ASDI Inc., Longmont, CO

"ASDI Inc. (now Malvern-Panalytical Inc.) engaged Rhoynar's services for test automation and CI/CD solutions for our Firmware Software Platform development. It is difficult to find a technically competent team providing embedded software testing and CI/CD solution - and Rhoynar team provided just that expertise and delivered the project exceeding all our expectations"

- Eric Roberts, Product Manager, ASDI Inc., Longmont, CO

Business Challenges:

ASDI Inc., (now Malvern Panalytical Inc.) develops scientific embedded instruments for Spectro-Radiometric analysis to Universities and Research Institutions around the world. FieldSpec5 is their flagship product for 2018 which uses a wholly new architecture, better processors and sensors.

ASDI, Inc., engaged Rhoynar's services to develop embedded software automation framework for the Field Spec firmware. Current Firmware codebase had a few unit test cases, but no end-to-end automation test cases.

Rhoynar's 3 month engagement project resulted in 4 different automation frameworks for Field Spec devices (for Firmware, REST APIs, Instrument Website and Instrument Mobile Application). All frameworks are seamlessly integrated on Jenkins CI system providing a continuous testing solution.

Results:

Rhoynar team was engaged in a 3 month project with Malvern Panalytical where in we developed multiple automation frameworks for different parts of the ASDI software. These automation frameworks were designed for Instrument Firmware APIs, REST APIs, Instrument website and Instrument mobile application.

All the frameworks used Python and BDD based architecture - thereby leveraging common libraries and design patterns across the different frameworks.

A CI system comprising of Jenkins and BDD Test reporting was also developed and installed on site. The FieldSpec team now has a reliable solution for testing all software developed internally.

RHOYNAR SOFTWARE
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Project Details:

ASDI Inc. engaged Rhoynar's services as a external development partner for building automation frameworks for their embedded Software. Since this is an Embedded device featuring multiple different software components - Rhoynar team broke down the problem into different automation frameworks for different modules. We developed an automation testing framework for Embedded Firmware which deals with the actual sensors and collection; another automation framework (Selenium based) for instrument website; and a third automation framework for the Mobile Application testing (Appium based). Over the course of 3 months, we worked with internal technical team in an Agile-Scrum manner and produced demonstrable deliverables each Sprint - collected feedback from internal teams - and refined upon our deliverables. This engagement resulted in multiple other engagements with ASDI - and also excellent references for different external companies. Below were some of the salient features of the Automation Frameworks.

- **Embedded Firmware REST APIs test framework**: The instrument exposed few REST APIs that allowed external entities to access the instrument. This automation framework focused on testing the REST APIs (functional and performance). We used Python, BDD (Python Behave package), Python Requests package to develop this test framework.
- **Embedded Firmware Legacy API test framework:** The instrument supported few legacy message based APIs - and there was a need to maintain support for legacy APIs due to backward compatibility. This framework completed automated legacy API testing with close to 1000 end-to-end test scenarios covering all possible use cases of the legacy APIs. Python was again used for developing a test framework.
- **A GUI Test Runner for Test Cases:** Rhoynar team also developed a GUI based Test Runner which could automatically discover Python PyTest/UnitTest test cases in a directory and allow to run the test cases - either individually or as part of a suite of test cases. After a test case is run, the GUI would show whether is passed or failed, and displayed test results and logs in a display window on the GUI. Python, UnitTest, TkInter were used to develop the GUI test Framework.
- **Embedded Instrument Website Test Framework:** Rhoynar team was also engaged to develop a Angular Web-Application for instrument configuration and calibration, and a corresponding automation test framework involving Python, Selenium and BDD was developed to test the same. The test framework has close to 200 BDD scenario for instrument website and used Page Object design pattern to simplify test maintenance.
- **Embedded Instrument Mobile Application Test Framework**: FieldSpec instrument also provided support for a Mobile Application that was created to control the Embedded instrument. Rhoynar team was engaged to develop a Automation Test Framework for the mobile application. We completed this by using Python, Appium with WinAppDriver. We integrated BDD scenario based testing - which allowed us to create close to 200 scenarios for different functional use-cases of the Mobile Application.
- **Continuous Integration**: One of the key features of all test frameworks was complete CI integration for the test suites using Jenkins. This allowed test cases to be run on a nightly basis and on any check-in triggers.

Technologies Used:

Our Guarantee:

At Rhoynar, we believe in providing honest and exemplary customer service to our clients. We understand that the client may have hesitations in employing any consulting company for any internal project. *Will the solution meet all our needs? Do they really have the expertise and experience in delivering this solution? What if it is not extensible and requires constant upkeep? Will adequate training be provided to our staff after the project is over? What if the technologies they use become obsolete? Will they consultant have enough expertise in the said domains?*

We are confident that you would be absolutely delighted by our experienced team: they will use the latest technologies and come up with a robust and extendible solution in record time. They will perform a graceful handover of the project with ample continuous training sessions, documents and specifications and training videos. Our team will respond immediately if there are any questions, issues or bugs found during and after the project.

Conclusions:

The Automation frameworks developed by Rhoynar highlight our ability to work with diverse Software requirements. We built test automation platforms for different platforms: embedded software, Selenium/Appium based, and REST APIs based frameworks. As usual with our other projects - all frameworks are highly robust, maintainable and follow the best design practices for Automation.

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