Project visibility
 - Collaboration data availability
 - Actionable data
 - Project progress management

• Application benefits

- Testplan Author
 - Built on the Questa Unified Coverage DataBase (UCDB) testplan infrastructure to seamlessly integrate within existing verification flows
 - Take advantage of verification process guidance to follow plan and requirements driven methodologies
 - Associate design requirements with testplan elements and RTL implementation to deliver full, safety compliant traceability
- Regression Navigator
 - Built on the Questa verification run manager infrastructure to provide consistency and coherence with existing verification flows
 - Failure signature analysis to improve regression efficiency and turnaround times
 - ML assisted test selection to optimize regression run times and enable early debug



Testplan Author is our plan and requirements driven front-end, providing a collaborative testplan editor to capture the testplan that drives the verification process. Testplan Author is integrated tightly with the other Questa Verification IQ applications and supports coverage from multiple engines. It employs the power of lifecycle management through integration with ALM tools, such as Siemens Polarion™. Using Open Services for Lifecycle Collaboration (OSLC), Testplan Author allows data to be both managed within each domain and dynamically available to each domain. It maintains a tight digital thread using requirements tools, like Polarion, and by providing complete traceability — from requirements to implementation and verification results — for safety compliance. OSLC provides the ability to have an agnostic solution to support other tools like Siemens Teamcenter® and IBM Engineering Requirements Management DOORS Next.



Questa Verification IQ solution

- **Application benefits (cont.)**

- Coverage Analyzer
 - Bring team-based analysis to the Questa UCDB to drive an efficient collaborative closure process
 - Unique analytics for accelerated understanding to navigate, guide, and prioritize for the most effective route to closure
 - Pinpoint the biggest holes and match similar, formed patterns using ML accelerated coverage closure
- Verification Insight
 - Centralized dynamic portal for multi-project visibility to drive planning, organization, and management to achieve verification goals
 - Understand past performance and make projections with historical multiple and cross-domain metric analysis
 - Optimize verification environments with predictive and prescriptive verification analytics

Regression Navigator is the collaborative front-end to our regression engine, providing visibility and controllability of regressions in a device and OS independent interface. Integrated tightly with Questa Verification Run Manager (VRM), it enables collaborative launching of regressions and the ability to analyze results across multiple regressions, from multiple users, across multiple projects.

Regression Navigator's power is not only due to the collaborative running of regressions but also in regression analysis. With all results stored in a single place, it is possible to gain insights into results across the history of a test. This allows analytics to be applied to data to provide information that would be hard to correlate any other way. Automated bucketing of failures is achieved by analyzing the results of each test in the regression and applying ML to improve debug turnaround time.

Coverage Analyzer accelerates coverage closure by applying analytics to the coverage closure problem. By providing team based collaborative closure and sharing URLs, collaborative exclusions, and many more team-based features, it improves the understanding of the coverage model, supporting code coverage, functional coverage, and testplan coverage. Coverage Analyzer applies analytics to visualizations, giving insights into coverage in different dimensions, using heat maps, distribution graphs, network graphs, expression trees, and much more. Customers claim 3–5X faster closure with Coverage Analyzer compared to structural-based coverage analysis tools.

Verification Insight provides the ability to build project metric dashboards. A major benefit is its ability to capture verification data that would traditionally be lost in most user environments. These metrics can be viewed in various dashboards made up of customizable widgets. Although Verification Insight is tightly integrated with the other Questa Verification IQ applications, it can be used as a standalone tool. Verification Insight concentrates on providing visualizations and insights into what happened, and why, utilizing trending data, gauges, and cross analytics.

Verification Insight stores data throughout the verification process and across multiple projects, with features for historical data management. This allows ML based predictive and prescriptive analytics to be applied to accelerate and improve the verification process.

Questa Verification IQ solution

• Specifications

- Data extractors
 - Questa UCDB
 - Questa VRM
 - Generic time-based metrics
- Server hardware requirements
 - Minimum four cores; eight cores recommended
 - Minimum 16 GB RAM
 - Minimum 50 GB disk space
- Server supported operating systems
 - Linux® Redhat®/CentOS 7 and 8
- Supported browsers
 - Microsoft Edge 80+
 - Google Chrome 80+
 - Mozilla Firefox 70+

Power of the browser

Questa Verification IQ is implemented in a web-based application framework providing scalable verification management with zero install for device and OS independence. It supports public, private, and hybrid cloud configurations with native collaboration and centralized data access. Questa Verification IQ presents all tasks within a familiar, modern, user interface protected by a secure, login-based licensing model, and it supports URL sharing and user-based notification systems.

Applying ML

Questa Verification IQ employs predictive and prescriptive verification analytics to accelerate closure, accelerate debug turnaround time, and provide regression efficiency. Questa Verification IQ facilitates identifying coverage holes, uncovering patterns within data, prioritizing tests that are predicted to fail, and identifying tests more likely to increase coverage. Applying ML analytics provides quicker navigation and highlights possible causes of low coverage while supporting what-if-analysis.

As a part of the Siemens Questa Advanced Verification, the Questa Verification IQ solution supports verification management, debug, and coverage.

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