Validation and Automated Validation

tracelink
Life Sciences Cloud

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Introduction

Companies across the pharmaceutical supply chain are wrestling with new and evolving regulatory laws for product serialization. At the same time, customers and suppliers are introducing their own business demands for new information.

Under the FDA's 21 CFR Part 11, any systems used to exchange electronic records in a regulatory environment must be formally validated. As software is updated to keep up with changing legal and business demands, serialization systems must be revalidated more frequently than ever before.

Traditional computer system validation (CSV) can be resource- and time-intensive, meaning that critical changes may not be made for months—or even years. Automated validation has emerged as a game-changing opportunity to maintain a fully compliant serialization platform with lesser impact on budget and staff resources.

To understand what's involved with the new era of serialization validation and how to best to tackle it, **Michael Owings, VP of Quality and Regulatory Compliance at TraceLink**, answers common validation questions and explains the growing importance of automated validation.

MICHAEL OWINGS

VP of Quality & Regulatory Compliance

At TraceLink, Owings is responsible for strengthening the company's global compliance strategy and operational framework in accordance with all government and industry regulations.

Owings is responsible for managing the quality strategy and framework, and providing oversight and governance to the validation of systems and delivery of services, sound incident handling, and security in collaboration with the Chief Information Security Officer (CISO).

Validation Standards

QUESTION 1

How is validation defined under Title 21 CFR Part 11?

In 1997, the FDA passed Title 21 CFR Part 11 to regulate systems that handle electronic records and electronic signatures used in relation to FDA-regulated products, including human drugs and biologics.

While computer system validation (CSV) is not a new practice, Title 21 introduced time and cost challenges for companies that must be able to consistently revalidate their systems when updated.
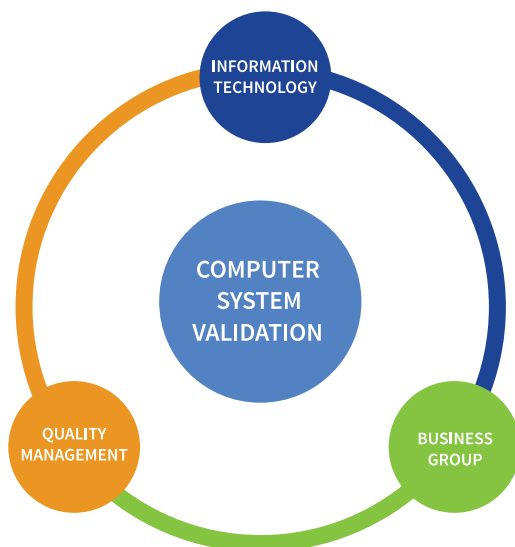
The FDA defines validation as "establishing documented evidence that provides a high degree of assurance that a specific process will consistently produce a product meeting its predetermined specifications and quality attributes."

The phrase "high degree of assurance" enables companies to determine for themselves the appropriate level of testing needed for the system being implemented.

QUESTION 2

What is GAMP and what is GAMP 5?

Good automated manufacturing practice (GAMP) is a set of established guidelines for the use of computerized systems in the pharmaceutical industry.

Developed by the International Society for Pharmaceutical Engineering (ISPE), GAMP addresses manufacturers' standard operating procedures (SOPs) in order to ensure the quality of drug products. Building quality into the design throughout each stage of manufacturing is a key component of GAMP.

GAMP 5 refers to how automated CSV is categorized by risk and how it is documented in pharmaceutical manufacturing. The guidelines provide a flexible, risk-based approach to compliance based on GxP.

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QUESTION 3

What are the GAMP 5 categories, and which category does TraceLink fall under?

GAMP 5 introduced four categories in 2008 to ensure automation processes meet required quality standards. ("Category 2 – Firmware" was removed after GAMP 4.)

The following are used to categorize pharmaceutical software applications based on functionality:

Category 1

Infrastructure software. Includes operating systems and database managers that host application software. *Does not require validation.*

The TraceLink Life Sciences Cloud operates in the Amazon Web Services (AWS) cloud. We consider the AWS infrastructure as Category 1, and we validate our applications, which are considered Category 4.

Category 3

Non-configurable software. Includes commercial off-the-shelf software (COTS), laboratory instrument/software. *Some validation required for automated business processes.*

Category 4

Configurable software. In the serialization environment, this includes serialization software provided by an EPCIS vendor. Other systems in this category include LIMS, SCADA, DCS, and CDS. *Requires a higher degree of validation complexity than Category 3 due to the modifications required to meet unique business requirements.*

The TraceLink Life Sciences Cloud falls under Category 4 because its software is highly configurable to meet critical user specifications.

Category 5

Bespoke or customized software. These applications tend to be written in house and with a high level of customization to fulfill user requirements. *The high level of customization in this category means there is a greater risk of error and therefore a critical need for validation.*

Validation Processes

QUESTION 1

What is required for correct and thorough validation of a serialization solution?

Once you have implemented a serialization and track and trace program and completed your initial validation, you will need to revalidate the corresponding systems when new software is released in order to meet this high degree of assurance and maintain the system in a validated state.

QUESTION 2

What activities are involved when my company performs the IQ, OQ, and PQ of my serialization solution?

To ensure your technology is performing as intended, CSV includes:

1 Installation qualification (IQ)
To certify the full set of installation activities for each software component, including version, date, listing of components, and migration tasks when required.

2 Operational qualification (OQ)
To perform QA and testing on an independent QA test platform with the identical configuration and install procedures that are used for the platform's testing and development environments.

Performance Qualification (PQ)
3 To simulate different use cases and environments with the goal of reducing customer issues. Executing PQ validation tests is essential in an environment where evolving regulations necessitate frequent code changes.

QUESTION 3

How many dedicated resources do we need to successfully manage our validation?

Validation can represent a considerable overhead cost. The approach your company takes to resource allocation will vary based on the size of your organization and available resources, as well as the scale of your serialization portfolio.

In addition, your strategy will depend on what your change control process is and how you use your serialization and track and trace system.

Facing new serialization and track and trace requirements, manufacturers are struggling to keep up with staff resourcing and budgetary impacts.

According to a September 1, 2017, TraceLink poll of more than 50 pharma companies and CMOs:

3 of 4
Are dedicating internal staff to validation. (20% of these are assigning 6+ FTE.)

1 in 2
Are spending at least 4+ weeks on validating every update.

1 in 3
Are spending at least $60K annually on validation.

How does risk-based validation improve the process of CSV?

To meet the newer demands of CSV under Title 21, life sciences companies have begun moving from a classic, all-encompassing validation strategy to a more targeted methodology based on risk.

In the classic validation approach, functional risk is not assessed and all requirements are essentially assigned the same risk level of "high."

A risk-based approach enables you to execute a high volume of use cases and a more thorough validation of systems than classic methodologies while minimizing lengthy validation processes.

A functional risk assessment is a document that is used to analyze the risk level of individual functions in a software system so that the level of testing can be scaled to the importance or criticality of the function.

During the risk assessment, a predefined risk category is assigned based on the system's intended use and complexity.

Based on risk level, you may determine you only want to revalidate a particular aspect—such as a configuration or workflow—rather than the entire system. Or you may decide revalidation is not necessary because there is no impact to your business processes.

The risk assessment process helps guide the specifications, test scripts, and other elements of the CSV documentation for adhering to GAMP 5 guidelines.

> **"** A risk-based approach enables you to execute a high volume of use cases and a more thorough validation of systems than classic methodologies while minimizing lengthy validation processes. **"**

Validation of TraceLink Software

QUESTION 1

Do I normally need to revalidate TraceLink software after each patch or only with major releases?

Most of our customers only revalidate with a major release and not after every patch.

You can perform an impact assessment using a risk-based approach to determine whether any validation is necessary. Once you have reviewed the release notes and product documentation to determine what changed in the software, you will know if you are impacted.

For minor releases pertaining to custom mapping or a country module that doesn't apply to your organization, zero testing or validation is required. However, you might revalidate or retest if you recently reported an issue that is addressed in the release.

QUESTION 2

What does TraceLink do as part of the standard software subscription to ease the burden of validation?

Our dedicated QA teams design our automated testing code to look exactly like a customer feed. We go beyond what other EPCIS solution providers are performing for automated regression testing to ensure your software runs the way it is supposed to.

TraceLink uses 330 Selenium UI tests and provides thousands of automated tests to ensure the software works. All in all, we eliminate the cost of roughly 2,800 hours of testing that would take a team of 12 dedicated QA engineers 4-6 weeks to complete for each release.

Everything executed during IQ and OQ is summarized and provided to you. All components in QA are identical to those deployed and tested in production, so once you've finished the PQ, full validation of the system is complete.

QUESTION 3

What is a Partner Integration Certificate? How is it used as part of my validation processes?

For brand owners, CMOs, and 3PLs, we take on the responsibility of integrating our customers' trade partners. As part of this activity, we will work with your trade partners to establish their integration to the TraceLink Life Sciences Cloud.

As part of your validation documentation, the Partner Integration Certificate provides evidence that the connection and integration with your trade partner is functioning correctly. Should the connection or transaction-message format of your trade partner change, we will provide additional testing support for the trade partner and recertify the integration.

QUESTION 4

What's next for the future of validation in a serialized life sciences supply chain?

To boost efficiency and cut costs, the industry is seeking new, scalable, automated processes to manage the rapid pace of change in today's regulatory and quality environment.

Comprehensive automation of all your validation processes, free of human error, is the next step.

In September 2017, TraceLink introduced Automated Validation Manager (AVM) to offer a complete end-to-end validation solution for our serialization and track and trace system.

> " TraceLink uses 330 Selenium UI tests and provides thousands of automated tests to ensure the software works. "

About Automated Validation Manager

QUESTION 1

What is Automated Validation Manager (AVM)?

Automated Validation Manager (AVM) is a cloud-based service that automates the entire validation life cycle of the Life Sciences Cloud, with automated testing and confirmation to ensure all current software capabilities meet GxP compliance in accordance with industry standards such as GAMP 5.

When we provide software updates that maintain your compliance, AVM ensures all current TraceLink software capabilities are performing as intended. With AVM, you can access your validation documents—at the time of each release—without the need for manual, paper-based validation procedures.

QUESTION 2

How does AVM use the functional risk assessment to determine the business impact?

Each requirement will be assessed for its GxP impact, business impact, functional impact, and error exposure. Based on the results of these assessments, each requirement is assigned a severity level of high, medium, or low.

This risk class determines the testing as it relates to validation. The guidelines for how your requirements are assessed are available in the functional risk assessment.

QUESTION 3

What resources are required for AVM?

AVM can do all the validation and testing—including the PQ/UAT—for you. But if you still want to supplement your own validation processes, AVM provides everything you need to execute your validation strategy based on your own internal policies.

If you are a virtual manufacturer that outsources packaging and distribution, AVM will provide much of the services and documentation you need for validation. You may determine that the combination of our executed IQ/OQ—and extensive AVM documentation for coverage of PQ/UAT—are sufficient for you to consider the system validated.

If your company blends internal resources with a ramp-up of external consultants at the time of a major release, AVM can ease the burden of budgeting and resource management. The AVM subscription model allows you to control and confidently predict validation costs.

If you are a larger global enterprise, you may leverage AVM to supplement your organization's own internal validation efforts. Ultimately, you will be able to determine what documentation you require based on your risk assessment of the TraceLink Life Sciences Cloud and your serialization project.

QUESTION 4

How does AVM support the validation of my internal packaging lines?

AVM validates that interfaces used by a packaging line management system (LMS) function as intended when requesting serial numbers, receiving serial numbers, and providing disposition and aggregation information against those serial numbers. Validation of packaging line hardware and the LMS itself are handled by the customer.

How does AVM support integrations with specific CMOs, 3PLs, or other trade partners?

AVM validates that interfaces a CMO, 3PL, or other trade partner use to send or receive information are performing correctly. Testing of these integrations should have already been completed and verified as part of the initial onboarding of that CMO, 3PL, or trade partner.

The objective evidence of this partner integration is provided through the TraceLink Certified Partner Integration Certificate for that partner.

QUESTION 6

As part of a core GxP strategy, how is AVM validated?

We validate AVM as new functionality is added to ensure the service remains in a validated state. AVM is validated and governed by documented policies and managed under a controlled development process.

The validation plan, user requirements specification (URS), and functional risk assessment for the Selenium-based automated test framework are executed and reviewed by qualified TraceLink personnel. In addition, the automated test framework itself is tested and the test scripts, results, and requirements traceability matrix are completed and reviewed by our qualified personnel.

You can view all AVM documentation for every release through the AVM interface. You also have the option to audit TraceLink online or on site. During the audit, you can review the detailed validation and quality documentation used to govern the development and management of AVM.

An audit certificate and an executive summary of the audit results and validation materials are available to review with our Regulatory and Quality Compliance organization.

AVM and PQ Validation

QUESTION 1

Can AVM satisfy my compliance requirements for doing the PQ?

Yes. AVM automates the execution of testing and provides all the test results that would normally be executed as part of the PQ.

AVM also provides additional documentation beyond the executed PQ that may be required for validation. These documents include a validation plan, URS, functional risk assessment, requirements traceability matrix, and validation summary.

> " AVM is validated and governed by documented policies and managed under a controlled development process. "

QUESTION 2

How much do I have to do to validate the Life Sciences Cloud if I don't use AVM?

Even without AVM, our customers have more access to validation documentation than what other solution partners provide. This includes all the release notes, IQ, and OQ as part of your TraceLink subscription. The PQ, however, still requires that you dedicate significant internal resources or outsource the demands that will require hundreds or even thousands of hours of PQ/UAT with each major software release. You will typically have several remaining activities to perform with each release to ensure a validated state.

You'll need a:

- ✓ Validation plan
- ✓ User requirements specification (URS)
- ✓ Functional risk assessment
- ✓ Traceability matrix
- ✓ Validation summary report

You will also need to write the PQ test scripts and execute the tests, capture the results, and include them in the traceability matrix.

QUESTION 3

Because TraceLink already provides the IQ and OQ, is TraceLink AVM just an automated PQ?

Correct validation goes beyond just the IQ, OQ, and PQ. It requires objective evidence that tests were passed successfully. All validation tasks and documents must be updated and maintained for each release of software. All this forms the basis for a traceability matrix.

As more than just an automated PQ, AVM provides every component in an easily navigable portal that provides the most comprehensive validation package available in the industry.

I'm a virtual company with no validation experience. If I use AVM, what's required of me to handle the PQ?

AVM provides nearly all of the requirements for validating the Life Sciences Cloud releases. A few basics can get you set up.

You'll need:

✓ A validation plan indicating that you will be using AVM to fulfill validation requirements.

✓ Review and approval of the plan by qualified personnel; typically, this is the person in your company responsible for your quality management system (QMS).

✓ Proper training to ensure that your staff uses the system in a documented way. This may require internal SOPs on how the TraceLink system is used. We provide training and access to our knowledge center to support these training requirements.

> " AVM provides every component in an easily navigable portal that provides the most comprehensive validation package available in the industry. "

AVM Support and Services

QUESTION 1

Is AVM available for each TraceLink software release?

Yes. AVM is executed on every major release.

QUESTION 2

How are patches addressed?

In addition to being executed against every major and compliance release, AVM is also executed against each patch release.

QUESTION 3

How does TraceLink make sure that AVM is up to date?

AVM automates the functional testing of our user interface and file transfers across all standard TraceLink maps, so you can be confident AVM is always up to date.

The TraceLink Life Sciences Cloud is built on a network-tenant platform, and AVM uses network-tenancy to deploy a single code base to all users—enabling a single automation test suite to be developed and executed.

Our validation automation team proactively assesses the impact and risk of new functionality as it is being developed. The validation tests suite continues to grow with each release—providing deeper regression testing and broader code coverage.

The full suite of automated tests is continuously executed against each release and monthly patch, and all validation documents are updated with each release to reflect new functionality. All you have to do is log in to the AVM portal and access your validation documents.

QUESTION 4

Can I download the test cases?

Yes. The deliverables and documentation included in AVM are fully accessible through a searchable web interface. The documentation can be downloaded from this portal for review and/or inclusion in your company's own internal system.

QUESTION 5

If a test fails, will TraceLink fix the code before the user sees the results?

The goal of validation is to perform exhaustive testing on each release to uncover any issues prior to production. AVM is executed against the Life Sciences Cloud test version to ensure rigorous and exhaustive system testing.

If an issue is discovered, it is triaged and addressed accordingly, based on our software development life cycle (SDLC) and escalation procedures.

One significant benefit of AVM is that it removes your burden of having to update documentation, and the results of all AVM tests are available to the user for review at any point in the SDLC.

QUESTION 6

When is AVM testing performed?

The preparation of AVM deliverables starts well before the release of the software to test. We identify the new functionality and ensure that it is properly reflected in the validation deliverables. This includes the design and writing of the automated scripts that will be used in AVM.

QUESTION 7

What visibility do I have during the validation testing?

Once the new release is deployed to test, the automated tests are executed. Results of AVM testing are not published until all of the validation tests and resulting documentation is completed.

Ready to talk about automating your validation processes?

SCHEDULE A DEMO

For additional resources, tutorials, webinars, and tips please visit us at:

TRACELINK.COM