Cardinal Health Enhances Trust in Products, Services, and Processes with Automated Regression Testing and Robotic Process Automation

by **Ken Murphy,** Editorial Director

The breadth of services and products that Cardinal Health, Inc. delivers to the healthcare industry is enormous. Based in Dublin, Ohio, the $137 billion global integrated healthcare services and products company services more than 26,000 pharmacies and has products in nearly 85% of US hospitals. Its 45,000 home healthcare products are used by nearly three million patients, and an additional 53,000 laboratory products are delivered to over 6,700 labs. The business also provides products and services to ambulatory surgery centers and physician offices worldwide. With this staggering number of offerings that patients are counting on — oftentimes with lives at stake — the business needs to maintain operational excellence every single day.

In 2006, Cardinal Health embarked on a long-term strategy to transition business functions and business units onto SAP software, beginning with SAP ERP Financials — specifically to implement the end-to-end order-to-cash and procure-to-pay processes. According to Greg Boggs, Vice President of Software Engineering at Cardinal Health, the company runs several SAP instances integrated with roughly 1,000 SAP and non-SAP applications across various business units. "Our large transactional volumes tend to stretch

At a Glance

Goals: Reduce cost structure around application support and maintenance; adopt a more reliable and impactful automation solution for business process testing; and use continuous regression testing and robotic process automation (RPA) to support a continuous integration and development strategy

Strategy: Implement Worksoft Certify and Worksoft Analyze to institute end-to-end regression test automation, continuous test execution, and RPA capabilities

Outcome: A 40% reduction in automation maintenance; 60% reduction in regression test execution time; automation coverage up to 90% in sprint cycles; up to 85% reduction in mass configuration efforts through RPA; and more than 50% reduction in application support costs

or break most software companies' software," Boggs says. "But thousands of patients depend on us every day to provide the products and services they need, and we depend on reliable processes to produce those daily shipments."

Upholding stringent reliability standards requires dependable regression testing of business processes. For some time, Cardinal Health's regression testing processes consisted of unintegrated automation tools combined with manual efforts. With its landscape under active change at any given time, the level of effort to maintain the automation solutions often meant more time-consuming manual efforts, testing later in a project life cycle than desired, and a lower percentage of automation coverage.

According to Nikhil Shah, Director of Software Engineering at Cardinal Health, increased maintenance became unsustainable. "Without a solid way of integrating automation along with the application changes, the maintenance has the potential to fall behind and, at some point, you can't rely on automated testing to help deliver testing services," he says. "And if you offset that with manual work, you can introduce risk."

To avoid this risk, as well as improve service levels and lower costs, the business needed to renew its approach to automated business process testing.

A Culture of Automation

In 2016, Boggs, Shah, and the software engineering team built a business case to reduce its cost structure around application support and maintenance, while also embracing Agile, DevOps, and hyper-automation techniques. As part of this business case, the team included a more cost-effective and more reliable automation solution for business process testing.

Of roughly 6,000 end-to-end business process scenarios, Cardinal Health was mostly focused on testing processes that involve the receipt of goods and services, including procure-to-pay and order-to-cash processes. "There are many ways customers can place an order, and we make sure that all of those processes are tested thoroughly from the time an order is placed to when we pick, pack, and ship, send out an invoice, and receive cash," Shah says.

After looking at several automated testing solutions, Cardinal Health opted for long-time SAP partner and industry leader Worksoft as the provider that best met its requirements. The selected software product, Worksoft Certify, offered end-to-end business process testing across the organization's enterprise SAP and non-SAP application landscape, as well as seamless integration, lower maintenance, and ease of use.

According to Boggs, the Worksoft Certify suite checked all the requirement boxes due to its capabilities for automated regression testing, risk analysis, and large-scale test execution to

Cardinal Health, Inc.

Headquarters: Dublin, Ohio

Industry: Healthcare services and products

Employees: 50,000 approximately

Revenue: $137 billion (2018)

Company details:

• Serves nearly three million patients with 45,000+ home healthcare products
• Serves 6,700+ laboratories with 53,000+ products
• Services 26,000 pharmacies
• No. 14 on Fortune 500
• www.cardinalhealth.com; NYSE: CAH

SAP solutions: SAP ERP, SAP S/4HANA, SAP Enterprise Portal, SAP Fiori, SAP Customer Relationship Management, SAP Advanced Planning and Optimization, SAP Integrated Business Planning, SAP Global Trade Services, SAP Ariba, SAP Concur, and SAP solutions for governance, risk, and compliance

Third-party solutions: Worksoft Certify and Worksoft Analyze

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enable continuous integration and development — as well as its easy integration with the Worksoft Analyze solution, which the business also adopted, for automated business process discovery, documentation, and test creation. Worksoft Certify is an automated codeless testing solution built specifically for non-technical users to test end-to-end complex business processes that span multiple applications and integrate into modern-day DevOps tool chains. The solution is complemented by Worksoft Analyze, which enables users to discover, define, and document end-to-end business processes and import them as test scripts into Worksoft Certify to jumpstart and expedite test automation.

The combination of these two solutions would allow Cardinal Health to pursue another key objective of making testing more of a company-wide initiative, especially as it transitions to a DevOps release deployment, a focus of the Testing Center of Excellence (TCoE) team that was designated for the key projects that affect mission-critical applications. "A big push right now is to make automation everyone's job," Boggs says. "Part of what we're doing in learning how to automate faster is using Worksoft Certify and Worksoft Analyze to extend testing to different roles to further build out automation, involving people who haven't before viewed themselves as active participants in test automation."

At a high level, Worksoft's object and action recognition capture technology documents users' actions when they are executing business processes. Captured objects can then be displayed in an output report for analysis, which the TCoE team can use to determine whether there is room for business process optimization. Hardening automation around a process — whether through more data, validation, or end-to-end testing — allows for lights-out, continuous testing capabilities and fewer manual workarounds.

Having more people involved in testing, Boggs says, will extend the value of test automation across the organization by also allowing the TCoE team to begin testing earlier in a project life cycle than previous technology allowed. "Whether it's business users, business analysts, functional SAP consultants, or others, we're getting resources involved in the process that we weren't able to previously."

Continuous Integration and Development and Robotic Process Automation (RPA)

Extending test automation to a larger team of users and analysts, building continuous automated testing capability, and beginning testing earlier in a project life cycle all fall under Cardinal Health's chief objectives for pursuing more rigorous automated regression testing and adopting a culture of continuous integration and development.

Having numerous stakeholders invested in the project's success paid even more dividends when Cardinal Health leveraged Worksoft functionality to extend robotic process automation (RPA) by setting up mass configuration activities, reducing those activities by as much as 85% and in several cases leading to the automation of many low-value activities to save hundreds of hours of manual effort.

For repetitive activities involving standard SAP objects and functions, repetitive data is fed into Worksoft, and the application then handles the log-in of the standard transaction screen. While users are still providing the input and security credentials, Worksoft's RPA functionality saves a multitude of keystrokes during a mass configuration, whether it's running a report, making an update, setting up company codes, or setting up multiple plants.

"That was a pleasant surprise and wasn't initially on our radar," Boggs says. "Having RPA capabilities for business users to use up front as part of a day-to-day process really gets our larger IT and business community excited about using the technology to not only test faster but also complete business processes faster."

The ease of use of the technology played a big role in achieving unexpected value from Worksoft's RPA capabilities, according to Boggs. "Previously, the automation journey seemed very specialized and off-putting to a general user," he says. "Now, we see a lot of team members participating in the journey and developing multi-skill profiles that give us more of an agile team."

Automating repetitive activity, including RPA scenarios and enhanced automation for the full regression test suite, has led to a roughly 60% reduction of the time it takes to go to market with new functionality. With shortened release testing cycle times, Cardinal Health can now conduct up to 600 tests in less than an hour, which was not possible with its previous testing technology. Across all its major platforms, regression test execution time is down by up to 60%.

"One way we will measure or quantify these benefits is by our ability to move changes into the next environment," Boggs says. "So perhaps you're moving from Dev to QA, and you will know each day whether the change you make is good or bad. With continuous test execution, instead of waiting for a traditional testing cycle, you know right away whether or not the change was effective."

Automation Will Be a Core Service Offering

Moving forward, Cardinal Health plans to extend its use of Worksoft solutions. The business will continue to build on existing efficiencies by leveraging the software's functionality for risk-based testing, implementing automated API testing, and empowering business users by providing training on self-service automation capabilities. "Our vision is to expand automation as a core service offering embedded into the overall solution delivery process agnostic to methodology or technology," says Boggs. ∎