SIEMENS
Ingenuity for life

Accelerate integrity with unified test and quality management

Business best practices

Companies around the globe face growing pressure to rapidly innovate and at the same time protect quality and functional safety. Innovation is increasingly driven by software, adding complexity and risks that need to be contained by quality assurance.

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Introduction

Microsoft® Excel® is still the most popular tool used in software testing. Not purpose-built for this task, it has many limitations. For instance, there is no opportunity to collaborate with the development team in real time, no easy way of sharing what was tested, no ability to establish a workflow between test cases, and no linking with defect tracking or requirements systems.

As a result, organizations have invested in different testing tools, especially for test automation. But their tools tend to be narrowly specialized or loosely combined suites.

Disjointed software development environments pose a wide range of disadvantages:

- Difficulty linking and tracing artifacts across differently structured repositories

- Challenge re-using artifacts across repositories, curtailing sharing across projects and teams

- Problems of low visibility into project status, impact of changes and release predictability

- Lack of a cohesive feedback loop that brings important context to every stakeholder

Real-life examples show that the best way to ensure quality in complex development environments is to use one centralized repository, while at the same time supporting integration of leading testing tools. To make this work, integrations must provide multi-directional linking functionality that delivers uncompromised traceability. Siemens PLM Software's Polarion® ALM for application lifecycle management is such a unified solution, with consistent data structures and business logic as well as integrations and open application programming interfaces (APIs) for plug-ins. It delivers benefits that competitive solutions that were integrated after the fact cannot deliver.

Our customers are able to provide one single source of truth and full transparency between teams to protect the integrity of their software components. A good example is LifeWatch, which relies on Polarion® QA™ to improve the health outcomes of millions of at-risk patients through easy-to-use health monitoring solutions. LifeWatch chose Polarion because of its unified nature, since project team members in disparate time zones needed a better, more efficient way to communicate and collaborate on projects.

Leveraging the flexibility of Siemens PLM Software's Polarion products, customers can choose from different configurations to provide all collaborators with the level of information and functionality they need, while keeping the total cost of ownership (TCO) the lowest in the industry.

In this white paper, we discuss industry best practices of Siemens PLM Software's Polarion product customers and the resulting business value they derive from using Polarion QA to unlock synergies across disparate development teams and empower all collaborators with the capabilities and information they need to accelerate integrity.

"I learned about Polarion from my team. They saw in it the kind of unified platform we needed to bridge all people around the world and get everyone everywhere on the same page."

Rafi Heumann
COO
LifeWatch

Protect quality despite ever-faster development cycles

Many quality assurance teams are driving higher test coverage to deal with ever-faster development cycles. But more mature testing organizations understand that their teams need to tightly collaborate with development counterparts earlier to stay successful.

With Polarion QA, innovative companies have proven that they can increase quality by providing testers with access to the requirements related to their testing tasks and to the authors in case of questions. Siemens PLM Software's Polarion products deliver an always-up-to-date online environment with wikis, subscriptions, live dashboards, change alerts and access-controlled threaded commenting to enable knowledge transfer.

"Polarion drastically improved the collaboration of stakeholders by tearing down the walls between organizational units and encouraging them to participate in a comprehensive product development approach."
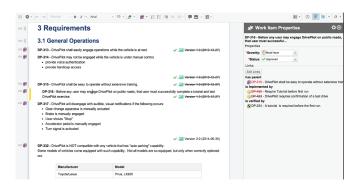
Jörn Tiedjen
LMT Lammers Medical Technology

Accelerate integrity using work items

Siemens PLM Software's Polarion product development team early on identified an opportunity to accelerate testing by uncoupling individual tasks, so that testers, developers and other stakeholders can collaborate on an itemized level.

First to introduce work items in 2005, Siemens PLM Software's Polarion products pioneered a completely new concept where those discrete artifacts can be established and managed independently from the document that contains them.
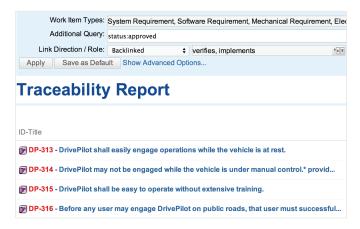
Work items are instrumental for speeding up the resolution of tasks and providing the transparency necessary to enhance quality. A typical scenario is the scheduling of work items for testing, fixes or iteration, and easy assignment to a tester. Customers report that issues are found earlier and fixed faster.

Avoid defects with comprehensive traceability

Defects can quickly become expensive, especially when recalls are required to correct them. To minimize or eliminate defects, quality assurance teams must make sure that every relevant requirement is covered by a test case.

The best way to guarantee complete test coverage is to link all test cases with the requirements they verify. This connection is easily accomplished in the Polarion products by linking all related work items. Linking test cases to requirements or other work items also enables impact analysis. Linking can be done multi-directionally inside one project, between different projects and even between different repositories.

One of Siemens PLM Software's Polarion product customers, Spansion, used to work mainly with Microsoft Excel and Word, and had two processes for each task, which was both

time-consuming and error-prone. Now the company leverages the functionality of work items to tie together requirements management, change management and test case management, and enjoys an 80 percent time reduction in traceability management while proving compliance with ISO 26262/IEC 61508 industry standards.

Of course, markets and technologies evolve, and requirements must be updated or changed. To ensure that the test cases that are related to those requirements are updated as well, testers must be notified. Polarion products support this scenario with "suspect" links. Whenever work items have auto-suspect enabled, they are automatically flagged to have suspect links whenever other linked work items change. This powerful feature supports comprehensive impact analysis across all directly linked items.
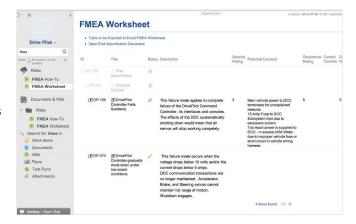
"Polarion work item level traceability support saves significant time. Before, the company invested 20 to 25 percent of project time just managing the process with Excel and Word. With the Polarion product, the traceability is achieved by pressing a button – and the time invested is reduced to five to 10 percent."

Uli Markert
Supervisor, Software Services
Spansion

Speed time-to-market with compliance

Everyone understands that quality issues slow down time-to-market. Often underestimated is how much an unsynchronized approach undermines compliance, potentially putting product launches on hold. Clearly defined processes in the Polarion software positively affect quality and are essential to achieve compliance in order to get products to market fast.

Process frameworks such as those defined by the International Standards Organization (ISO), the Food and Drug Administration (FDA) and the International Electrotechnical

Commission (IEC), combined with Capability Maturity Model Integration (CMMI) guidelines describe the particular processes that must be managed. The Polarion products provide worksheets to help companies comply with strict regulations and standards and follow consistent processes that can be presented to auditors. With its integrated workflows, compliance can be assured by demonstrating that steps cannot be missed or bypassed, even at crunch time.

One of Siemens PLM Software's customers especially eager to take advantage of this functionality is the U.S. Federal Aviation Administration (FAA), the national aviation authority that regulates and oversees all aspects of civilian aviation in the U.S. A development group within the FAA adopted Polarion as their application lifecycle management solution.

"Right now, we need compliance with only a fairly low level of DO-278. With the Polarion product, we can easily ramp up to higher levels, and as standards evolve and change over time, it will be much easier for us to adapt."

Group Configuration and Verification Manager
FAA

Recognizing that many organizations continue to use Microsoft Excel in their testing environment, Polarion products also offer a robust integration to import existing Excel-based test data so it can be edited, tracked, and executed with full version control and none of the limitations of Excel.

Another great benefit of Polarion is that collaborators aren't required to know the whole process. They can simply follow clearly defined workflow steps and perform assigned tests or other tasks and mark the new status. Advancement to the next workflow step happens automatically, everyone who needs to know is notified, and an audit trail is automatically recorded for compliance.

Siemens PLM Software customer Swisslog leveraged this functionality, implementing its own development workflow. The intuitive web user interface and the customizable workflows for different user roles significantly reduced the learning curve within the rollout, so that the first productivity and quality improvements were apparent very shortly after implementation.

"With Polarion, we've been able to implement our worldwide, distributed development processes to achieve our quality standards and CMMI compliance."

Tim Eick
VP Software and Control Development
Swisslog

Track progress in real time

Of course, quality management is not complete without reporting. Polarion QA includes powerful reporting tools that accommodate any possible need. On the granular level are lists of all test cases and their specific results, and on a higher level are overviews of the number of test cases executed, passed or failed. Polarion QA helps customers get started quickly with test run templates and corresponding reports that can be quickly customized.

Having all the data in a single repository makes robust reporting easy, and Polarion QA provides an advanced level of information for all roles, from C-level directors, to project managers and individual developers. Polarion can produce a report for any moment in an object's history, providing

reporting capability for any revision, leveraging the unified, versioned repository with all historical data.

Since many customers have other reporting solutions that they need to connect to Polarion products for unified and versioned storage, Siemens PLM Software developed an integration with Business Intelligence and Reporting Tools (BIRT) open source visualization technology to showcase how easy third-party integration is.

Last but not least, as a true web-based solution Polarion products end the need to distribute reports via email. Instead, customers can simply send a URL leading to an online report that always presents up-to-date information. Of course, users can still export reports to PDF for external stakeholders.

Leverage existing tools to reduce total cost of ownership

Many organizations have automated testing tools and want to import results from these tools into their Polarion product environment with links to requirements and other test cases. This data import can be easily achieved, providing improved transparency along with automatic history of all testing activities.

With Siemens PLM Software's Polarion products, customers know that they don't waste tight budgets on costly point solutions and consultants to make them work together. They get one unified, collaborative, browser-based platform that can be implemented in weeks, not months. The unified platform along with fully integrated functionality of specialized tools helps achieve compliance while reducing total cost of ownership every day.

"With Siemens PLM Software's Polarion products, it is the first time that the entire spectrum of development activities is covered by one tool. This allows closer collaboration between software, hardware, mechanical, project management, test and requirements management which improves the product quality and saves time and money."

Rainer Kirchner
Team Leader Project Support
ASK Industries

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